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GUEST EDITORS: JAMES L. RUDOLPH, MD, SM; MRIGANKA SINGH, MD

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RHODE ISLAND MEDICAL JOURNAL

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SPECIAL SECTION

Geriatric Medicine & Care

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GUEST EDITORS

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Geriatric Medicine: Treatises on Assessment of Function

JAMES L. RUDOLPH, MD, SM
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GUEST EDITORS

Every man desires to live long, but no man wishes to be old.[1]
—Jonathan Swift

Some 80-year-olds run marathons, some are bedbound with advanced dementia, and half the cohort has already died. From the dawn of time, age has been reported as a chronologic, continuous number. This focus on chronology becomes problematic with advancing age because people become more heterogeneous. As clinicians in a modern medical world, we should expand our definition of aging beyond chronology. In this issue of the *Rhode Island Medical Journal* (RIMJ), we present a series of protocols from across the spectrum of healthcare settings – each paper highlights that assessment of function is critical. Taken together, these articles represent the broader accord (treatises) within the geriatric literature: that function should be used as the measure of aging to accurately identify risk and engage in shared decision-making with patients and caregivers.

RECONCEPTUALIZING FUNCTION

Function is broadly defined as the ability to engage and thrive in the world. While function is often focused on specific tasks, such as working, driving, preparing a meal, or eating, the term can be better conceptualized as performance on a spectrum of physical, cognitive, and social abilities. For example, the spectrum of physical function spans transferring from bed-to-chair to running a race. Cognitive function might include being able to add a new medication to a current regimen or taking pills which have been placed in a pillbox. The social-function spectrum might include employment or attending social events. The field of geriatrics has long used function as a metric for risk assessment, measurement of decline, engagement of supportive services, placement in nursing facilities, and enrollment in hospice.

The interplay of physical, psychological, and social function complicates a single, standardized scale for function. For example, the degree of recovery from a hip fracture is dependent on pre-fracture function, avoidance of delirium, early engagement in therapy, and the social/financial structure to support ongoing therapy beyond the hospital. Poorly functioning individuals can recover from a hip fracture if there is early therapy and the social structure to support continual rehabilitation. Conversely, a highly functioning person who develops delirium is less likely to engage in therapy and may struggle to recover without social supports. Geriatric co-management services support those who are undergoing major, short-term stressors (i.e., oncology, neurosurgery, orthopedic trauma, etc.) to improve long-term functional recovery.

RI GERIATRIC SERVICES, RESEARCH CENTERS

This issue of RIMJ highlights the importance of function, and Rhode Island's eminence in research and clinical care related to function. Each of the health systems in Rhode Island (See **Box 1**) has a robust geriatrics service, with tailored co-management programs for high-risk patients at high-risk times. The Rhode Island Geriatric Workforce Enhancement Program, based at the University of Rhode Island, has partnered with organizations to build a workforce that meets the needs of Rhode Island elders. At the Brown University School of Public Health's Center for Gerontology and Health Services Research and Center for Long Term Care Quality and Innovation, international leaders of nursing home quality measurement and improvement have been driving innovative pragmatic trials through the IMPACT Collaboratory. The Care New England Memory and Aging Center, Brown's Carney Institute for Brain Science, and the Providence VA's Center of Innovation in Long Term Services and Supports are conducting cutting-edge research.

CARING FOR AN AGING POPULATION

Since its founding in 1776, Rhode Island has witnessed the ebbs and flows of age. Rhode Island ranks 14th in population age,[2] 3rd in long-term care beds per capita (787 per 100,000),[2,3] and 10th in geriatricians per capita (2.9 per 100,000).[4] It is poised to accept the challenge of caring for an aging population. Although clinical care, education, and research infrastructures are in place, a focus on building connectivity across the existing infrastructures to the physical, cognitive, and social functional needs of elders is critical – for example, connecting individuals receiving Meals on Wheels with social services for transportation to clinical visits and volunteer visitors. Broader infrastructure investments in transportation, housing, and home-based services can pay dividends to maintain functioning in home environments.

Rhode Island has an opportunity to implement the physical and social infrastructure to promote the home-based focus that would allow RI to become an Age-Friendly State.

While time will continue its march, our thinking about aging need not stagnate – abundant evidence, both pragmatic and scientific, documents that assessment and management of function during high-stress events (e.g., acute illness, surgery, social instability, etc.) can improve the short- and long-term outcomes for the people of Rhode Island.

Box 1. Rhode Island Programs Focused on Aging Care, Education, and Research

Clinical
Brown Division of Geriatrics and Palliative Medicine
Care New England Division of Geriatrics
Lifespan Geriatrics
Hope Hospice
Program for all inclusive care of the elderly (PACE-RI)
Rhode Island Health Center Association (Federally Qualified Health Centers of RI)
Education
University of Rhode Island Geriatric Education Center
Research Centers
Brown University School of Public Health
Center for Gerontology and Health Services Research
Center for Long-Term Care Quality and Improvement
Carney Institute for Brain Science
Center for Alzheimer's Disease Research
Providence VAMC Center of Innovation in Long Term Services and Supports
Lifespan Center for Stem Cells and Aging
Home & Community-based Services
State of Rhode Island
RI Office of Healthy Aging
Access (POINT offices)
Connect (Caregiving, nutrition, housing, legal, home care and transportation supports)
Protect (Protective Services, guardianship, ombudsman)
RI Executive Office of Health and Human Services Older Adults
Rhode Island Community Resources
Age-Friendly RI
Alzheimer's Association
LeadingAge RI
Rhode Island Partnership for Home Care
Regional Non-Profit Programs for Aging in Place
Child & Family Elder Services RI
East Bay Community Action Programs Senior Services
Independent Aging Services
Jewish Alliance RI Senior Services
Saint Elizabeth Community Services & Care
Senior Services RI

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Distribution of Adult Day Health Centers and Persons Living with Dementia Among Hospital Service Areas in Rhode Island

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ABSTRACT

INTRODUCTION: Adult day health centers (ADHCs) provide an important service to community-dwelling adults with functional dependency. This includes persons living with dementia (PLWD) and their caregivers, but we don't know how well ADHC capacity matches the distribution of PLWD.

METHODS: For this cross-sectional study, we identified community-dwelling PLWD using Medicare claims, and ADHC capacity using licensure data. We aggregated both features by Hospital Service Area. By linear regression, we determined the association between ADHC capacity and community-dwelling PLWD.

RESULTS: We identified 3836 community-dwelling Medicare beneficiaries living with dementia. We included 28 ADHCs, with licensed capacity for 2127 clients. The linear regression coefficient (95% Confidence Interval) for number of community-dwelling beneficiaries with dementia was 1.07 (0.6–1.53).

DISCUSSION: Rhode Island's ADHC capacity distribution roughly approximates the distribution of persons with dementia. Plans for the future of dementia care in Rhode Island should consider these findings.

KEYWORDS: adult day health centers; dementia; distribution

INTRODUCTION

More than 11 million Americans provide unpaid care to a person living with dementia, and most report that this causes them a high level of stress.[1] These caregivers, usually a family member of the person with dementia, often balance competing demands of paid employment with their unpaid caregiving.[2] Several high-quality studies have demonstrated that distress in dementia caregivers is associated with higher rates of institutionalization, behavioral symptoms, and abuse of the person with dementia.[3] Dementia caregivers can also suffer negative health consequences from this distress. Most dementia caregivers report feeling concerned about maintaining their own health after becoming a caregiver, and many report delaying or not doing things for their own health.[1,4] Adult day health centers are one type of program to help alleviate these caregiver challenges by providing respite where a substitute care provider provides temporary caregiving to a person with dementia.

Adult day health centers provide for social, safety, nutritional, and potentially other needs of community-dwelling adults with functional dependencies. Persons with dementia benefit from this service as well as their caregivers.[5] Adult day health centers provide service during the day, allowing their clients to continue to dwell in the community while receiving the service. The person living with dementia can spend time in a safe and supportive environment while the caregiver spends time away from caregiving. Adult day health center participation may improve quality of life in both physical and emotional domains for persons living with dementia.[6] Caregivers of adult day health center users with dementia report lower frequency of behavior problems and less time spent on behavior problems than caregivers of non-users with dementia.[7] Adult day health center participation also helps dementia caregivers complete important self-care tasks such as attending their own medical appointments.[8] Availability of adult day health centers benefits both members of the patient-caregiver dyad, and may also help health systems by delaying or substituting for more expensive forms of care such as long-term nursing home care.[5]

Adult day health centers predominantly rely on public sources of participant fees such as state Medicaid programs for financial viability. Private sources of participant fees including individual payments and health plan payments also contribute substantially.[9] Most states, including Rhode Island, require adult day health centers to undergo certification and licensing.[9–11] Rhode Island regulations require centers offering special care service for clients with Alzheimer's dementia or other dementias to offer standard disclosures.[11] These disclosures include the program philosophy, information about the processes of care, program costs, and the process of termination. However, the regulation does not clearly define a level of dementia severity at which the rule applies, leaving interpretation to the centers and to the state department of health.

Access to adult day health centers by Rhode Islanders living with dementia and their caregivers relies in part on the geographic distribution of licensed adult day center capacity within the state. Per state regulations, adult day health

centers should encourage families of participants to arrange their own transportation whenever possible.[11] Therefore, the geographic distribution of licensed adult day center capacity would ideally mirror the distribution of potential service users in the state. The Hospital Service Areas construct divides the United States into a set of clearly defined geographic areas which approximate local markets for healthcare. After reviewing abstracts and articles retrieved via relevant search terms on PubMed, we did not identify any studies comparing the geographic distribution of persons living with dementia to the geographic distribution of adult day health centers in Rhode Island. This study will compare the distribution of community- dwelling persons living with dementia by Hospital Service Area within the State of Rhode Island to the distribution of licensed adult day health center capacity.

METHODS

We completed a cross-sectional ecological study using Medicare claims and publicly available data on licensed adult day center capacity from the Rhode Island Department of Health. The use of the secondary Centers for Medicare and Medicaid Services data was reviewed and approved by the Brown University Institutional Review Board, and the Rhode Island Department of Health data was public use and exempt from IRB review. The sample of Medicare beneficiaries included 100% of beneficiaries, ages 65 and older, enrolled in Medicare parts A and B (traditional fee-for-service Medicare) or Medicare part C (Medicare Advantage) who were alive and residing in Rhode Island on January 1, 2020. We used our Residential History File[12] methodology to exclude beneficiaries who were not community dwelling as of January 1, 2020. We used the Medicare Master Beneficiary Summary File to determine the zip code of residence as of January 1, 2020. We then grouped beneficiaries by Hospital Service Area using the methodology published by The Dartmouth Atlas of Healthcare. Hospital service areas represent local health care markets.[13,14] Using the Master Beneficiary Summary File, we considered any individual who satisfied the Chronic Conditions Warehouse criteria for either Alzheimer's disease[15] or non-Alzheimer's Dementia[16] to be a person living with dementia. The updated 30-chronic condition segment algorithms use a 2-year reference period for Medicare claims identifying dementia. We used the qualifying claim period ending January 1, 2020, to reduce the impact of underutilization of routine healthcare during the Severe Acute Respiratory Syndrome Coronavirus 2019 pandemic on our results. We also used the Master Beneficiary Summary File to determine the age, race, sex, and Medicaid eligibility of beneficiaries within each Hospital Service Area.

We obtained the address and licensed capacity of each operating adult day health center in Rhode Island as of October 2022. We excluded 6 licensed centers whose original date of licensure occurred after January 1, 2020 with the aim of temporally aligning this measurement with our sample of beneficiaries with dementia. Because only 2 of the licensed centers reported special licensure for Alzheimer's Dementia and other dementias, we included all licensed centers. We used the zip codes and licensed capacities of the adult day health centers to determine the licensed capacity within each Hospital Service Area.[14]

For the primary analysis, we fit a linear regression model of licensed adult day health center capacity as a function of the number of community-dwelling Medicare beneficiaries living with dementia in each Hospital Service Area. We used R version 4.4.1 (The R Foundation for Statistical Computing, Vienna, Austria) for the regression analysis. To test the sensitivity of our result to inclusion of adult day health centers licensed after January 1st 2021, we repeated the primary analysis including all of the operating adult day health centers that were licensed as of October 2022. As an exploratory analysis, we visually assessed the distribution of adult day health centers within and between Health Service Areas by geocoding the location of each center and projecting its location on a map of the Health Service Area boundaries using ArcGIS online (Esri, Redlands, CA).

RESULTS

We identified 3836 community-dwelling Medicare beneficiaries living with dementia. In the overall sample, 2,926 (76.3%) were in the age range of 75 to 94 years old (**Table 1**). We included 28 adult day health centers, which were distributed between 5 Hospital Service Areas. (**Table 2**). The included centers had licensed capacity for a total of 2127 clients. The adult day health centers that we excluded due to initial licensure after January 1, 2020 had a total capacity of 580 and 2 of these centers were located in Hospital Service

Table 1. Sample Characteristics

Characteristic	No. (%) (n = 3836)
Age	
65–74	590 (15.4)
75–84	1435 (37.4)
85–94	1491 (38.9)
95+	320 (8.3)
Race	
White	3431 (89.4)
Black	86 (2.2)
Hispanic	210 (5.5)
Other	109 (2.8)
Male	1476 (38.5)
Eligible for Medicaid	479 (12.49)
Enrolled in Medicare A and B	3416 (89.1)

Areas without any other licensed adult day centers. Only 2 centers, both of which were licensed before 2020, were specifically licensed for Alzheimer's Dementia or Other Dementia Special Care Services. One was located in the Providence Hospital Service Area and licensed for 65 participants, and one was located in the Warwick Hospital Service Area and licensed for 80 participants.

In our linear regression model for the licensed adult day center capacity per Health Service Area, the coefficient (95% Confidence Interval) for the number of community dwelling beneficiaries with dementia was 1.07 (0.61–1.53). In our sensitivity analysis, the coefficient (95% Confidence Interval) for the number of community dwelling beneficiaries with dementia was 1.20 (0.70–1.71). Our map demonstrates that most of the licensed adult day health centers are centrally located in the state (**Figure 1**), and located near population centers (**Figure 2**).

Table 2. Comparison of beneficiaries with dementia and licensed adult day center capacity by Health Service Area.

Health Service Area	Beneficiaries No. (%) (n = 3836)	Licensed Adult Day Center Capacity No. (%) (n = 2127)
Fall River[a]	130 (3.4)	0
Newport	316 (8.2)	0
Pawtucket	194 (5.1)	110
Providence[a]	1569 (40.9)	1665
Wakefield	326 (8.5)	0
Warwick	814 (21.2)	140
Westerlya	177 (4.6)	46
Woonsocket[a]	310 (8.1)	166

[a] These Health Service Areas overlap state boundaries, and only the portion in Rhode Island is included.

DISCUSSION

We found that Hospital Service Areas had an average increase in licensed adult day center capacity of about 1 for each additional community-dwelling person with dementia. This implies that at the geographic level of Hospital Service Areas, the distribution of adult day health centers is well-matched to the distribution of community-dwelling persons

Figure 1. Distribution of adult day health centers in Rhode island, by Hospital Service Area. Black squares and circles represent adult day health centers licensed before January, 2020; with and without special Alzheimer's Dementia or Other Dementia Special Care Services, respectively. Black diamonds represent adult day health centers with initial licensure between January, 2020 and October, 2022. Color-shaded areas represent Health Services Areas, as defined by the Dartmouth Atlas of Healthcare.

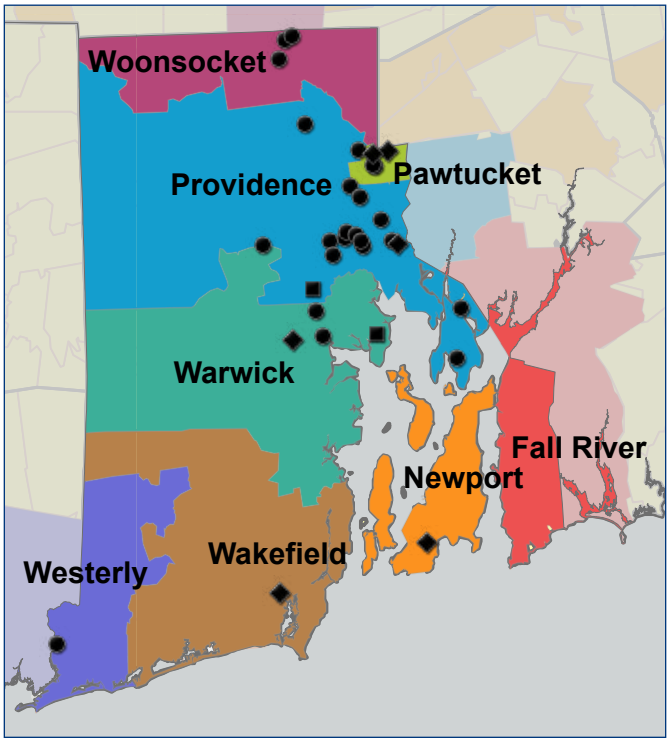
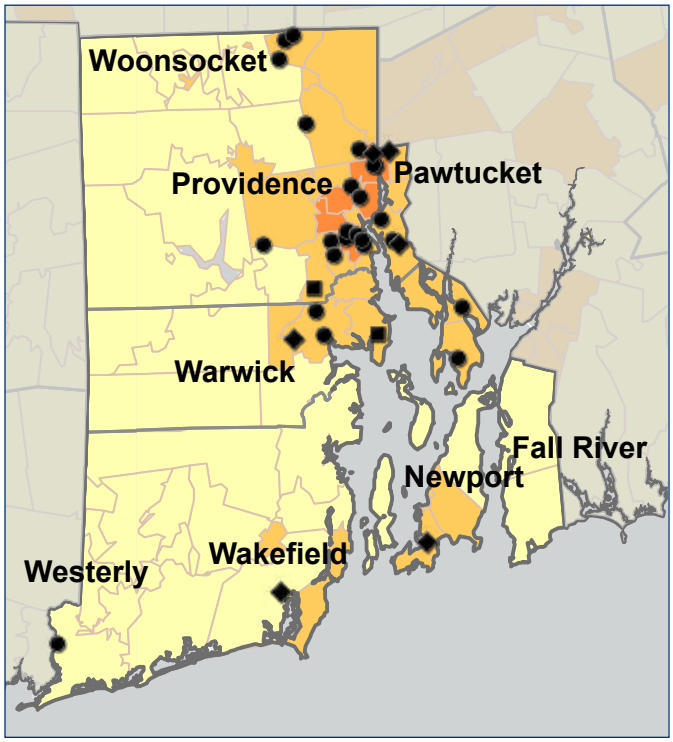


Figure 2. Distribution of adult day health centers in Rhode island, by Hospital Service Area. Black squares and circles represent adult day health centers licensed before January, 2020; with and without special Alzheimer's Dementia or Other Dementia Special Care Services, respectively. Black diamonds represent adult day health centers with initial licensure between January, 2020 and October, 2022. Background map shading represents population density based on the 2020 United States census.



living with dementia. Our sensitivity analysis examined this distribution including the adult day health centers licensed between January 2020 and October 2022, assuming that the distribution of persons living with dementia did not change. Here, we found that licensed capacity expanded in hospital service areas which did not previously contain adult day health centers. The overall distribution of centers remained well matched to the distribution of community-dwelling persons living with dementia at the Hospital Service Area geographic level. By plotting the locations of the licensed adult day health centers on a map, we found that most of their capacity was clustered in central and more populous areas of the state. This implies that persons in rural areas of the state would generally need to travel further than persons in the state's urban centers. Public and facility-provided transportation could overcome this geographic barrier. Our study did not examine the ways that existing transportation programs serve the needs of rural persons with dementia.

A study of dementia care capacity in Ireland found a much lower rate of about 17 'dementia places' per 100 persons with dementia.[17] This study used survey methods rather than licensure information to determine adult day center capacity. For estimates of dementia prevalence, the study relied on application of data from multiple international studies to the results of the 2016 Irish census, rather than healthcare claims. The study only included the 77% of responding adult day centers stating that they accepted participants with dementia. In contrast, only 2 (7%) of included Rhode Island adult day health centers had special licensure for dementia care, so we included all licensed centers. Had we restricted our sample to specially licensed centers, our overall capacity would have been much lower than that in the Irish study – about 3.7 per 100 persons with dementia. Our use of claims to estimate the prevalence of dementia is more robust than extrapolation of prevalence data from other populations. Our study is the first that we know of examining the distribution of adult day health service centers in the United States and comparing this to the distribution of community-dwelling persons living with dementia.

Limitations

Our study has several limitations. Our use of Medicare claims to identify persons with dementia would not identify those not enrolled in Medicare or Medicare beneficiaries in whom dementia was not identified in a claim. Also, our analysis does not account for the geographic distribution of other populations of people likely to benefit from adult day health centers, such as persons with developmental and intellectual disabilities. Because we made comparisons at the level of the Hospital Service Area, our quantitative analysis would not detect maldistribution of centers within Hospital Service Areas. The Hospital Service Area construct uses geographic patterns of hospital utilization to define local healthcare markets, therefore we considered this a reasonable unit of analysis for our research question. We also did not analyze other factors involved in adult day center availability such as payment considerations, availability and limitations of public or center-provided transportation, and length of waiting times for service enrollment.

CONCLUSION

Among Hospital Service Areas in Rhode Island, adult day health centers are distributed roughly according to the number of community-dwelling Medicare beneficiaries living with dementia. Within Hospital Service Areas, the same adult day health centers are clustered in population centers, a potential barrier to access for rural residents. These results may have relevance to public officials, policymakers, and health systems in the State of Rhode Island. Clearer regulations regarding the role of adult day health centers in the care of persons with mild dementia would facilitate greater precision in assessing the adequacy of the current care infrastructure. This study's approach may interest concerned parties in other jurisdictions who seek an equitable approach to licensure and financing of adult day health centers and other critical community health resources. Rhode Island's adult day health centers capacity is distributed between healthcare markets in a manner that roughly approximates the distribution of persons with dementia. Plans for the future of dementia care in Rhode Island should consider these findings.

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Assessment of Frailty and Risk of Chemotherapy Toxicity at a Geriatric-Oncology Multidisciplinary Clinic

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ABSTRACT

BACKGROUND: Multidisciplinary Geriatric-Oncology (GO-MDC) clinic performed comprehensive geriatric assessment (CGA) to determine frailty and chemotherapy toxicity risk.

METHOD: Retrospective cohort study of patients ≥65 years seen between April 2017 to March 2022. We compared Eastern Cooperative Oncology Group-Performance Status (ECOG-PS) to CGA as a determinant of frailty and risk of toxicity from chemotherapy.

RESULTS: Mean age of the 66 patients was 79 years. Eighty-five percent were Caucasian. Predominant cancers were breast (30%), and gynecological (26%). One-third were stage 4. The CGA identified fit (35%), vulnerable (48%), and frail (17%) patients whereas ECOG-PS classified 80% as fit. CGA assessed 57% of ECOG-fit patients as vulnerable or frail ($p<0.001$). High chemotherapy toxicity risk using CGA was 41% and using ECOG was 17% ($p=0.002$).

CONCLUSION: At GO-MDC, CGA was a better predictor of frailty and toxicity risk than ECOG-PS. Treatment modification was recommended in one-third of patients.

KEYWORDS: aged; assessment; frailty; cancer; chemotherapy toxicity

INTRODUCTION

Older people are unique. In the process of aging, there is an individualized decline in organ system physiologic function. Combined with years of exposure and a constellation of comorbidities, each older person is a singular milieu of physiologic, cognitive, physical, and social function. When considering treatment for cancer, this individualized substrate needs to be considered.

Most cancers occur more commonly in older age. Cancer is the second leading cause of mortality.[1] The risk of malignancy peaks in the eighth decade[2] and 42% of the overall cancer population in the US is seventy years of age or older.[3-5] Despite the high incidence, older people are under-represented in cancer clinical trials.[6,7] As a result, the practice of cancer treatment in an aging population is evolving, with increasing consideration to the individualized physiology and performance measures as a marker of potential tolerability and toxicity of chemotherapy.

Oncologic societies recommend[8,9] comprehensive functional assessment prior to chemotherapy. The classic tools developed to assess functional status in cancer, such as the Eastern Cooperative Oncology Group-Performance Status (ECOG-PS)[10] and the Karnofsky Performance Status (KPS)[11] lack validation in an older population. More recently, tools have been developed which focus on an older population. For example, the Cancer and Aging Research Group Toxicity Tool (CARG-TT)[12] and the Chemotherapy Risk Assessment Scale for High-age patients (CRASH)[13] score compile components of the Comprehensive Geriatric Assessment (CGA) to predict chemotoxicity. However, the elements of CGA require time and training to deliver.

Working together, oncology and geriatric co-management can bring CGA reliably to an older population to modify the outcomes. The CGA-based frailty status of patients evaluated at the Lifespan Geriatric Oncology Multidisciplinary Clinic (GO-MDC) was compared to ECOG-PS and the risk of moderate to severe chemotoxicity (grade 3-5) using the CARG-TT. We also compared ECOG-PS and the CARG-TT.

The primary outcome was to determine if CGA-based assessment would identify more people with frailty in comparison to ECOG-PS. The secondary outcome was to assess if CGA reveals high chemotherapy toxicity in greater number of older cancer patients when compared to ECOG, thereby resulting in treatment modification favoring lower toxicity.

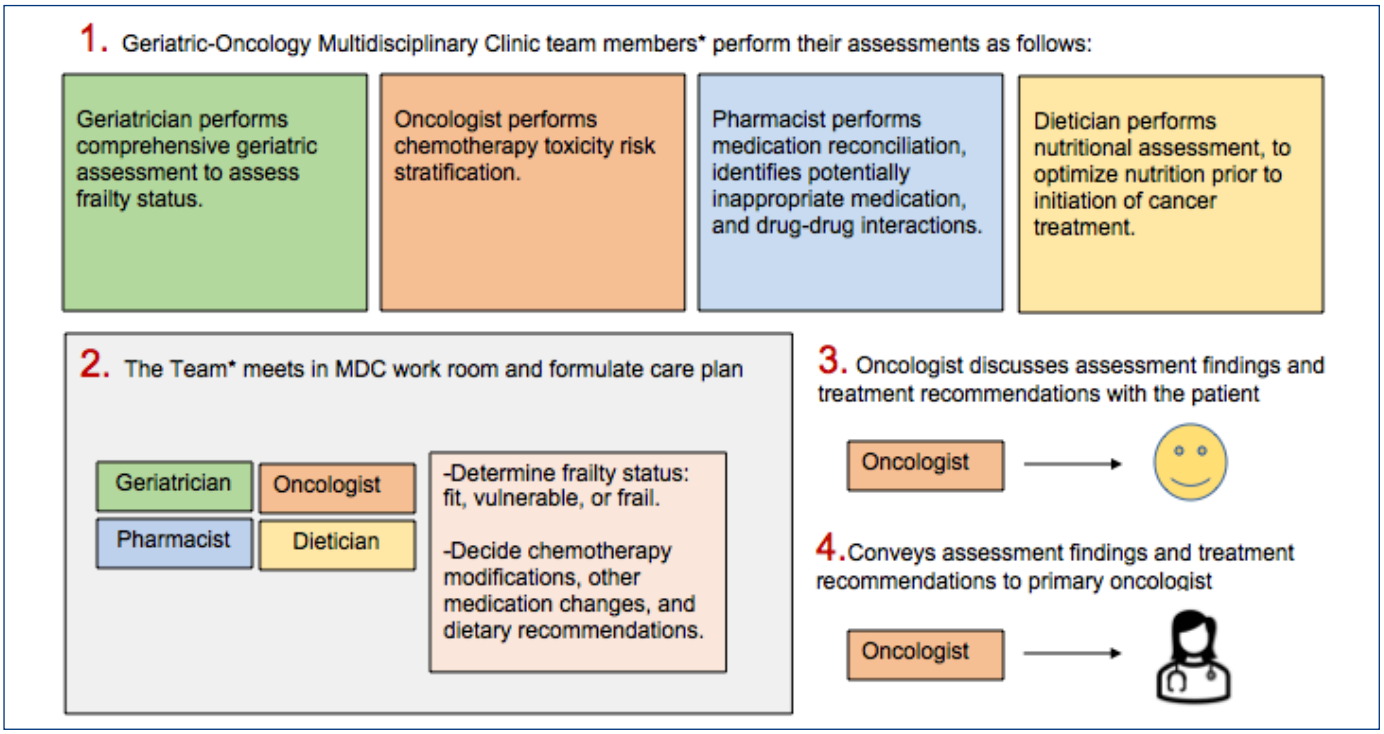
Using the clinical patient population of the GO-MDC, we performed a retrospective cohort analysis to determine these associations.

METHODS

Cohort

The retrospective cohort consists of patients seen between April 2017–March 2022 at the Lifespan Cancer Institute, affiliated with The Warren Alpert Medical School of Brown University. The members of the GO-MDC team include an oncologist, a geriatrician, a pharmacist, and a dietitian. This is a one-time consultative evaluation prior to initiation of chemotherapy in newly diagnosed or recurrent cancer patients, 65 years or older in age. The in-person assessment is ideally conducted within 7 days of referral made by the primary oncologist. This analysis was approved by the Lifespan IRB.

Figure 1.



Comprehensive Geriatric Assessment

The CGA was performed during the clinic visit and consisted of medical, oncologic, and social histories, cognitive and mood screening, polypharmacy, functional and nutritional assessment.

At the conclusion of the in-person visit, the team members met to review each case and formulated a comprehensive treatment plan based on the expertise from each discipline. A description of the contributions of each member of the inter-professional evaluation team is included in (**Figure 1**).

(CGA) Assessment Instruments

Specific tools in the CGA are detailed in **Table 1** and include Katz and Lawton Activities of Daily Living (ADL), Instrumental Activities of Daily Living (IADL) scale;[14,15] Timed Up & Go (TUG) test[16], the Mini-Cog assessment tool,[17] the PHQ-9[18], and Mini Nutrition Assessment (MNA).[19]

ECOG-PS

ECOG-PS indicates an increasing level of disability. A score of 0 indicating fully active, 1- restricted in strenuous activity, 2- restricted in work activity but ambulatory and capable of self-care, 3- capable of limited self-care, 4- completely disabled, and 5- dead.[10]

Chemotherapy Toxicity Risk

CARG-TT is a pre-chemotherapy assessment tool to predict moderate to severe chemotherapy toxicity. It is calculated from demographics, tumor and treatment variables, laboratory test results and CGA variables (function, comorbidity,

Table 1. Assessment tools used in Comprehensive Geriatrics Assessment

CGA Tools	Tool Description
Katz Index of Activities of Daily Living (ADL)	Includes self-reported measures of 6 basic self-care activities: feeding, dressing, bathing, transfer, continence, and toileting. One point is scored for independence in each activity. Score range is 0–6 with higher scores representing better function.
Lawton-Brody Instrumental Activities of Daily Living (I.A.D.L.)	Includes seven more complex activities: finances, medication management, driving, housekeeping, food preparation, shopping, laundry, and ability to use the telephone.1 point is scored for independence in each activity. Score ranges 0–8 with higher scores representing more independence
Patient Health Questionnaire – 9 (PHQ-9)	Assesses nine depressive emotional distress symptoms. Score range is 0–27. Normal mood: 1–4, Mild depression: 5-9, moderate depression: 10–14, moderately severe: 15–19, severe depression: 20–27
Mini Cog	It includes 3-word recall and a clock-draw test. Score ranges 0–5. 1 point for each correct word-recall and 2 points for a correctly drawn clock. A score of < 4 is considered abnormal.
Timed Up and Go Test (TUG)	Is used to assess risk for falls. The time it takes to walk 3 meters from a seated position and back without a break is measured. Increased risk of falls is associated with time >14s
Mini Nutritional Assessment tool (MNA)	Assesses nutritional status. It is scored from 0–14. Normal nutritional status is a score of 12–14, at risk of malnutrition is scored 8–11, and malnutrition has a score of 0–7

cognition, psychological state, social activity/support, and nutritional status). The CARG-TT score ranges from 0–19. Each risk category is associated with percentage likelihood of developing moderate to severe toxicity. Low risk is a score of 0–5 (<30%), intermediate risk, 6–9 (40–60%), and high risk, 10–19 (>70%).[20,21]

STATISTICAL ANALYSIS

All data was abstracted from the Electronic Medical Record (EMR) into a REDCap database,[22] a web-based chart review tool, and the analysis were conducted using SAS© software (Version 9.4, SAS Institute Inc., Cary, NC). The characteristics of the population are summarized with means (±SD) for continuous variables and number (%) for dichotomous variables. For the assessment instruments, we calculated literature-based cutoffs and present the number and percent. ECOG-PS was compared with CGA-based frailty and with CARG-TT moderate to severe chemotherapy risk using Chi-Square.

Table 2. Patient demographic and Clinical Data

Patient Characteristics/Demographics	Patients (n=66) (n%)
Age, years, range and mean	66–94 years, mean age:79 ± 6.9 years
Gender: Female	50 (76%)
Male	16 (24%)
Race: White	56 (85%)
Black	6 (9%)
Other/Mixed/Unknown	4 (6%)
Body Mass Index (BMI) range and mean	15–49, 29 ± 6.7
Carlson Comorbidity Index range and mean	3–20, 10.6 ± 4.3
Residence: Home	59 (89%)
Residence: ALF or Nursing home	7 (11%)
Cancer Risk Factors	
Family history of cancer	39 (59%)
History of smoking	34 (51%)
History of alcohol use	40 (61%)
New cancer diagnosis	55 (83%)
Recurrent Cancer	11 (17%)
Type of Cancer: Breast	20 (30%)
Gynecological	17 (26%)
Lung	14 (21%)
Other	15 (23%)
Stage of Cancer: Stage 1	14 (21%)
Stage 2	8 (12%)
Stage 3	17 (26%)
Stage 4	22 (33%)
Unknown	5 (8%)
Treatment received: 1st line	54 (82%)

RESULTS

The characteristics of the population (N=66) are described in **Table 2**. Consistent with the older population of Rhode Island, the cohort was older (mean age 79: range: 66-94 years), female (n=50; 76%), and racially heterogeneous (White n=56, 85%, Black n=6, 9%). Malignancies were varied with breast (n=20, 30%) gynecological (n=17, 26%) and lung (n=14, 21%) cancer represented. Most patients were newly diagnosed with cancer (83%) and had advanced cancer, stage 3 (n=17, 26%) or stage 4 (n=22, 33%).

The CGA findings are presented in **Table 2**. The population described functional limitations, with dependence in at least one ADL (n=28, 42%) and IADL (n=33, 50%). Cognitive deficits were detected on Mini Cog (n=32, 51%) and moderate to severe depressive symptoms were identified (n=26, 41%). Polypharmacy was documented in 60 patients (92%). On nutritional assessment, 26 patients (41%) were classified as at risk for malnutrition and 17 (26%) as malnourished.

The comparison of ECOG and CGA are presented in **Table 3**. CGA determined 23 patients to be fit (35%), 32 patients to be vulnerable (48%) and 11 patients to be frail (17%).

ECOG-PS was classified as non-fit (ECOG-PS ≥ 2) in 13 patients (20%) and fit (ECOG-PS: 0-1) in 53 patients (80%).

Table 3. Findings of Comprehensive Geriatric Assessment Domains and Aging Research Group (CARG) Chemo-Toxicity Classification

CGA Parameters	Patient population N= 66 (%)
Physical Function	
ADL dependence (requiring help in ≥ 1 ADL)	28 (42%)
IADL dependence (requiring help in ≥ 1 IADL)	33 (50%)
Normal TUG (time <14s)[a,b]	49 (74%)
Abnormal TUG (time ≥ 14s)	6 (9%)
Brain Function	
Mini Cog abnormal score of 0–3[c]	32 (51%)
PHQ 9 scale indicating moderate depression[d,e]	24 (38%)
PHQ 9 score indicating severe depression	2 (3%)
Other Assessments	
Polypharmacy (greater than 3 medication)	60(92%)
Nutrition: Normal	21
At risk for malnutrition	26 (41%)
Malnutrition	17 (26%)
CARG- TT[f]	
Low-risk toxicity	3 (5%)
Intermediate toxicity	36(54%)
High toxicity	27(41%)

a. Timed Up and Go test (TUG)
b. 9 patients did not participate in due to gait instability.
c. 2 patients unable to do Mini Cog due to cognitive decline.
d. PHQ-9 Patient Health Questionnaire-9
e. 3 patients were unable to participate in depression screen.
f. CARG-TT Cancer Aging and Research Group Toxicity Tool

Table 4. Comparison of ECOG-PS scores with CGA

ECOG score	CGA Assessment n=66 (n%)			
	Fit	Vulnerable	Frail	Total
0 to 1 (normal)	23 (35%)	26 (39%)	4 (6%)	53
>2 (restricted activity)	0	6 (9%)	7 (11%)	13
Total	23 (35%)	32 (48%)	11 (17%)	66

Table 5. Comparison of ECOG-PS with Cancer and Aging Research Group (CARG) Tool

ECOG score	Chemotoxicity risk calculated by CARG Tool (n)(%)		
	Low	Intermediate	High
0 –1 (normal)	3 (5%)	34 (52%)	16 (24%)
>2 (restricted activity)	0	2 (3%)	11 (17%)

Importantly, of ECOG-fit patients, CGA determined 30 (45%) to be vulnerable or frail. CARG-TT risk was intermediate in 34 patients (52%) and high in 16 patients (24%) of the patients who were classified as ECOG-fit (**Tables 4** and **5**).

CGA results correlated more closely with the chemotoxicity risk calculated by the CARG-TT, (p-value=0.0015). None of the patients who were deemed fit by CGA had a high chemotoxicity risk per CARG-TT. Treatment change to downgrade was recommended in 23 patients (37%). No treatment change was recommended in 44% of patients. Treatment modification recommendations, made by GO-MDC, were accepted by the primary oncologist in over 95% of the patients.

DISCUSSION

Older patients are a heterogeneous population and tailoring cancer treatment to the individual requires weighing risks against benefit in the context of frailty that is best assessed by CGA.[23,24] Past literature supports CGA to assist with prognostication in the scenario of adjuvant therapy[25] and risk stratification in the case of chemotherapy[26] or surgery.[27] By understanding the individualized risks and benefits, patients and oncologists can provide patient-centered treatment options.

Oncologists struggle with estimation of life expectancy, and without a reasonable estimate of life expectancy there is a risk for under- or over-treatment of patients.[28] Widely used validated prognostication tools that estimate life expectancy,[29,30,31] such as Walter-Covinsky Life tables, Lee Index and Schonberg's tool, require assessment of mobility, ADLS, IADLS, etc. These functional parameters are not routinely assessed in oncologic care but are known components of CGA. These tools estimate life expectancy independent of cancer. This becomes especially relevant in curative intent treatment, when an older patient may have a competing co-morbid condition that affects overall survival. For example, an 80-year-old woman in the top quartile of health would have a life expectancy of 13 years versus 4.6 years in the bottom quartile.[32]

For risk stratification, there are two validated tools that predict for moderate to severe chemotherapy toxicity: CARG-TT and CRASH score.[12,13,20] These tools are specifically designed and more accurate in predicting moderate to severe chemotherapy toxicity when compared to other oncologic measures of functional assessment like ECOG. The clear advantage of CARG-TT (that we utilized) over ECOG-PS was also evident. A total of 46 patients deemed fit by ECOG-PS were 'frail' based on CGA, highlighting a significant limitation of this tool. Our analysis showed that ECOG-PS can potentially miss frailty and may result in enhanced toxicity of cancer treatment.

The GO-MDC is built on literature-based models incorporating geriatric assessment into the management of older adults with cancer. CGA has a two-fold role in this clinic.

Firstly, CGA prior to cancer treatment allows for tailoring treatment based on patients' vulnerabilities, rather than at the time of occurrence of toxicity.[33] This results in better communication, patient-caregiver satisfaction, and advance care planning.

Secondly, CGA findings and subsequent use of CARG-TT leads to potential modification in treatment to minimize toxicity. This role of CGA has been well established in literature. A systematic review of 11 trials showed a change in initial treatment plan after CGA in 5–54% of patients (median 28%), mostly for less intensive therapy.[34] Similarly, the GO-MDC, change in treatment was recommended in 37% of patients also for less intensive treatment.

At GOMDC, our data analysis supports the established role of CGA as a more sensitive method for detecting frailty and CARG-TT as a better screener for unmasking chemotherapy toxicity risk. The high number of ECOG-PS 'fit' patients who subsequently scored as frail or having high chemotherapy toxicity risk highlights the importance of the more comprehensive CGA assessment.

A randomized control trial, comparing a cohort receiving CGA with one receiving ECOG evaluation-only would be a reliable means of further establishing the sensitivity of CGA and CART-TT in detecting frailty and chemotherapy toxicity risk in older cancer patients.

Additionally, CGA-based assessment also gives guidance on non-oncologic interventions that have direct impact on patients' quality of life and cancer treatment tolerance.[35,36,37] They fall into seven main categories: medication, co-morbidity optimization, mobility/fall risk assessment, cognitive screen, psychologic screen, nutritional, and social interventions.

At the GO-MDC, we identified notable cognitive, psychological, and nutritional deficits that are not routinely assessed in oncologic evaluation. None of these geriatric syndromes were uncovered by ECOG assessment.

There is limited data in literature looking at allocation of

chemotherapy based on CGA in randomized fashion. There is only one randomized control trial, in lung cancer, showing better quality of life, less toxicity, and similar survival, even though more patients had best supportive care in the CGA-based allocation of cancer treatment.[38]

Limitations

This study is a descriptive analysis and definitive conclusions regarding benefits of CGA cannot be drawn from our data analysis. Also, being a retrospective analysis, this study has an inherent patient-selection bias. The referral system to GO-MDC is entirely dependent upon the discretion of the primary oncologist. This directly impacts the diversity of patients, in terms of ethnicity, race, and cancer-type. Consequently, the referrals sent to GO-MDC were primarily breast and gynecological cancer patients.

Additionally, the primary oncologists, making triaging decisions for referrals, can potentially miss patients who otherwise may benefit from the GO-MDC evaluation.

Since the GO-MDC requires an additional clinic visit, patients may choose to forgo it, despite the referral.

GO-MDC is a one-time consultative evaluation and subsequent follow-ups are with the primary oncologist. By design, the clinic is limited in assessing the influence on treatment tolerability, patients' quality of life, and cancer outcomes.

CONCLUSION

GO-MDC provides a platform for CGA-based assessment of cancer patients and the information obtained from CGA was able to identify frailty status and chemotherapy toxicity risk. These findings are supported by the literature demonstrating that GO-MDC is able to identify frailty status for cancer treatment and implementation of CGA in routine oncology practice remains challenging.

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Impact of Geriatric Trauma Co-Management on 1-Year Mortality in Older Adults with Multiple Rib Fractures

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ABSTRACT

BACKGROUND: Rib fractures in older adults are associated with higher morbidity and mortality. Geriatric trauma co-management programs have looked at in-hospital mortality but not long-term outcomes.

METHODS: A retrospective study of multiple rib fracture patients 65 years and older (n=357), admitted from September 2012 to November 2014 comparing Geriatric trauma co-management (GTC) vs Usual Care by trauma surgery (UC). The primary outcome was 1-year mortality.

RESULTS: 38.9% (139) were cared for by GTC. Compared to the UC, GTC patients were older (81.6±8.6 years vs 79±8.5) and had more comorbidities (Charlson 2.8±1.6 vs 2.2±1.6). GTC patients had 46% less chance of dying in 1-year compared to UC (HR 0.54, 95% CI [0.33-0.86]).

CONCLUSIONS: GTC showed a significant reduction in 1-year mortality even though patients were overall older and more comorbid. This shows multidisciplinary teams are crucial to patient outcomes and should continue to be further explored.

KEYWORDS: ribs fracture; multiple trauma; geriatric assessments; frail older adults

INTRODUCTION

The United States (US) population continues to age rapidly and live longer than ever before. The population over 65 years grew by over a third during the past decade,[1] with older adults making up 17.7% of Rhode Island's population.[2] Eighty million adults will be over 65 by 2040 and they will account for one in five adults by 2050.[3] Advanced age predisposes to increased medical complexity. Most commonly, cardiovascular disease, impaired stress response, multi-morbidity, frailty, poor physiologic reserve and geriatric syndromes like falls, gait imbalance, osteoporosis, sarcopenia, polypharmacy, cognitive deficits.[4,5,6] With increased life expectancy and availability of healthcare services, we expect a significant increase in the number of patients admitted for trauma. Blunt force chest trauma makes up 10–15% of trauma admissions.[7] Rib fractures account for 10% of trauma patients, with older adults having an incidence as high as 60 per 100,000 person years.[4,8] In comparison, the US has a hip fracture incidence rate of 195/100,000 person years with other countries ranging from 2–574/100,000.[9] The two most common causes of rib fractures are falls and motor vehicle accidents (MVA).[10, 11] Osteoporosis, common in older adults predisposes to fractures in low impact, less severe and lower velocity trauma in comparison to younger patients.[12]

Multiple rib fractures in older adults result in increased morbidity and mortality.[4] Complications like pneumonia or respiratory failure, which are rare in younger populations, are common in older adults.[5,13,14,15] These can lead to doubling of mortality from around 10% to 20% in the older adults.[5,8] Furthermore, older adults have increased risk for poor outcomes like prolonged hospitalization, intensive care unit (ICU) stays, long-term disability and inability to return to baseline.[8,16,17,18] In addition, for each subsequent rib fractured, mortality increases by 19% and pneumonia risk by 27%.[4,8,19]

Current trauma guidelines recommend patients 65 years and older with two or more rib fractures get directly admitted to a unit with ICU level staffing.[17] In our institution, these patients get initial management in the Trauma Intensive Care Unit (TICU). The Usual Care (UC) typically involves the critical care trauma surgery team providing pain management and respiratory rehabilitation. The TICU team manages hemodynamic instability, intervenes surgically: for example, chest tube insertion or in rare cases rib stabilization. They coordinate care with other surgical specialties like orthopedic surgery, neurosurgery or interventional radiology on a case-by-case manner. They follow these patients closely until they are stable enough to be transferred to the regular surgical floor.

Medical literature shows that geriatric surgical co-management results in better outcomes in surgical patients[20] and in those with hip fracture.[21] Geriatric trauma co-management (GTC) was developed at our institution to provide an additional layer of care to adults 65 years and older with multiple rib fractures. A dedicated geriatrician helped manage acute medical issues, chronic comorbidities, and geriatric syndromes while the TICU team addressed the critical care needs and surgical management of these vulnerable adults.

We hypothesized that patients 65 years and older with multiple rib fractures, admitted to TICU, with GTC will have a lower 1-year mortality in comparison to the UC.

METHODS

Study design and setting

This was a retrospective cohort study conducted in Rhode Island at the state's only academic, tertiary care, level 1 trauma center. Trauma patients 65 years and older with two or more rib fractures from September 1, 2012 to November 30, 2014 were included in this study. Patients were initially managed in an 11-bed closed TICU, followed by transfer to intermediate level of care or a regular surgical floor per trauma protocol. This study was approved with waived consent by the institutional review board of Lifespan, Inc./ Rhode Island Hospital (RIH).

Patient selection

Eligible patients were placed in the GTC program at the discretion of the primary TICU team. Patients were seen with and without other injuries such as sternal fracture, retroperitoneal hematoma, or long bone fractures. We excluded patients who were not initially admitted to the TICU from the emergency department or had emergent surgery prior to arrival to TICU. Patients whose information could not be confirmed deceased with our electronic medical record and Social Security Death Index (SSDI) were excluded from analysis.

Intervention

GTC at our institution is an interdisciplinary team that started in September 2012. Patients under GTC receive an initial comprehensive geriatric assessment and daily follow-up until the day of discharge Comprehensive geriatric assessment includes prevention and management of geriatric syndromes and medical comorbidities. In addition, regular communications were maintained with the patient's health care proxy, nurses, physical therapist, occupational therapist, case manager, and social worker. The geriatrician attended daily TICU rounds and conducted informal educational sessions with the TICU team members as well as formal didactics for surgical residents. These sessions focused on core geriatric topics such as delirium, falls, cognition assessment, or polypharmacy.

Data collection

Data was collected from the Lifespan electronic medical record (Epic, Veona, WI). Baseline demographic information included age, gender, race, Charlson Comorbidity Index (CCI) and at-risk medications. We measured injury mechanism, number of injuries, Injury Severity Score (ISS), Abbreviated Injury Scale (AIS) [both scoring systems for injury severity], advanced directives and whether patients were community dwelling.

Primary outcome

The primary outcome was 1-year mortality. We defined it as patients who died during the index admission and within a year of their initial discharge. This was irrespective of the location of death, or whether they were discharged to hospice during index hospitalization. For patients whose information could not be obtained in the institute's medical record, we checked the Social Security Death Index. This was done to confirm whether they were alive within one year of their initial discharge from the hospital or not.

Secondary outcome

The secondary outcomes were 30-day readmission from index admission; admission within 1 year of index admission; and number of ED visits during the year following index admission. The number of ED visits that did not result in an admission were recorded and indications for the first three ED visits after initial discharge were recorded (not shown). The causes for the ED visits were split into categories after data collection (infection, surgical issues, cardiac issues, falls, and nervous system issues). All admissions that occurred less than or equal to 30 days after the initial discharge were considered a readmission. All post-discharge admissions were recorded until a year after the initial discharge, and the first three dates and causes were recorded. The causes for admission were then split into the same categories as previously mentioned above.

STATISTICAL ANALYSIS

Statistical analysis was done using the software program SAS© software version 9.4. Univariate analysis was done to evaluate demographic and clinical variables, using t-Student, Fisher exact test and Chi-Square tests. The Kaplan-Meier and multivariate Cox-proportional hazard model was used for calculation of survival over time at 95% confidence level. The Kaplan-Meier curves were compared with the Wilcoxon and the log-rank tests of significance. The patients were followed until they died (are considered a case) or are censored, otherwise. The multivariate model with indicators of study group was conducted to compare 1-year mortality, among all patients. This was adjusted for age, gender, race and number of comorbidities. Comorbidities included: cancer, heart failure, diabetes, hypertension, respiratory disease. We looked at admission location, home or skilled nursing facility (SNF), 30-day readmissions, surgical revision, number of ED visits, and number of readmissions within one year after discharge.

The multivariate model to compare 1-year mortality among patients that were 65–70 years an older was adjusted by age, gender, respiratory comorbidity, 30-day readmission, and number of ED visits, number readmissions within 1 year after discharge. For patients that were 85 years and older the multivariable model included all of the above and, in addition, admission from SNF, 30-day readmission, and surgical revision and ISS score.

RESULTS

395 patients with two or more rib fractures were admitted to RIH during this 26-month period (**Table 1**). Of them, 131 were under GTC and 218 under usual care (UC) with 35 excluded due to unknown morality status and three excluded as they were identified as duplicate patients (**Figure 1**). The GTC on average were older (81.6±8.6 years vs 79±8.5; p<0.005), more likely to have hypertension, live in assisted living facility with higher comorbidities (Charlson 2.8±1.6 vs 2.2±1.6; p<0.001). The GTC group had a higher ISS (13.4±7.4 vs 12.4±6.6; p=0.188) and a higher percentage residing in a skilled nursing facility (SNF) (4.3% vs 3.2%; p=0.558) but they were not significant. The AIS Score (Chest 2.8±0.5 vs 2.8±0.6; p=0.884) and number of trauma diagnoses (3.2±2.3 vs 3.7±2.8; p=0.086) did not differ. The UC group had more patients admitted from home (93.6% vs 86.3%; p=0.021).

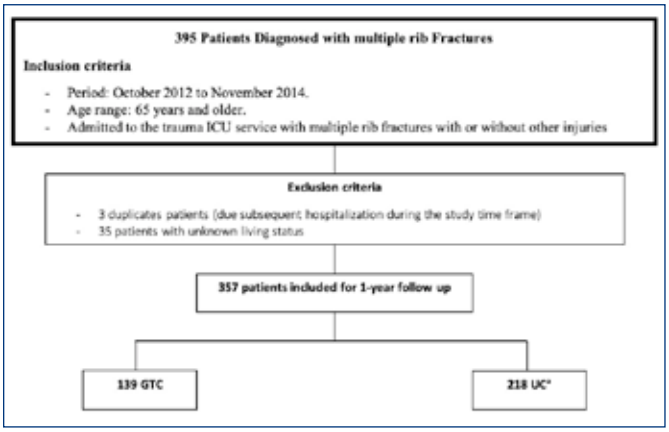
The primary outcome was 1-year mortality rate or discharge to hospice following the initial discharge (**Table 2**). When adjusted, there was a decrease in mortality by 46%; adjusted HR 0.54 [95% CI 0.33–0.86, p=0.011] in the GTC group compared to the UC. When stratified by age GTC had a reduction in hazard of mortality for ages 65–70 of 89% HR

Table 1. Baseline Characteristics of Analytical Study Sample

Patient Characteristics	Study group			
	GTC (n=139)	Usual Care[a] (n=218)	Full sample (n=357)	P-value
Age, mean (SD)	81.6 (8.6)	79.0 (8.5)	80.0 (8.6)	0.0053
Male, no. (%)	62 (44.6)	106 (48.6)	168 (47.1)	0.4581
White, no. (%)	129 (93.5)	202 (92.7)	331 (93.0)	0.7686
Injury mechanism, no. (%), Fall	106 (76.3)	148 (67.9)	254 (71.2)	0.0888
ISS Score, mean (SD)	13.4 (7.4)	12.4 (6.6)	13.0 (7.1)	0.1857
AIS Scores[b], mean (SD), Chest	2.8 (0.5)	2.8 (0.6)	2.8 (0.6)	0.8836
No. of Trauma Dx, mean (SD)	3.2 (2.3)	3.7 (2.8)	3.5 (2.6)	0.0860
No. of comorbidities, mean (SD)	2.8 (1.6)	2.2 (1.6)	2.4 (1.6)	0.0002
Admission Location				
Home, no. (%)	20 (86.3)	204 (93.6)	324 (90.8)	0.0212
ALF, no (%)	13 (9.4)	7 (3.2)	20 (5.2)	0.0139
SNF/Acute Rehab, no. (%)	6 (4.3)	7 (3.2)	13 (3.4)	0.5866

[a] care provided by the trauma team
[b] AIS scores Head, Face/Neck, Abdomen/Pelvis, Extremities, External all p>0.05
Abbreviations: AIS - Abbreviated injury scale ; ALF - Assisted living facility; CHF - Congestive heart failure ; Dx - diagnosis ; DNR/DNI - Do not resuscitate/Do not intubate; GTC - geriatric trauma co-management program; ISS - Injury Severity Score; SD - standard deviation; ALF - Assisted Living Facility; SNF - Skilled nursing facility.

Figure 1. Flow chart



[a]Care provided by the trauma team.
Abbreviations: GTC - geriatric trauma co-management program; UTI - Urinary tract infection; ICU - Intensive care Unit.

Table 2. 1-year mortality (patients who expired or were discharged to hospice) up to 1-year after post-discharge

	No. (%)	Unadjusted		Adjusted	
		HR (95% CI)	P-value	HR (95% CI)	P-value
Overall					
Usual care[a]	59 (29.5)	1 [Reference]		1 [Reference]	
GTC	34 (27.9)	0.60 (0.39–0.92)	0.0197	0.54 (0.33–0.86)	0.0105[a]
Age 65–70 years old					
Usual care[a]	10 (25.6)	1 [Reference]		1 [Reference]	
GTC	3 (15.8)	0.43 (0.12–1.59)	0.2033	0.11 (0.02–0.64)	0.0147[b]
Age more than 85 years old					
Usual care[a]	19 (34.6)	1 [Reference]		1 [Reference]	
GTC	12 (29.3)	0.56 (0.26–1.19)	0.1293	0.34 (0.13–0.91)	0.0317[d]

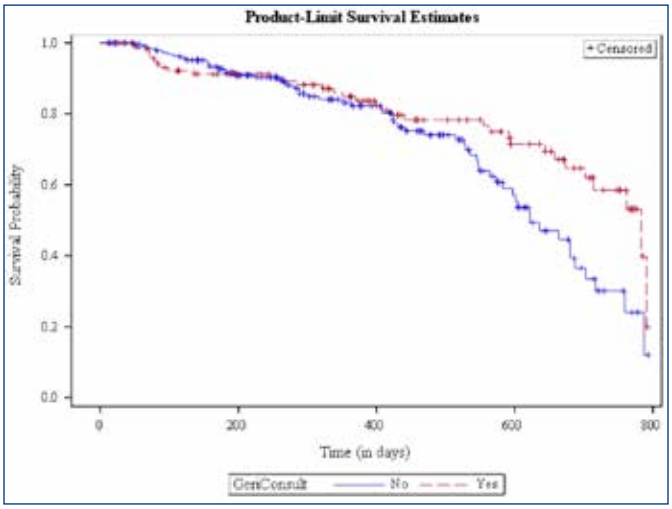
[a] Care provided by the trauma team.
[b] Results from Cox proportional hazard model with indicators of study group.
[a] controls for age, gender, race, number of comorbidities, comorbidities (cancer, CHF, diabetes, hypertension, respiratory), admitted from home or SNF, 30-day readmission, and surgical revision, number of ED visits, number readmissions within 1 year after discharge; [b] controls for age, gender, respiratory comorbidity, 30-day readmission, and number of ED visits, number readmissions within 1 year after discharge; [d] controls for age, gender, number of comorbidities, respiratory comorbidity, admitted from SNF, 30-day readmission, and surgical revision, number of ED visits, number readmissions within 1 year after discharge, ISS score
Abbreviations: CI - Confidence interval; ED - emergency department; GTC - geriatric trauma co-management program; HR - Hazard ratio; ISS - Injury Severity Score; SNF - Skilled nursing facility.

0.11 [95% CI 0.02-0.64, p=0.015] and age 85 years or older of 66% HR 0.34 [95% CI 0.13-0.91, p=0.032]. There were no difference in mortality rates in age groups 71 to 75 (23.5% [GTC] vs 22.9% [UC], p-value=1.000) and 76 to 80 (29.4% [GTC] vs 25.0% [UC], p-value=0.7458).

Figure 2 shows the Kaplan-Meier Survival curve with one-year survival with GTC significantly higher compared to UC (p=0.026), and shows that as time progresses the benefits of the GTC are even more advantageous on mortality with greater separation of the two groups.

There were no significant differences between the two groups for the secondary outcomes of 30-day readmission, admission within 1 year and number of ED visits during the year following index admission (**Table 3**). Sub analysis excluding patients that died in either group shows the same finding with higher mortality for the GTC group (5.7%) when compared with the UC (0.7%), p-value=0.0324. There was a non-significant increase in the GTC group for readmission and being seen in the emergency departments. **Table 4** shows the primary diagnosis of first three admissions within 1-year follow-up with p>0.05 between both groups for each diagnosis and admission (not shown).

Figure 2. Ribs fracture patients Kaplan-Meier survival curves, 1-year follow-up after discharge, for Geriatric Fracture Program patients compared to usual care.



Day 1 represents the first day after discharge for the first patient(s) enrolled in this study. The patients are followed until they die within a 1-year period follow-up (are considered a case) or are censored, otherwise. The Log-Rank test p-value was 0.0257. Abbreviations: ° – censured participants; GTC - geriatric trauma co-management program; UC - care provided by trauma team.

Month 1 represents the first month after one-year admission for the first patient(s) enrolled in this study. The patients are followed until they die (are considered a case) or are censored, otherwise. The Wilcoxon and the Log-Rank test p-values were 0.0049 and 0.0038, respectively.

Abbreviations: + - censured participants; GFP - geriatric fracture program.

Table 3. ED visits and readmissions within 1-year follow-up.

Outcomes	Study group			
	GTC (n=139)	Usual care[a] (n=218)	Full sample (n=357)	P-value
Number of ED visits, mean (SD)	0.9 (1.9)	0.7 (2.5)	0.8 (2.3)	0.2972
At least 1 ED visit, no. (%)	48 (34.5)	58 (26.6)	106 (29.7)	0.1100
30-day ED visit, no. (%)	16 (11.5)	17 (7.8)	33 (9.2)	0.2376
Number of readmissions, mean (SD)	0.6 (1.4)	0.4 (0.9)	0.5 (1.1)	0.1510
At least 1 readmission, no. (%)	38 (27.3)	52 (23.9)	90 (25.2)	0.4597
30-day readmissions, no. (%)	15 (10.8)	13 (6.0)	28 (7.4)	0.0980
Revision required for prior surgery, no. (%)	2 (1.5)	2 (1.0)	4 (1.2)	0.6489

[a] Care provided by the trauma team
[b] within the first 3 ED visits/admission
Abbreviations: GTC - geriatric trauma co-management program; ARF - Acute renal failure; PNA - Pneumonia; UTI - Urinary tract infection; ICU - Intensive care Unit; SD - standard deviation; SNF - Skilled nursing facility.

Table 4. Diagnosis for first 3 admissions within 1-year follow-up.

Diagnosis[a]
Heart failure
Pneumonia
UTI
Stroke
Sepsis
Infected Joint-Wound Infection
Prosthetic malfunction
Empyema
Pneumothorax
Hemothorax
Pleural effusion

[a] All diagnosis studied for first 3 admission within 1-year follow-up for GTC vs Usual Care p>0.05

DISCUSSION

Older patients with multiple rib fractures have mortality rates 2–5 times higher than younger adults despite equivalent ISS.[5, 22] Our results show that for patients with similar levels of rib-fracture severity, involvement of a geriatrician lowers mortality at one year, including those greater than 85 years of age. The involvement of a geriatrician can potentially prevent and address commonly encountered geriatric issues, including acute delirium, cognitive impairment and

or dementia with or without behavioral changes, urinary retention, falls, osteoporosis and medication management. Although literature in geriatric rib fracture co-management is limited, there is strong evidence of benefit with hip fracture patients[23, 24] and Acute Care for Elderly units.[22]

A previous study from our academic level-1 trauma center looked at in-hospital mortality for GTC and found a 40% reduction in-hospital mortality, or 9 fewer deaths.[4] This work revealed that overall in-hospital mortality can be reduced by as much as 22% in a geriatrician led co-management model of care. Recent literature has shown benefits of implementation of geriatric principles in trauma centers, though not specific to the co-managed model.[25,26]

Our analysis found a significant reduction in harm of 46% for one-year mortality or hospice referral post-discharge for older trauma patients with rib fractures followed by a geriatric trauma co-management group. In our small sample size this was more pronounced when stratified by age, especially for patients 65–70. Of note, the GTC patients were older, had more comorbidity and were less likely to be from the community. One would expect the GTC patients with worse pre-existing risk factors to have a higher mortality and hospice referral, but the inverse was seen. Sub-analysis by age was unable to identify specific trends in mortality. Our cohorts did not show any difference in trauma mechanism or severity between the two cohorts and we cannot assert how this plays a role in mortality.

We report long-term outcomes of older trauma patients with multiple rib fractures under GTC. This work adds to the literature on interventions to improve outcomes in the older population and potentially sets a foundation upon which other studies can be built. Our analysis demonstrates harm reduction in mortality and hospice referral up to one year out for all patients 65 and older, even in the more pre-morbid, frail patients.

Limitations

Our analysis was not without its limitations. The retrospective design creates potential bias as we cannot ascertain cause and effect but only associations.[4] Next, only 375 patients were able to be accounted for, thus limiting the power and generalizability of our conclusions. Also, as GTC was at the discretion of the trauma team, selection bias was most likely introduced when more frail patients were admitted. Furthermore, RIH is the only level-1 Trauma center/TICU in RI serving patients from all over the metropolitan area, regardless of the care system patient's normally use. This single center result cannot be generalized to other population demographics which likely differ from this state. We used the Lifespan chart system, the largest in RI, but were unable to access follow-up information from non-Lifespan hospitals and out-of-state residents, possibly missing key follow-up information. Additionally, we looked at post-hospital complications and did not control for prevalence of acute hospital complications such as delirium or ICU days that have a clear impact on mortality. We also did not look at patient's advance directives, family involvement regarding goals of care, or hospice.

CONCLUSION

Future studies that are larger and randomized controlled trials are needed to further understand the impact of geriatric co-management in older patients with multiple rib fractures and establish cause and effect. As the geriatric population continues to grow, further research is also needed to explore the effect of collaboration of a geriatrician with surgical subspecialties and the impact on patient outcomes. In our analysis, GTC intervention lowered 1-year mortality significantly. We need further studies while expanding access to the GTC model of care.

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Class II/III Obesity Prevalence in Residents of US Nursing Homes: Cross-sectional Study and Forecasting 2030 with COVID-19 Perspective

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ABSTRACT

OBJECTIVES: This study aimed to better understand Class II/III obesity prevalence trends among older adults residing in nursing homes (NH) nationwide.

METHODS: Our retrospective cross-sectional study evaluated Class II/III obesity (BMI ≥35 kg/m^2) prevalence among NH residents in two independent national NH cohorts. We used databases from Veterans Administration NHs called Community Living Centers (CLCs) covering 7 years to 2022, and Rhode Island Medicare data covering 20 years ending in 2020. We also performed forecasting regression analysis of obesity trends.

RESULTS: While VA CLC resident obesity prevalence was less overall and dipped during the COVID-19 pandemic, obesity prevalence increased in NH residents in both cohorts over the last decade and is predicted to do so through 2030.

CONCLUSION: Obesity prevalence in NHs is on the rise. It will be important to understand clinical, functional, and financial implications for NHs, particularly if predictions on increases materialize.

KEYWORDS: obesity; nursing homes; COVID-19

INTRODUCTION

The Centers for Disease Control and Prevention (CDC) reports that the US obesity prevalence was 41.5% among community-dwelling older adults. In 2019, obesity cost the US healthcare system nearly $173 billion.[1] Obesity has been associated with increased mortality rates for those hospitalized with COVID-19[2] and in older adults causes functional decline.[3,4] While obesity contributes to cardiovascular disease, type 2 diabetes mellitus, hyperlipidemia, metabolic syndrome, and cancer [5-8], it has an inverse association with mortality in patients with heart failure and chronic obstructive lung diseases.[9-11]

This paradox is relevant for older nursing home (NH) residents, who have a lower mortality rate if they are overweight and obese.[12] The COVID-19 pandemic further confounded the paradox with dramatic changes in NH care processes such as therapeutic activity, isolation, and assistance with eating. On face value, these changes could have mixed effects on diet and activity which affect those with obesity.[13,14] We undertook this cross-sectional observational study to better understand the trends of Class II/III obesity prevalence among older adults residing in NHs before and during the COVID-19 pandemic. We used two data sources to identify the national trends ,and secondarily, the trends in Rhode Island NHs. We hypothesized that Class II/III obesity prevalence would reflect the community and that the COVID-19 period would have limited effect on the trend.

METHODS

Study design

We performed a retrospective cross-sectional study using two data sources from a) Veterans Administration-managed nursing homes called Community Living Centers (CLC) and b) publicly available Medicare data from LTCFocus. We used two large datasets to demonstrate representativeness and generalizability of obesity prevalence in the nursing home population. LTCFocus data set was only available till April 2020. We included available VA dataset of 2021 and 2022 to represent COVID-19 period more precisely. We used a linear regression model to forecast future obesity prevalence rates by using past data trends. The secondary analysis of CLC data was approved by the Providence VAMC IRB and R&D committees.

DATA SOURCES

VA CLC data

Our VA CLC study population includes long-stay residents, defined as residents who resided in a community nursing home (CNH) or CLC at least 90 days over a specified year. We used data available through the VA's Clinical Data Warehouse (CDW) electronic medical records system from January 1, 2015 to October 20, 2022. The CDW contains sociodemographic characteristics and past medical history. Date cutoff for the "Pre-COVID" and "COVID" periods for CLC dataset was March 1, 2020.

Community nursing homes

For community nursing homes (CNH) we used data from the Medicare-administered Minimum Data Set which was

aggregated by LTCFocus. LTCFocus provides aggregated variables by year for all US nursing home residents from the 50 states and the District of Columbia (DC). We used LTCFocus to calculate nationwide Class II/III obesity trends from April 2015 to April 2020, with the latter being the most recent data. LTCFocus is sponsored by the National Institute on Aging (1P01AG027296) through a cooperative agreement with the Brown University School of Public Health.[15] We used the same dataset to calculate Class II/III obesity trends in Rhode Island from April, 2000 to April, 2020. Date cutoff for "Pre-COVID" and "During COVID" for the LTCFocus dataset was the April 2020 measurement.

OBESITY DEFINITION

From the VA CLC dataset, we included the closest available weight taken within ±365 days of a resident's first admission to a CLC and the Veteran's first height on the record, given the unlikely event of a significant change in height within ±365 days of their first CLC admission. After 365 days of the first index date admission, residents were eligible to be included in the subsequent year's cohort by the closest non-missing weight. We calculated BMI as weight divided by height in meters squared. We excluded residents with no data and extreme outlier values. Data was categorized according to the CDC obesity classification system. LTCFocus provides information for the proportion of residents with data on the first Thursday in April of the corresponding year who had a BMI of ≥ 35 kg/m^2 or higher. For consistency between the two datasets, we report CDC Class II/III (BMI ≥ 35 kg/m^2) in our comparisons, analyses, and forecasting.

STATISTICAL ANALYSIS

Between 2015 and 2022, yearly differences among VA CLC residents in association with BMI were analyzed using likelihood ratio tests. We also tested differences between pre- and during COVID-19 eras. Statistical analyses were conducted using R statistical software (Vienna, Austria Version 4.0.1) for CDW data and STATA 15.1 was used to perform all analyses on data collected from LTCFocus. As standardized mean difference values increase from 0, so does dissimilarity between the groups compared; we interpret values > 0.1 as potentially meaningful differences. We set significance at p values < 0.05. We applied a regression analysis model to evaluate the association between years and Class II/III obesity rate.

Forecasting

A linear regression model was used to predict future obesity prevalence rates, which assumes a linear trend in rates of obesity. Model was formalized as y=c + b*x (y= Class II/III obesity prevalence rate, c=constant, b=regression coefficient and x=year).

RESULTS

Table 1 describes selected characteristics of the two cohorts separated by the COVID-19 pandemic period. In general, VA CLC residents were younger and male with a higher prevalence of heart failure and hypertension and less dementia (See **Table 1**) relative to CNH residents. There was moderate positive correlation between Class II/III obesity rates in CNH and VA nursing homes in 2020 (r=0.39, p=0.0002) (**Figure 2**). Class II/III obesity was lower in the CLC residents relative to CNH residents.

The trend in Class II/III obesity for both cohorts is presented in **Figure 1** and detailed in **Table 2**. In both CLC and CNH residents, the prevalence of Class II/III obesity increased in long-term care residents since 2015, but the change was more pronounced in CNH (25.9% to 28.4%). In the COVID pandemic, there was a slight decrease in CLC resident Class II/III obesity, but the upward trend continued.

The forecasting analyses project significant increases in Class II/III obesity through 2030 in both cohorts with an approximate 10% increase in prevalence [VA CLC residents (R^2=0.83, F(1,14)=71.5, p<0.00001); and CNH residents (R^2=0.99, F(1,14)=29091 p<0.00001)]. Among RI CNH residents, Class II/III obesity prevalence rates more than doubled from 12.4% in 2000 to 28.6% in 2020 (**Figure 3**). The prevalence is projected to increase to 37.8% in 2030. (Forecasting regression model: Class II/III obesity prevalence rate = –1686.224 +0.8492857*year).

DISCUSSION

Using two available data sources, we observed upward trends in Class II/III obesity prevalence among nursing home residents within the last decade nationally, and also specifically in Rhode Island. Our analysis predicts that this trend will continue for the next decade. These trends add to the 2015 results of Zhang et al, for US nursing home residents from 2005 to 2015[17] and have important implications for clinicians, particularly those who care for nursing home residents.

Obesity rates in nursing homes mirror those in the general population. While Rhode Island ranked 41st among states in the US in 2021 with an adult obesity rate of 30.1%,[18] our study also shows that the population and NH prevalence are similar. However, a doubling in prevalence in RI over the past two decades [12.5% (2000) to 28.6% (2020)] and further increases forecast in RI and nationally, could generate added care burden in this healthcare sector, as older adults with obesity have a greater likelihood of eventually needing nursing home care.[19]

Rising obesity may increase the overall rate of functional disabilities in the population, producing greater needs for long-term services and supports.[20-22] More severe obesity (Class II/III) can impact functional dependence, increasing daily care needs.[19] For example, obese residents may require

Table 1. Baseline characteristics of residents before (CLC and community nursing homes) and during COVID-19.

	VA CLCs				Community Nursing Homes	
	Overall n (%)	Pre-COVID* n (%)	COVID* n (%)	RMD/ SMD	Pre-COVID* (%)	COVID* (%)
Residents (n)	208,780	168,783	39,997			
Age, years (SD)	71 (11.9)	70.8 (12)	72 (11.3)	0.10	79.1	78.1
Male	200,427 (96%)	162,225 (96.1)	38,202 (95.5)	0.03	39.8	37.0
BMI	27.6 (7.2)	27.6 (7.2)	27.7 (7.2)	0.01	NA	NA
Normal: BMI 18.5 to <25 kg/ m²	69,730 (33.4)	56,601 (33.5)	13,129 (32.8)	0.01	NA	NA
Overweight BMI 25 to <30 kg/m²	60,866 (29.1)	49,146 (29.1)	11,720 (29.3)	0.004	NA	NA
Class I Obesity BMI 30 to <35 kg/m²	35,801 (17.1)	28,816 (17.0)	6,985 (17.4)	0.01	NA	NA
Class II/III Obesity BMI ≥ 35 kg/m²	28,813 13.8	23,217 (13.7)	5,596 (13.9)	0.006	26.0	28.4
Race: White	149,381 (71.6%)	121,406 (71.9%)	27,975 (69.9%)	0.04	76.1	73.3
Long Stay >90 days	58,983 (28.3%)	4,519 (26.4%)	14,464 (36.2%)	0.21	NA	NA
Heart Failure	54,058 (25.9%)	42,529 (25.2%)	11,529 (28.8%)	0.08	20.1	22.3
Hyper-tension	172,820 (82.8%)	138,648 (82.2%)	34,172 (85.4%)	0.08	75.0	77.6
ADRD	70,164 (33.6%)	54,093 (32.1%)	16,071 (40.2%)	0.17	51.3	50.1
MACE	76,652 (36.7%)	60,242 (35.7%)	16,410 (41%)	0.10	NA	NA
Chronic pulmonary diseases	75,009 (35.9%	60,686 (36%)	14,323 (35.8%)	0.003	NA	NA

SMD: Standardized mean difference (values farther from 0 indicate dissimilar groups, and values >0.1 can be interpreted as potentially meaningful differences). NS: Non-significant; NA: Not available; ADRD: Alzheimer's disease-related dementias; MACE: Major adverse cardiac events. Class II/III obesity (BMI ≥ 35 kg/m²) *Date cutoff between "Pre-COVID" and "During COVID" for the CLC dataset was March 1st, 2020, and date cutoff between "Pre-COVID" and "During COVID" for the LTCFocus dataset was first Thursday in April of 2020.

Table 2. Overall obesity (BMI ≥ 30) and Class II/III (BMI ≥ 35) obesity prevalence in long-stay long-term care residents 2015–2022 nationally (n (%)).

	VA CLCs			Community Nursing Homes
Year	Total number CLC subjects	Obesity n (%)	Class II/III Obesity n (%)	Class II/III Obesity %
2015	35,266	10,758 (30.5)	4,760 (13.5)	25.9
2016	31,686	9,646 (30.4)	4,250 (13.4)	26.3
2017	31,571	9,741 (30.8)	4,389 (13.9)	26.8
2018	31,960	9,971 (31.2)	4,493 (14.1)	27.4
2019	32,378	10,115 (31.3)	4,528 (14.0)	28.1
2020	19,066	5,820 (30.5)	2,541 (13.3)	28.4
2021	18,290	5,787 (31.6)	2,619 (14.3)	N/A
2022	8,563	2,776 (32.4)	1,233 (14.4)	N/A

Obesity (BMI ≥ 30), Class II/III obesity (BMI ≥ 35)

Figure 1. Trends in Class II/III obesity prevalence rates in long-stay nationwide VA CLC residents and nationwide community NH residents from 2015 with forecasted Class II/III obesity prevalence rate to 2030 (dashed lines).

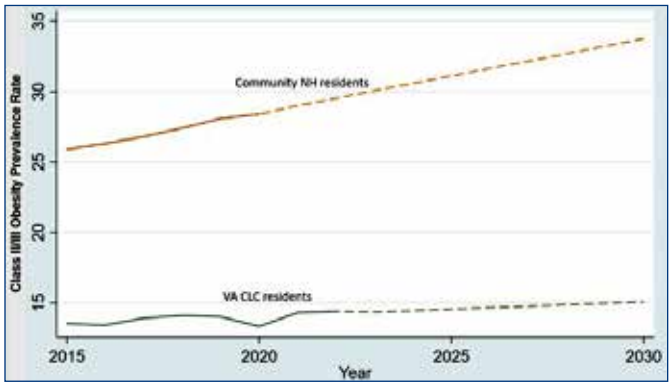


Figure 2. Correlation Plot of Community Living Center and Community Nursing Home Class II/ III Obesity Prevalence in 2020 (r=0.53, p=0.0002) (Rhode Island and Alaska do not have CLCs and are not included).

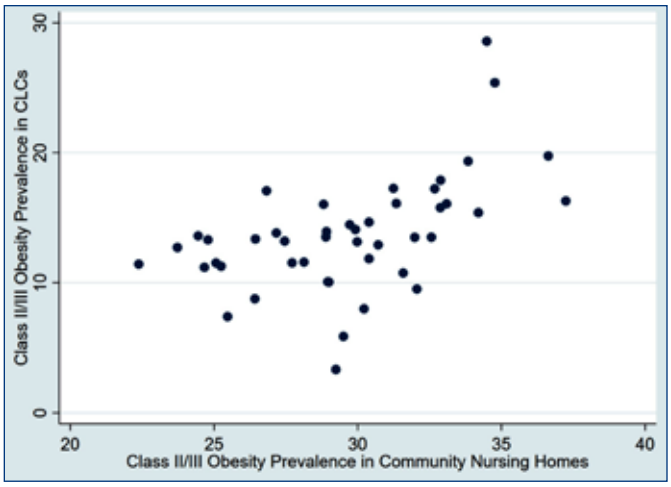
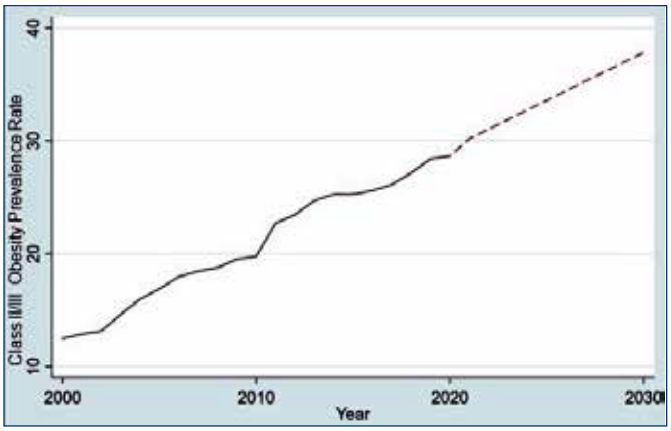


Figure 3. Trend in Class II/III obesity prevalence rate in RI community NH residents from 2000 to 2020, and forecasted obesity prevalence rate among same population to 2030 (dashed line).



more personal care assistance, often from two or more helpers. Residents with Class II/III obesity may need special equipment including enhanced designed wheelchairs, commodes, lifts, and basic diagnostic tools such as larger sphygmomanometer cuffs.[23] Obesity can potentially impact access to NHs, structural preparedness of NHs to respond to the needs of obese residents, and quality care of individuals admitted to NHs.

Obesity, as part of the metabolic syndrome, often presents with a constellation of glucose impairment, hypertension, and hyperlipidemia. The prevalence of metabolic syndrome increases to 42% by age 70.[24] This increase is mainly due to predisposing conditions including obesity, insulin resistance, inflammation, hypertension, which all increase with aging. [25] With aging, metabolic syndrome increasingly contributes to the risk for development of cardiovascular comorbidity, functional decline, and mortality. Major clinical implications of Class II/III obesity on older adults include increased risk of type-2 diabetes, high blood pressure, cardiovascular diseases and stroke.[7] These conditions help explain why NH residents with Class II/III obesity have higher mortality (OR 1.75; 95% CI, 1.10–2.80).[26] Unfortunately, the metabolic syndrome, obesity and related conditions remain understudied for nursing home residents.

A major strength of this study is the use of two national data sources from independent sample populations across the US, inferring highly generalizable findings. The CLC dataset allows for estimation of pre- and intra-pandemic obesity prevalence rates. The historical data permit linear regression-based forecasting for future obesity. More accurate and sensitive forecasting models are necessary to better understand and prepare for the impact of the worsening obesity epidemic in US NH residents.

Limitations

We note four significant limitations. First, LTCFocus does not report obesity according to the CDC obesity classification. We focused our analyses on Class II/III obesity for consistency across systems. Second, as one long-term resident may appear in several yearly cohorts means we cannot interpret changes in incidence as compared with prevalence. Third, height is collected less frequently than weight in these settings, and this may bias the ascertainment of BMI. Finally, our forecasting approach assumes a linear change in obesity rates and if rates change non-linearly may be biased, and forecasting would also benefit from inclusion of other predictors (such as case-mix, age, gender, etc.).

CONCLUSION

We found that there is an upward trend in the Class II/III obesity prevalence rate among VA CLC residents and nationwide CNH residents. We are forecasting that this trend will continue and expect it will impact the care and clinical health of NH residents, particularly the group with metabolic syndrome. Given structural, functional, and medical complexity, and the impact of obesity on NHs and NH residents, dynamic health policy changes and their implementation into the NH system are needed.

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Disparities in Utilization of Palliative Care in Patients Experiencing Homelessness

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ABSTRACT

BACKGROUND: Patients experiencing homelessness have increased disease burden, increased severity of illness, and increased barriers to accessing care. The provision of high-quality palliative care is therefore essential for this population.

STATE OF HOMELESSNESS: 18 out of every 10,000 people in the US and 10 out of every 10,000 Rhode Islanders (down from 12 in 2010) experience homelessness.

CONCEPTUAL MODEL: High-quality palliative care for patients experiencing homelessness requires a foundation of patient-provider trust, well-trained interdisciplinary teams, coordinated transitions of care, community support, integrated healthcare systems, and comprehensive population and public health measures.

CONCLUSIONS: Improving access to palliative care for those experiencing homelessness requires an interdisciplinary approach at all levels from individual providers to broader public health policies. A conceptual model rooted in patient-provider trust has the potential to address high-quality palliative care access disparities for this vulnerable population.

KEYWORDS: homelessness; health services accessibility; end-of-life care; social determinants of health

BACKGROUND

During the depths of winter every year, a network organized by the US Department of Housing and Urban Development (HUD) seeks to obtain a census of people experiencing homelessness by performing a head count in shelters and community settings on a January night.[1] The figures are as bleak as the temperature – 580,466 people experiencing homelessness were counted in 2020.[1,2] The number represents 18 of every 10,000 people in the US and is increasing, while in Rhode Island 10 out of every 10,000 people were experiencing homelessness.[1-4]

Individuals experiencing homelessness have unique health needs that are intertwined with lack of housing. They experience higher rates of mental health issues, diabetes, substance use disorder, heart disease, HIV/AIDs, and overall mortality when compared to the general population.[5-8] People experiencing homelessness often present to healthcare later in their disease courses with more severe illness, unpredictable outcomes, and complex care needs.[9] Barriers to healthcare in populations experiencing homelessness are similar to barriers to other services including cost, not knowing locations to access care, decreased access to transportation, and lack of legal identification.[10-12] Illnesses leading to unemployment and higher healthcare costs additionally limit access to care.[5] Even for patients experiencing homelessness that had employment in the previous year, the ability to receive care was limited by access to health insurance. This is the result of multiple factors, including the priority of employment over insurance and Medicaid restrictions.[13] Due to increased disease prevalence, delayed access to care, increased mortality, and increased severity of illness, people experiencing homelessness may benefit from increased access to palliative care (PC), which is specialized medical care for people with serious or life-limiting illness which focuses on the needs of the patient by providing relief of symptoms, stress, and improving quality of life for patients using a interdisciplinary team of providers.[14]

PC provides high-quality, goal-concordant care to alleviate suffering by improving quality of life[15-18] and has been shown to decrease mortality in serious illnesses,[19] including cancer.[20] PC services can follow patients through the trajectory of serious illness, are often available in inpatient and outpatient contexts, and are comprised of interdisciplinary teams.[15-20] Providing equitable access to PC is a challenge in many populations, including those experiencing homelessness.[15-18] Barriers to PC services for this population include poor understanding of one's health, limited family support, competing medical priorities, and stigma associated with both PC and homelessness.[9,21,22] PC also depends on a stable home and social support model for care, posing additional barriers for those who are experiencing homelessness.[23] Improving utilization of high-quality PC could significantly impact the overall health and quality of life for those facing specific barriers to care[6,9,13] and increased disease prevalence and severity[5-8] due to homelessness. As stated prior, high-quality palliative care broaches not only medical care but also societal issues and thus is uniquely primed to improve the lives of those with homelessness. Thoughtful and intentional planning and actions are important when confronting an issue like homelessness on this scale, and so we believe a conceptual model of how to better provide PC to those experiencing homelessness is needed.

STATE OF HOMELESSNESS IN RI

The US Interagency Council on Homelessness reports that 1,104 people were experiencing homelessness in Rhode Island in 2020,[3,4] 10 out of every 10,000 people, compared to the national 18 per 10,000.[1,3,4] In surrounding states, Massachusetts had a prevalence of 26 per 10,000 people and Connecticut 8 per 10,000 people.[3,4] In 2010, 12 in 10,000 Rhode Islanders were experiencing homelessness.[24,25] During the 2020 census, Rhode Island was also shown to have a poverty rate of 10.6% and 4.8% of the population under 65 did not have health insurance.[4] We must continue to work towards the goal of eliminating homelessness and its effects on our neighbors and patients.

Prominent community organizations working to address homelessness include the Rhode Island Coalition to End Homelessness and Crossroads Rhode Island. There are also many community-based organizations that function on a regional level within the state and provide important services to those experiencing homelessness. The Rhode Island Coalition to End Homelessness estimates that as of March 31, 2022 there are 896 Rhode Islanders living in shelters, 277 living out of doors, and 141 families waiting for a shelter.[26] These community organizations work to identify those experiencing homelessness, connect people to shelters and social services, and raise awareness about the issue of homelessness.[27]

The Veterans Affairs Medical Center in Providence is involved in the identification and reduction of homelessness in the Veteran community. The VA system uses specific medical coding to identify those at risk for homelessness and those currently experiencing homelessness to facilitate interdisciplinary approaches to providing housing and increased access to care.[28] Because of these coordinated approaches, Veteran homelessness fell almost 50% from 2009 to 2020,[1] suggesting that identification and an interdisciplinary approach can be effective at reducing homelessness.

CONCEPTUAL MODEL FOR IMPROVING UTILIZATION OF PALLIATIVE CARE IN PATIENTS EXPERIENCING HOMELESSNESS

In this review, we propose a framework for communities seeking to address these disparities in access to high-quality palliative care. The authors performed a literature review looking at PC in the setting of homelessness both in the US and Canada. While much qualitative data, and some quantitative data, was available we recognized that a framework for how to approach the care of homeless people did not exist and could be created to help better serve this population with unique needs.

Palliative care as a foundation of patient-provider trust

This conceptual model is based on a strong foundation of patient-provider trust, which is a facilitator to compassionate and dignity-focused care.[12,29] Building trust between patients and providers is important to increase access to care, engender honest communication, and encourage repeat encounters. Construction and maintenance of this trust is hardly formulaic or specific to palliative care, but is key in the field of palliative care as it focuses on sensitive and very personal psychosocial issues on top of medical issues, and thus our model seeks to denote some of the most important elements required for success in building these relationships.

Multimodal training and education

Given the unique factors and societal stigma faced by people with housing instability, working with patients experiencing housing instability requires knowledge of and sensitivity to the specific stressors they face. Multimodal provider education – such as patient-first language, open-ended interviewing rooted in curiosity, and consideration of personal and professional biases (explicit and implicit) toward homeless individuals – can help foster mutual respect and identify patient-specific goals.[11,21] Special skills may be required for nuanced conversations about goal-concordant care with people experiencing homelessness, particularly when considering the increased barriers to care (i.e., financial stressors, food insecurity, inadequate medication storage options, etc.).

Interdisciplinary teams

Teams composed of members from several disciplines working together are an important foundation of all healthcare areas, but especially important in PC when trying to support patients in all facets of the illness process.[30] We likewise acknowledge that caring for patients with housing instability is beyond the scope of any single profession. Therefore, we cannot overstate the importance of interdisciplinary approaches in serving this population. Efforts to mitigate the impacts of homelessness can follow a collective impact model, which utilizes a centralized infrastructure, a dedicated staff, continuous communication, and a shared agenda.[30] In such a model, healthcare teams must partner with shelter staff, public works departments, and social services (among others) to provide appropriate support.[30] Just as delivering high-quality palliative care relies on an interdisciplinary disciplinary team (including physicians, nurses, nurse assistants, chaplains, social workers, and volunteers), cultivating patient trust is the responsibility of all clinical and non-clinical providers within any given system.

Continuity of care and coordinated transitions

Patients experiencing homelessness have high rates of acute care (inpatient hospitalization, emergency department) utilization, which may be exacerbated by poor transitions in care.[31] This is particularly important when considering a hospital discharge, as patients experiencing homelessness may have unique barriers to discharge. In 2021, Greysen et al demonstrated that 27% of people experiencing

homelessness were discharged at night (after shelters have closed) and 11% reported sleeping outside on the first night after discharge.[31] People experiencing homelessness face competing priorities and unique hardships, such as limited resources, living within inflexible structures (e.g., shelters), inconsistent living spaces, and the time-intensive task of seeking adequate nourishment and shelter.[21] Thus, distinct and familiar patterns of follow-up - paired with additional attention during points of transition - is key in sustaining trusting relationships.

PC treats and interacts with patients as they require and move between various levels of care including care based at home, in hospitals, and in nursing homes. In this way PC is uniquely positioned to improve transitions for those experiencing homelessness. Possible interventions include discussions about housing and transportation as health issues, and communication with shelters as collaborators in discharge planning.[31]

Community infrastructure and support

Beyond optimization of trust and safe transitions within the healthcare system, involvement of existing community-based infrastructures and support systems can bolster individual patient success. Key examples may include community-based programs focused on securing stable housing for vulnerable individuals, especially as patient environments can directly impact the delivery and continuity of health care services.[9,21] Furthermore, community health workers with lived experience of homelessness can provide vital insight into how to most effectively create support systems for a given community. As our model approaches a goal of increased access to high-quality palliative care, other systems working in parallel towards distinct goals may present opportunities to concert efforts towards the unified goal of increased population health. We believe it is important to identify these groups and resources in the community and have PC interdisciplinary teams partner with them to increase access to services and care in both directions.

Integration with healthcare systems

In line with interdisciplinary and community partnership, the WHO advocates for implementing an integrated care model, defined as "an approach to strengthen people-centered health systems through the promotion of the comprehensive delivery of quality services across the life-course, designed according to the multidimensional needs of the population and the individual and delivered by a coordinated multidisciplinary team of providers working across settings and levels of care. It should be effectively managed to ensure optimal outcomes and the appropriate use of resources based on the best available evidence, with feedback loops to continuously improve performance and to tackle upstream causes of ill health and to promote well-being through intersectoral and multisectoral actions."[32] Integrated care models strive to provide patients a single, coordinated plan of care, which can positively contribute to health related quality of life.[32] Additionally, integrating care can improve outcomes in healthcare delivery with increased timeliness and communication, cost savings, and overall patient satisfaction.[33] It is important to note that integrated care models are not sufficient to quell healthcare disparities, as "integration is likely to enhance already well-established systems rather than fundamentally changing the outcomes of care."[33] Furthermore, marginalized groups were often last to see these benefits with disparities in care well documented based on race or socioeconomic status – to name a few – where Caucasians or well-off individuals receive more frequent PC.[19,33]

Population and public-health measures

As above, interventions to improve access to PC for people experiencing homelessness must extend beyond the healthcare system. Since homelessness has such broad impacts, it should be managed as both a medical and a social issue.[34] Population- and public health-level interventions that can improve access include efforts to eliminate homelessness, ensure adequate insurance coverage, and eliminate institutional and structural racism. Rapid Re-housing[35] and Housing First initiatives[36] prioritize rent subsidies and expedited housing searches to help people obtain stable housing as soon as possible. These approaches have been shown to reduce homelessness, improve food insecurity, and improve overall well-being.[36] These interventions are also cost effective.[36] As a significant amount of palliative care, including hospice, is provided in the home, the lack of stable housing becomes a crucial barrier to appropriate PC, thus these efforts to provide housing become even more critical.

Furthermore, efforts to improve access to healthcare overall can improve PC access. Issues of access may include difficulties with transportation, prohibitive cost of care, and challenges with accessing, storing, and administering medications, including analgesics.[21] In fact, an aim of the United Nations' 2030 Agenda for Sustainable Development is to "achieve universal health coverage, including... access to quality, essential healthcare services."[37] Changes to the payor structure that acknowledge and accommodate for healthcare disparities, such as comprehensive universal health insurance, are both in line with global and local efforts to improve healthcare access.

It is also important to note that racial disparities to quality PC exist independent of insurance status.[16] This is especially concerning as non-Hispanic Black and Hispanic populations are vastly overrepresented in the population experiencing homelessness (lifetime incidence of 16.8% and 8.1%, respectively, compared with 4.8% for White people).[38] These race-based differences are perpetuated by lasting impacts of institutional racism, including historic redlining policies and current discriminatory lending practices, which increases risk for homelessness.[39] While it is beyond

the scope of this review to describe the impacts of structural racism on healthcare, it is clear that BIPOC (Black, Indigenous, and People of Color) experiencing homelessness represent a group with an even greater need for targeted advocacy and support. To truly address this healthcare disparity, we must address and eliminate structural racism.

CONCLUSIONS

Patients experiencing homelessness represent a population who could benefit from high- quality PC services to alleviate suffering and improve quality of life. While our review is not exhaustive or representative of the efforts at multiple levels that communities take to support their vulnerable populations, it is evident that there are many barriers to receiving PC for patients experiencing homelessness. Efforts should be made on an individual level to cultivate patient-provider trust, on an institutional level to minimize bias and improve interdisciplinary partnerships, on a community level to improve stability and support, and on a population level to implement public health interventions to minimize homelessness and its impacts. Comprehensive, holistic interventions could improve utilization of high-quality PC services for patients experiencing housing insecurity.

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Feasibility of Light and Music Therapy in the Elderly for the Prevention of Hospital-Associated Delirium

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ABSTRACT

Hospital-associated delirium is common in older adults, especially those with dementia, and is associated with high morbidity and mortality. We performed a feasibility study in the emergency department (ED) to examine the effect of light and/or music on the incidence of hospital-associated delirium.

Patients aged ≥ 65 who presented to the ED and tested positive for cognitive impairment were enrolled in the study (n = 133). Patients were randomized to one of four treatment arms: music, light, music and light, and usual care. They received the intervention during their ED stay. In the control group, 7/32 patients developed delirium, while in the music-only group, 2/33 patients developed delirium (RR 0.27, 95% CI 0.06–1.23), and in the light-only group (RR 0.41, 95% CI 0.12–1.46), 3/33 patients developed delirium. In the music + light group, 8/35 patients developed delirium (RR 1.04, 95% CI 0.42–-2.55).

Providing music therapy and bright light therapy to ED patients was shown to be feasible. Although this small pilot study did not reach statistical significance, there was a trend towards less delirium in the music-only and light-only groups. This study lays the groundwork for future investigation into the efficacy of these interventions.

KEYWORDS: emergency department; geriatrics; delirium; dementia; quality improvement

INTRODUCTION

Delirium is a significant cause of morbidity, resulting in functional decline among hospital patients, especially older adults with dementia.[1-5] Delirium in older adults is independently associated with longer hospital length of stay,[5,6] increased mortality,[4,6,7] and increased rates of cognitive decline.[8]

Two non-pharmacologic interventions that have been trialed in delirium prevention are music therapy and light therapy. These studies have shown mixed results, with a trend toward positive outcomes.[9-16] However, few studies have explicitly looked at preventing hospital-associated delirium through interventions in the ED, and none have examined music or light therapy in the ED setting. Here, we present a pilot study investigating whether music and/or full-spectrum light provided in the ED would reduce the incidence of delirium within the first 24 hours of hospital admission.

METHODS

Setting

This was a pilot randomized controlled trial from August 2021 through December 2021 in an academic ED, Beaumont Hospital, Royal Oak, Michigan.

Recruitment

Patients were eligible for inclusion if they were 65 or older, were assigned an Estimated Severity Index (ESI) of 2-5 at triage and could either consent or have a legally authorized representative available to consent for them. The hours of enrollment and intervention were 10 am to 6 pm, Monday through Friday. Patients were excluded from the study if they were on isolation precautions due to suspected SARS-CoV-2 infection, legally deaf, intoxicated, or presented with a psychiatric chief complaint. Although patients discharged from the ED were ultimately excluded from the study, expected disposition was not considered an enrollment criterion.

Patients who consented underwent a cognitive assessment with the Short Blessed Test[17] (SBT). Those who tested positive for potential cognitive impairment (SBT score >4) were enrolled in the trial. Enrolled patients were randomized to one of the four trial arms using the MinimPy software in a 1:1:1:1 allocation ratio.[18] The hospital's Institutional Review Board approved this study.

Intervention

Patients were enrolled in one of four groups: 1) music; 2) light; 3) music and light; 4) usual care. Upon enrollment, all enrolled patients were screened for delirium by the Confusion Assessment Method[19] (CAM) by the research assistant.

Music was provided with a wireless speaker that was placed on a table next to the patient's bed. Music was stored on a memory card compatible with the available wireless speaker. Two playlists were available: one containing classical music and one containing non-vocal jazz music. Patients were allowed to choose which playlist they were given; the classical playlist was chosen if they could not choose or expressed no preference. Playlists were chosen to

standardize the music intervention across participants. Each playlist was approximately 2 hours in length and repeated until turned off. The average length of time of the intervention was four hours. Similarly, Light therapy was provided by a full-spectrum lightbox set up on a table next to the patient's bed. Lightboxes were designed to mimic natural light with a color temperature of 6,500K. Brightness was set to 5,000 lux. All interventions were discontinued when the patient left the ED.

All patients received standard medical care provided by the ED physician and subsequent hospital staff after admission. Neither patients nor ED staff were blinded to the patient's treatment arm; however, hospital staff taking care of the patients on the inpatient floors after admission were blinded to the intervention. An additional CAM screen was performed by the inpatient nurse upon each patient's arrival to their inpatient floor.

Evaluation

The age, sex, presentation date and time, and ESI were collected prospectively for all patients screened for inclusion. For those who met inclusion criteria and consented, the following items were collected prospectively: their medical record number, the SBT result, the CAM result, and the start time of the intervention. Enrolled patients were subjected to a retrospective chart review to collect the following data: race, insurance payor, point of origin, past medical history, disposition, admission diagnosis, acute care unit to which the patient was admitted, and the level of care under which the patient was admitted. To determine the incidence of delirium, data was collected on the result of the initial inpatient CAM, as well as the use of medication, physical restraints, video or human monitoring, or activation of the hospital's Rapid Response Team (RRT) for reasons of "delirium", "agitation", "mental status change", or "encephalopathy".

Outcome

A multi-modal definition of delirium was employed to accurately capture all patients who experienced delirium within the first 24 hours of admission. A diagnosis of in-hospital delirium was made if the patient required benzodiazepine or antipsychotic use, physical restraints, video or human monitoring, or RRT activation for the reasons listed above within the first 24 hours, had a positive CAM upon arrival to the floor after a negative CAM in the ED, or had a diagnosis made of "delirium", "altered mental status", or "metabolic encephalopathy" added to their chart within the first 24 hours of admission. Patients were excluded from analysis if they were discharged from the ED or if they tested positive for delirium while in the ED based on the initial CAM obtained upon enrollment in the study.

STATISTICAL ANALYSIS

Descriptive statistics (mean, median, proportion, standard deviation) were calculated for all patient characteristics. The admission diagnosis category was determined by mapping the ICD-10 code used for the admission diagnosis to one of the delineated domains. Modified Charlson Comorbidity Index[20,21] (CCI) scores were calculated by assigning past medical history diagnoses as abstracted from the chart to each domain comprising the CCI. Estimated Severity Index (ESI) scores were assigned at ED triage.

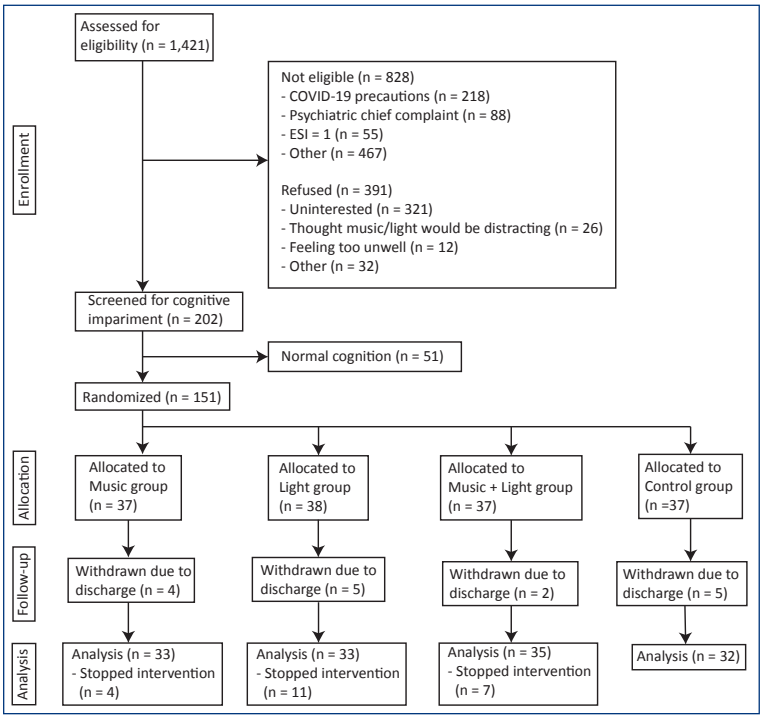
Medians were compared using the Kruskal-Wallis H test with Bonferroni adjustment for multiple groups. Differences in proportions among patient characteristics and differences in the incidence of delirium between groups were compared using Fisher's Exact Test. Significance was calculated as $\alpha = 0.05$. All statistical analyses were performed in STATA.[22]

RESULTS

Recruitment and patient characteristics

We screened 1,421 patients for study eligibility between August 2021 and December 2021. Of these, 593 were eligible to participate, and 202 consented to the study. Of those who consented, 51 patients demonstrated normal cognition by the Short Blessed Test (SBT) and were eliminated from the study. The remaining 151 patients were randomized to one of four treatment arms. Allocation and participant flow can be seen in the CONSORT diagram (See **Figure 1**).

Figure 1. CONSORT diagram showing patient flow through the study



ESI: estimated severity index

Table 1. Characteristics and Outcomes of Patients Enrolled in the Pilot Study

	Music (n=33)	Light (n=33)	Music + Light (n=35)	Control (n=32)	p value
Age, median (IQR)	84 (11)	83 (8)	83 (13)	84 (12)	0.96
Female, n (%)	17 (51.5)	20 (60.6)	23 (65.7)	22 (68.8)	0.52
Race					0.98
White	24 (72.7)	24 (72.8)	26 (74.3)	25 (78.1)	
Black	9 (27.3)	9 (27.3)	8 (22.8)	7 (21.9)	
Asian			1 (2.9)		
Charlson Comorbidity Index					0.75
≤4	18 (54.6)	17 (51.5)	20 (57.1)	14 (43.8)	
>4	15 (45.5)	16 (48.5)	15 (42.8)	18 (56.3)	
Estimated Severity Index					0.39
2	17 (51.5)	14 (42.4)	21 (60.0)	21 (65.6)	
3	15 (45.4)	16 (48.4)	13 (37.1)	11 (34.4)	
Point of Origin					>0.99
Extended Care Facility or Clinic	4 (12.1)	5 (15.2)	5 (14.3)	4 (12.5)	
Home	29 (87.9)	28 (84.9)	30 (85.7)	28 (87.5)	
Medicare Insurance	27 (81.82)	29 (87.9)	28 (80.0)	28 (87.5)	0.78
Admission Diagnosis Domain					0.037
Cardiac	10 (30.3)	3 (9.1)	5 (14.3)	4 (12.5)	
Gastrointestinal	3 (9.09)	2 (6.1)	3 (8.6)	1 (3.1)	
Respiratory	4 (12.1)	4 (12.2)	2 (5.7)	8 (25.0)	
Genitourinary	5 (15.2)	1 (3.0)	2 (5.7)	4 (12.5)	
Neurologic				2 (6.3)	
Other	11 (33.3)	23 (69.7)	23 (65.7)	13 (40).6	
Level of Care					0.13
General Medical	30 (90.9)	30 (90.9)	27 (77.1)	30 (93.8)	
Progressive Care	2 (6.1)	3 (9.1)	8 (22.9)	2 (6.2)	
Intensive Care	1 (3.1)				
Short Blessed Test Score, median (IQR)	13 (13)	12 (12)	8 (13)	13 (11)	0.41

IQR: interquartile range; n: number; %: percent.

Patient characteristics are shown in **Table 1**. Patients were predominantly female, White, and presented from home. Baseline health as measured by the Charlson Comorbidity Index was similar across groups.

Primary objective

We performed an intent-to-treat analysis on the incidence of delirium within 24 hours in each group. Two patients in the Music group became delirious within 24 hours; three became delirious in the Light group, eight in the Music + Light group, and seven in the Control group. These differences were not statistically significant (p=0.125). When patients who requested that the intervention be stopped were dropped from the study, the differences remained not significant (p=0.460).

Pairwise comparisons also did not show significance; however, the trend was toward a benefit from the intervention in the Music and Light groups. The relative risk of developing delirium in the Music group compared with the control group was 0.27 (95% CI 0.06–1.23), the relative risk for the Light group compared to the control group was 0.41 (95% CI 0.12–1.46), and the relative risk for the Music + Light group compared to the control group was 1.04 (95% CI 0.42–2.55).

Completion rates and participant adherence

A small number of patients who were randomized to receive music and/or light therapy requested that the intervention be stopped before leaving the Emergency Department. Four patients requested the intervention be discontinued in the Music group, 11 in the light group, and 7 in the Music + Light group. Of the latter, five patients requested that only the light be stopped, and two patients requested that both the light and the music be stopped. The patients' primary reason for requesting that the intervention be stopped is that the light therapy was too bright, followed by finding the light and/or music was distracting when they wished to do something else, like sleep or read. We found that if the room light was kept on when patients were receiving light therapy, they found the light treatment more tolerable. There were no incidences of ED providers requesting the intervention be discontinued. Using an intent-to-treat analysis that includes those patients who chose to discontinue the therapy, the mean duration of the intervention was 7.16 h and the median duration was 4.94 h.

DISCUSSION

Our data indicate that providing full-spectrum light and music therapy to older adult patients in the ED is feasible and can be incorporated into routine ED care. The intervention was received positively by ED staff and the majority of patients. Of those patients who did not qualify for the intervention, the most common reason was that the patient was on isolation precautions due to suspected SARS-CoV-2 infection. As the COVID-19 pandemic eases, this should cease to be a significant factor in adopting interventions such as these. Alternatively, a strict sanitation regime could be adopted that would allow equipment to be used for multiple patients sequentially without concern for their infectious status.

The primary difficulty we encountered was patients either declining enrollment or requesting that the intervention be stopped because they found the intervention to interfere

with how they wished to occupy themselves while waiting for their work up to be complete. Of these, the most common reasons were that they wanted to watch television and therefore were uninterested in music, or they found the light too bright, especially if they wished to sleep. We also found that the majority of the complaints about the brightness of the light were among those patients for whom the room lights were turned off. When room lights were left on, very few patients requested that the lights be turned off. The primary benefit of providing full-spectrum light is not providing light in general, but providing wavelengths of light that trigger an appropriate circadian response,[23,24] leaving the room light on is a simple way to improve compliance with the provided light therapy.

This small pilot study was designed to test feasibility rather than produce robust results. Consequently, it is unsurprising that none of the results reached statistical significance. However, there was a definite trend toward a positive impact in the Music and the Light arms. We plan to investigate further the potential of these interventions in a full-scale study in the future.

Limitations

Music therapy may be more challenging to implement in patient care areas divided by curtains or in a hallway, which can be mitigated by providing headphones. Additionally, our method of diagnosing hospital-associated delirium by retrospective chart review may have missed some cases of delirium, as the hypoactive subset of delirium does not usually prompt pharmacologic intervention or restraints.

CONCLUSION

We found that providing music players and lightboxes to older adults in the ED was feasible, and the reactions by patients and providers were generally positive. Although the results were not statistically significant, there was a trend towards a positive result in the Music and Light groups, indicating that these practical, low-cost interventions can have an outsized effect on lowering the burden of morbidity and mortality associated with delirium.

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Hemosuccus Pancreaticus: More Than at First Blush

HANNAH FISKE, MD; AVERILL GUO, MD; SARAH HYDER, MD, MBA

ABSTRACT

Hemosuccus pancreaticus is a rare cause of upper gastrointestinal (GI) bleeding that often presents significant diagnostic and therapeutic challenges. Here we report a case of hemosuccus pancreaticus in the setting of acute pancreatitis identified on upper endoscopy as well as endoscopic retrograde cholangiopancreatography (ERCP) and treated successfully with gastroduodenal artery (GDA) embolization by interventional radiology. Early recognition of this condition is imperative to avoid fatal outcomes in untreated cases.

KEYWORDS: Hemosuccus pancreaticus, pseudohemobilia, hemowirsungia, gastroduodenal artery (GDA) embolization, gastrointestinal (GI) bleed.

INTRODUCTION

Hemosuccus pancreaticus is the term used to describe hemorrhage from the ampulla of Vater via the pancreatic duct, and is an infrequent but potentially life-threatening cause of upper GI bleeding. It is also known as pseudohemobilia or hemowirsungia, and is most often associated with chronic pancreatitis, pancreatic tumors, or pancreatic pseudocysts. It was previously described with splenic vein or artery rupture into the pancreatic duct. Unfortunately, routine upper endoscopy often fails to correctly identify the source of bleeding in these cases. Additional workup for prompt diagnosis and early therapeutic interventions are typically required, particularly in the setting of rapidly progressive bleeds.

CASE REPORT

A 52-year-old female with alcohol use disorder, compensated alcoholic cirrhosis, and cholecystitis status post cholecystectomy presented with epigastric pain, three episodes of coffee ground emesis, fatigue, and lightheadedness. In the emergency department she was normotensive, without tachycardia, and noted to have bright red blood per rectum. Laboratory findings were notable for hemoglobin 5.9 g/dL, platelets 92 x10^9/L, lactate 4 mEq/L, lipase 1570 IU/L, total bilirubin 10.4 mg/dL, direct bilirubin 3.6 mg/dL, aspartate aminotransferase (AST) 106 IU/L, alanine transaminase (ALT) 45 IU/L, and INR 2.3. Computed tomography (CT) of the abdomen and pelvis showed evidence of acute pancreatitis with peripancreatic inflammatory changes. After initial resuscitation, upper endoscopy was performed, which revealed active bleeding at the ampulla (**Figure 1**). No blood was noted in the stomach. Immediate ERCP showed distinct bile and pancreatic duct orifices within the ampulla (**Figure 2**), with blood oozing from the pancreatic duct (**Figure 3**) consistent with hemosuccus pancreaticus. Cholangiogram

Figure 1. Blood at the ampulla, seen on initial EGD.

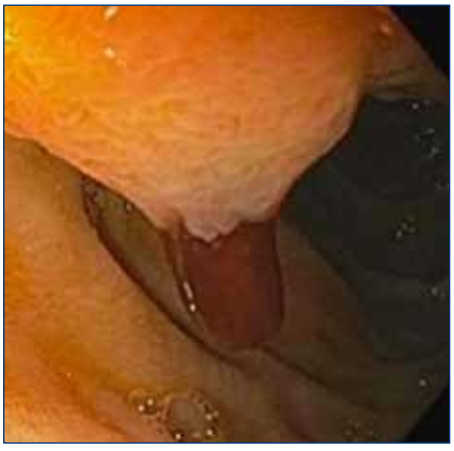


Figure 2. Biliary orifice (double arrow), pancreatic orifice (single arrow) with active bleeding, seen on ERCP.

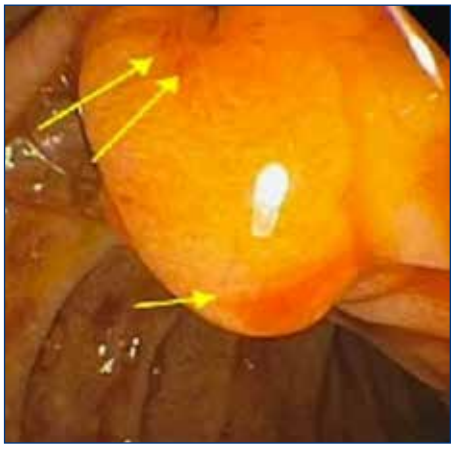


Figure 3. Blood clot at the ampulla, seen on ERCP.

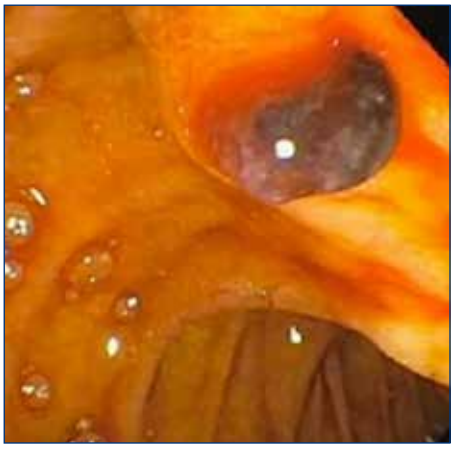


Figure 4. IR transcatheter embolization of the GDA.

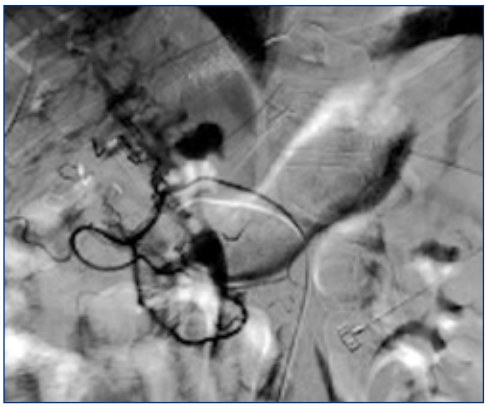


Figure 5. IR transcatheter embolization of the GDA.

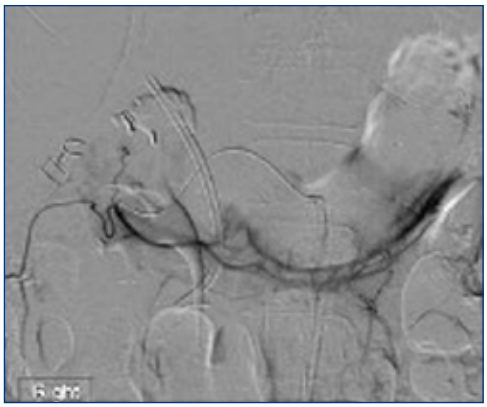
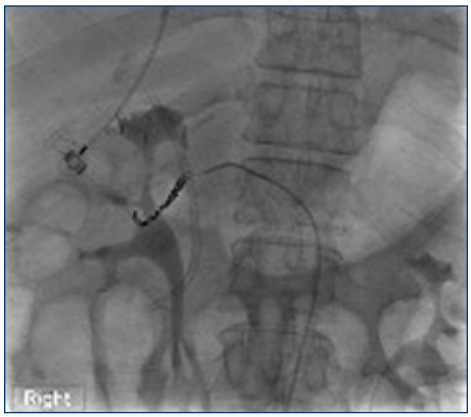


Figure 6. Completion of angiography showing catheterized common hepatic artery and no evidence of flow through the gastroduodenal artery. No evidence of active contrast extravasation or any significant vascular abnormality.



revealed a distal common bile duct, likely related to external compression in the setting of pancreatitis. After a clean balloon sweep, a 10F x 7cm plastic stent was placed into the common bile duct (CBD). The rate of blood from the pancreatic duct was increasing with collection of bright red blood now in both the stomach and duodenum. The patient underwent transcatheter celiac and superior mesenteric angiography which did not demonstrate evidence of active contrast extravasation or significant vascular abnormality; however, empiric coil embolization of the omental branch of the GDA was successfully performed achieving hemostasis (**Figures 4–6**).

DISCUSSION

Hemosuccus pancreaticus is incredibly rare, accounting for less than 1% of cases of upper GI bleeds.[1] There appears to be significant diversity in the character of bleeding, ranging from slow occult to large acute. It is classically associated with intermittent episodes of abdominal pain followed by hemorrhage from the pancreatic duct presenting in the form of melena, hematemesis, or hematochezia. Waxing and waning symptoms result from the formation and dissolution of clots in the pancreatic duct.[2] Abdominal pain is related to ductal distension and elevated intraductal pressure caused by blood in the pancreatic duct.[3]

The intermittent nature of these symptoms and the anatomic location of bleeding in this condition present a significant diagnostic challenge and require that hemosuccus pancreaticus be considered early on in the evaluation of obscure GI bleeding. Primary diagnosis relies on direct visualization of the bleed from the pancreatic duct. While upper endoscopy is an imperative part of initial testing for patients with GI bleeds, it unfortunately often fails to rule in or rule out hemosuccus pancreaticus as a potential cause and rarely reveals active bleeding at the ampulla. Upper endoscopy is only diagnostic in 30% of these cases, likely in part related to the suboptimal view of the ampulla provided by a forward-viewing gastroscope.[4] More sensitive diagnostic tests for this condition include abdominal CT angiography and magnetic resonance cholangiopancreatography (MRCP), both of which can identify hemosuccus pancreaticus as the likely catalyst for GI bleed. If unrevealing, these can be followed by catheter-based mesenteric angiography with possible embolization. Alternately, both diagnosis and treatment can be accomplished via ERCP, with the side-viewing duodenoscope allowing for a full assessment for pathology of the ampulla, bile duct, and pancreatic duct.[5]

Though it can be evasive, early diagnosis is imperative given the often rapid progression of these bleeds, as displayed in our patient above, and the up to 90% mortality in untreated cases.[5] To successfully treat hemosuccus pancreaticus, it is necessary to eradicate the source of the bleed. For the hemodynamically stable patient, success is often found with interventional radiographical procedures via angiographic embolotherapy. Management differs for the hemodynamically unstable patient, requiring intraoperative sonography and pancreatoscopy followed by surgery to excise a related pseudoaneurysm/pseudocyst or to ligate the proximal and distal arteries around the pseudoaneurysm.[6] Regardless of the modality chosen for diagnosis or therapy, it is clear that early consideration of hemosuccus pancreaticus in the differential is key.

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Evacuation of an Epidural Hematoma Without Neurosurgical Intervention

SAKINA H. SOJAR, MD; ERIKA THAYER, DO; ELIZABETH JACOBS, MD

CASE REPORT

An 11-year-old female presented to the pediatric emergency department (PED) after a truck collided into her. She had lost consciousness initially but had a Glasgow Coma Score of 15 when emergency medical services arrived. At the PED, physical exam was notable for a left superolateral aspect forehead abrasion, left upper eyelid edema, and left subconjunctival hemorrhage. She complained of left eye visual loss, pain, and diplopia.

Facial CT demonstrated a non-displaced frontal bone fracture extending into the left lateral orbital wall with associated retrobulbar hematoma and proptosis (**Figures 1 and 2.**).

Computed tomography (CT) of the brain revealed an extra-axial fluid collection consistent with epidural hemorrhage, compressing the left frontal lobe by 18mm at maximal thickness (**Figure 3A**).

Lateral canthotomy and cantholysis were performed to

Figure 1. Axial CT demonstrating [**A**] nondisplaced left frontal bone fracture with underlying epidural hematoma and scant foci of pneumocephalus. [**B**] The frontal bone fracture extends inferiorly to involve the greater wing of the sphenoid and [**C**] the lateral wall of the orbit which is minimally comminuted and displaced.

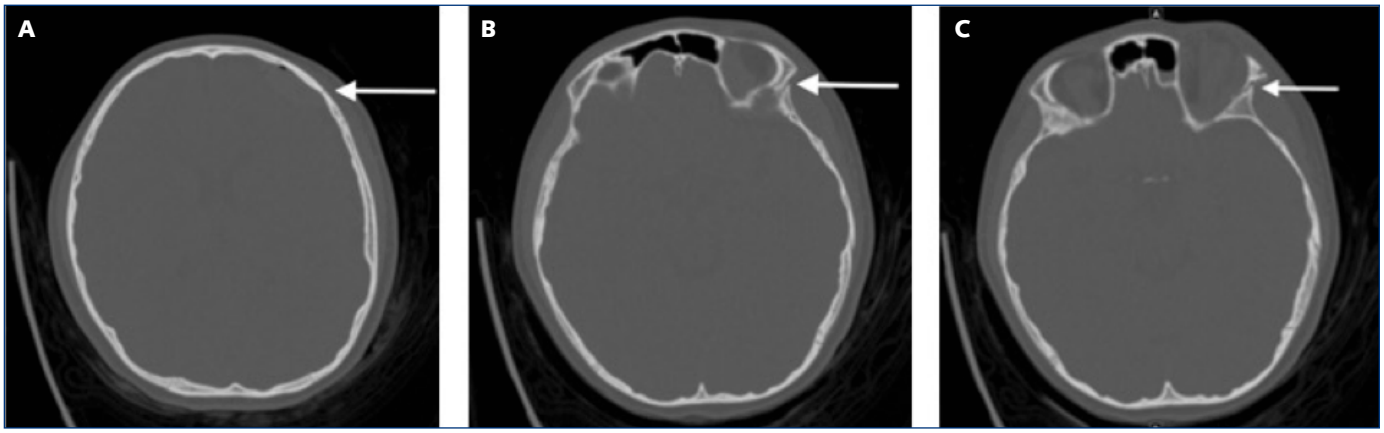


Figure 2. Axial CT demonstrating an extraconal hematoma along the lateral wall of the left orbit with secondary proptosis.

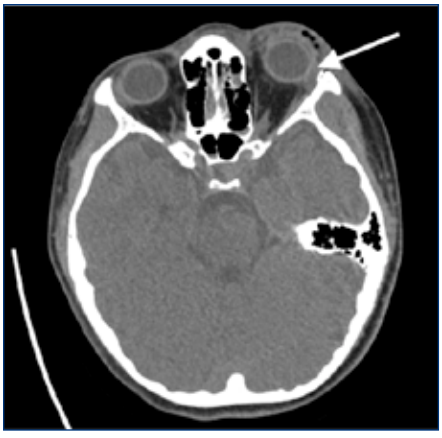
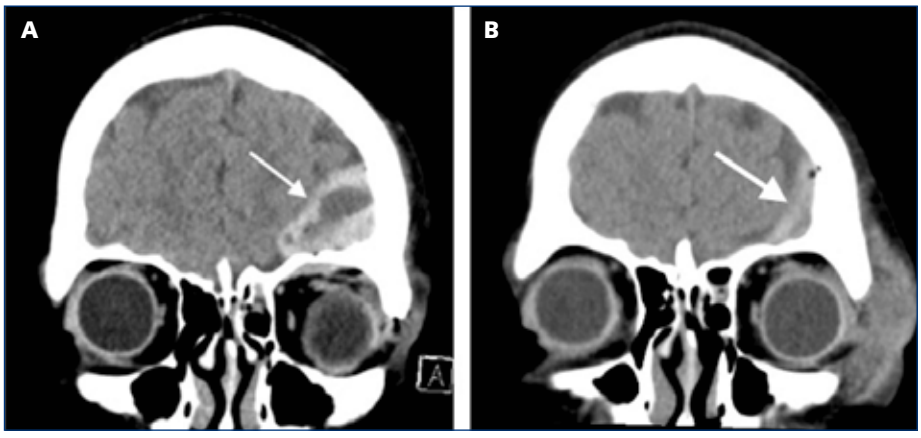


Figure 3. Coronal CT demonstrates [**A**] left frontal epidural hematoma and scant foci of pneumocephalus before lateral canthotomy [**B**] Decreased size of the left frontal epidural hematoma following lateral canthotomy.



decompress the orbital compartment. Immediately afterward, the patient's visual symptoms improved.

Orbital compartment syndrome is a sight-threatening emergency requiring prompt intervention to prevent vision loss.[1,2] Decompression is performed by the following steps: 1) The area is sterilized; 2) The tissue is anesthetized; 3) The lateral canthus is crushed to minimize bleeding; 4) The lateral canthus is incised to reveal the lateral canthal tendon; 5) The lateral canthal tendon is cut to release the pressure.[3]

Epidural hematomas often require neurosurgical operative intervention.[4,5] Remarkably, a repeat head CT obtained hours later revealed an interval decrease in the epidural hematoma to 5mm at its maximal thickness (**Figure 3B**). We hypothesized that the lateral canthotomy and cantholysis evacuated a portion of the epidural hemorrhage. The patient was admitted to the pediatric intensive care unit and subsequently did not require any neurosurgical interventions.

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Management of Acute Appendicitis in HIV/AIDs Patients: A 19-year Review from the National In-Patient Sample

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ABSTRACT

BACKGROUND: Acute Appendicitis (AA), one of the most common surgical emergencies, is usually managed operatively. There is a paucity of data addressing how HIV/AIDS affects management of acute uncomplicated appendicitis.

METHODS: A retrospective review of HIV/AIDS positive (HPos) versus negative (HNeg) patients with acute, uncomplicated appendicitis over a 19-year period. The primary outcome was undergoing appendectomy.

RESULTS: Among 912,779 AA patients, 4,291 patients were HPos. HIV rates increased from 3.8/1,000 in 2000 to 6.3 per 1,000 appendicitis cases in 2019 ($p<0.001$). HPos patients were older, less likely to have private insurance, and more likely to have psychiatric illnesses, hypertension, and a history of prior malignancy. HPos AA patients underwent operative intervention less often than HNeg AA patients (90.7% versus 97.7%;$p<0.001$). Overall, comparing HPos to HNeg patients, there was no difference in post-operative infections or mortality.

CONCLUSION: HIV-positive status should not deter surgeons from offering definitive care for acute uncomplicated appendicitis.

KEYWORDS: Appendicitis, HIV, AIDS

BACKGROUND

Appendicitis remains one of the most common surgical emergencies worldwide. It is reported that the lifetime risk of developing acute appendicitis is approximately 7%.[1,2] The management of acute uncomplicated appendicitis usually involves operative intervention with an appendectomy. However, there are several reasons why operative intervention may not be undertaken, including the presence of certain medical comorbidities that may preclude or prompt hesitancy to provide operative intervention. The publicly available National Inpatient Sample (NIS) dataset includes the largest number of hospitalized patients in the US over a long period and is coded with respect to significant demographics, medical comorbidities, and hospital type.[3] This allows for a longitudinal, regional, and hospital type-based review of an evolving process. With the frequency of appendicitis across the general population, there are high rates of associated medical comorbidities[4-7] among patients presenting with acute appendicitis, including human immunodeficiency virus (HIV).[8]

HIV is a virus that predominantly affects T-cells, a type of lymphocyte involved in the adaptive immune system. HIV is known to complicate many aspects of the management of other acute and chronic medical conditions.[9,10] It is believed that over 40 million individuals are living with HIV worldwide.[11] Improvements in early detection and treatments have extended the life expectancy of patients with HIV.[12] As a result, more HIV patients are likely to present with acute surgical emergencies. With these improvements in HIV therapeutics, the impact of HIV upon medical and surgical conditions has evolved over the past two decades. Historically, the presence of HIV was considered a contraindication to operative management of many elective surgical conditions. This was especially true for individuals who had progression of their disease to acquired immunodeficiency syndrome (AIDS). However, more recently, the physiologic presentation of a surgical emergency often is prioritized over other chronic medical problems[9] when deciding on operative intervention.

Currently, there is no data addressing the effect of HIV upon the presentation and management of acute uncomplicated appendicitis. Data is also lacking with regards to how this has changed as HIV has become a more manageable illness over the last few decades. This work will undertake a review of the evolution of how HIV affects the surgical management of acute uncomplicated appendicitis. We hypothesize that HIV is now less often considered a contraindication to operative intervention for acute uncomplicated appendicitis compared to prior eras.

MATERIALS AND METHODS

This is a retrospective review of the National In-Patient Sample (NIS). The NIS is a large publicly available dataset of inpatients across the US. We reviewed patients, aged 18 years and older, with acute uncomplicated appendicitis over a 19-year period. To review the impact of HIV/AIDS status upon the management of patients with appendicitis, patients were grouped into HIV/AIDS positive (HPos) and

HIV/AIDS negative (HNeg) at the time of admission for appendicitis. The dataset was reviewed for demographics, insurance status, medical comorbidities and hospital outcomes. Variables used to measure racial and social disparities included race, insurance status, income quartile (based on zip code of residency), and hospital teaching/location status. For race, patients were grouped into White, Black, Hispanic, Asian and other. Insurance status was classified as Private, Medicare/Medicaid, or none (uninsured). Medicare and Medicaid were grouped together to assess the effect of government-based healthcare insurance versus commercial or private insurance. The hospital teaching and location status was classified as rural (non-teaching), urban non-teaching, and urban teaching.

The dataset was reviewed for comorbidity profile, looking for either the most clinically significant or most common comorbidities that were present at the time of admission to the hospital with appendicitis. This data did not include any medical comorbidity that was diagnosed by the in-hospital treating team after the patient had been admitted to the hospital. Patients were classified as being obese if they had a Body Mass Index (BMI) of greater than or equal to 30 at the time of presentation to the hospital.

To assess the impact of HIV/AIDS upon the management of patients with appendicitis, the dataset was queried for surgical intervention as to whether they underwent appendectomy, and if so, whether a laparoscopically versus open approach was undertaken. The conversion rate from a laparoscopic to an open procedure was also assessed. Further, among those who did undergo operative intervention, the time to operation was also noted. Specifically, we assessed rates of patients who underwent operative intervention within 24 hours of presentation. The hospital outcomes, including length of stay, discharge disposition location, and mortality were assessed.

All statistical analyses were performed using SIGMAPLOT 12.5. Chi-squared analysis was used for categorical data and Mann-Whitney U was used for continuous data. Results are reported as mean and standard error of the mean for continuous data. Statistical analysis included ANOVA across multiple groups, and significance was set as $p<0.05$.

RESULTS

Overall, there were 912,779 patients admitted for acute uncomplicated appendicitis (AA) over 19 years, among whom 4,291 patients (0.47%) were HIV positive or had a diagnosis of AIDS (HPos). Over the 19 years, the rates of AA patients being reported as HPos were noted to steadily increase from a rate of 3.8/1,000 appendicitis in the year 2000 up to a rate of 6.3/1,000 appendicitis cases in 2019 ($p<0.001$) (**Figure 1**). HPos patients were older (40+/–0.5 vs 35.9+/–0.04 years; $p<0.001$) and less likely to be female (18.3% versus 45.9%;$p<0.001$). With respect to race, HPos patients were significantly more likely Black (27.9% versus 6.3%; $p<0.001$), and less likely to be White (39.0% versus 52.9%; $p<0.001$). There was no difference in rates of patients being Hispanic (15.2% versus 17.4%; $p=0.22$). HPos patients less often had private insurance (42.2% versus 63.2%; $p<0.001$), and markedly more likely to have Medicare/Medicaid insurance (40.4% versus 16.2%; $p<0.001$). There was no difference between groups with respect to those being uninsured (12.5% HPos versus 14.3%; $p=0.28$) (**Table 1**). With respect to medical comorbidities, HPos patients were less likely to be obese (3.9% versus 6.5%; $p<0.047$), but were more likely to have psychiatric illnesses (22.2% versus 10.7%; $p<0.001$), hypertension (18.8% versus 11.0%; $p<0.001$), a history of prior malignancy (4.5% versus 1.5%; $p<0.001$), or be a smoker (19.7% versus 12.3%; $p<0.001$). There was no difference in rates of diabetes (6.1% versus 4.5%; $p=0.1$) or COPD (0.7% versus 0.3%; $p=0.09$) (**Table 2**).

Overall, HPos patients were significantly less likely to undergo operative intervention for their appendicitis (90.7%

Figure 1. The changing rates of HIV/AIDS positivity among patients admitted for acute uncomplicated appendicitis over the 19 years.

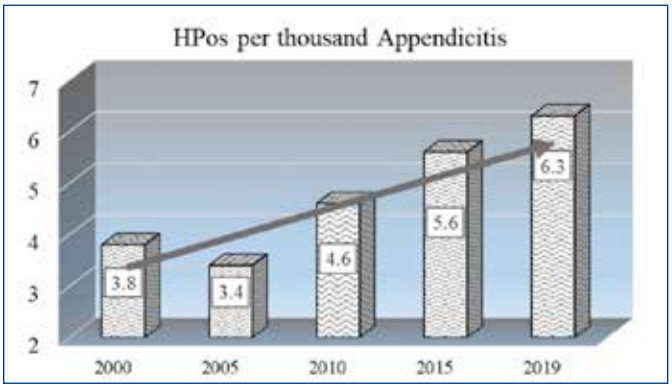

Table 1. Demographic differences between HIV-positive and negative patients presenting with acute appendicitis.

	HPos N = 4,291	HNeg N = 908,488	p-value
Age	40.0 (+/–0.5)	35.9 (+/–0.04)	<0.001
Female	18.3%	45.9%	<0.001
Race			
Black	27.9%	6.3%	<0.001
White	39.0%	52.9%	<0.001
Hispanic	15.2%	17.4%	0.2
Other	6.6%	6.7%	0.9
Insurance Status			
Private	42.2%	63.2%	<0.001
Medicare/Medicaid	40.4%	16.2%	<0.0001
Self/Uninsured	12.5%	14.3%	0.28

Table 2. Differing rates of medical comorbidities between HPos and HNeg acute appendicitis patients.

	HPos N=4,291	HNeg N=908,488	p-value
Anxiety	4.1%	2.7%	0.07
Hypertension	18.8%	11.0%	<0.001
COPD	0.7%	0.3%	0.095
Smoker	19.7%	12.3%	<0.001
Cirrhosis	1.6%	0.5%	0.0012
Diabetes	6.1%	4.5%	0.1
History of Cancer	4.5%	1.5%	<0.001
PyschDisease	18.1%	8%	<0.001
Obesity	3.9%	6.5%	0.048

Table 3. Rates of operative intervention for appendicitis between HPos and HNeg patients across differing hospitals types.

	HPos	HNeg	p-value
All hospital types			
Appendectomy	90.7%	97.7%	<0.001
Operation within 24 hours	72.8%	84.5%	<0.001
Laparoscopic	98.8%	98.7%	0.85
Urban Teaching			
Age	40.2 (+/–0.6)	35.7 (+/–0.04)	<0.001
Appendectomy	89.5%	96.8%	<0.001
Rural Non-Teaching			
Age (years)	36.8 (+/-0.7)	35.9 (+/-0.05)	0.85
Appendectomy	95.5%	97.3%	0.6

versus 97.7%; p<0.001). Given the differences in demographics and patient characteristics, a multivariable regression analysis was undertaken. Accounting for age, sex, race, comorbidities, and insurance status, HPos patients were still significantly less likely to undergo operative intervention for acute uncomplicated appendicitis (OR=0.27 (95%CI=0.18–0.41)). Among HPos patients who did undergo operative intervention, there was no difference in rates of cases being undertaken via a laparoscopic approach (98.8% versus 98.7%; p=0.85) versus an open approach. HPos patients were significantly both less likely to undergo operative intervention within 24 hours (72.8% versus 84.5%;p<0.001) and were noted to have had overall longer time to operative intervention.

We next reviewed types of hospitals (rural versus urban non-teaching hospitals versus urban teaching hospitals). It was noted that HPos patients, compared to HNeg patients, were more likely to have presented to an urban teaching hospital compared to either urban non-teaching or rural hospital (67.8% versus 41.9%; p<0.001). Among urban teaching hospitals, HPos patients were older (40.2 +–/– 0.6 versus 35.7 +/–0.04 years; p<0.001), less likely female (18.4% vs 46.1%; p<0.001) and less likely to have private insurance (38.8% versus 59.6%; p<0.001). With respect to intervention in urban teaching hospitals, HPos patients were significantly less likely to undergo operative intervention (89.5% versus 96.8%; p<0.001) (**Table 3**). Among rural hospitals, comparing HPos and HNeg patients, there was no difference in age (36.8 years versus 35.9 years; p=0.85) or female sex (31.8% versus 44.6%; p=0.27) or types of insurance. Further, within rural hospitals, there was no difference in rates of operative intervention between HPos and HNeg patients (95.5% versus 97.3%; p=0.6) (**Table 3**).

Across all hospitals, HPos patients had on average a 1-day longer length of stay (2.5+/–0.1 versus 1.5 +/–0.01; p<0.001). This was also evident when reviewing patients who were

Table 4. Outcome differences including LOS, SSI, and mortality between HPos and Hneg patients.

	HPos	HNeg	p-value
Operatively managed			
LOS (days)	**2.5 (+/–0.1)**	**1.5 (+/–0.1)**	**<0.001**
SSI	**9.6%**	**5.7%**	**0.009**
Mortality	**0.6%**	**0.35%**	**0.35**
Non-Operatively managed			
LOS (days)	**3.8 (+/–0.2)**	**2.7 (+–/0.01)**	**<0.001**
Mortality	**2.5%**	**2.3%**	**0.2**

Table 5. Multivariable regression analysis to predict outcomes for HPos patients with acute appendicitis, including undergoing appendectomy and mortality.

	Odds Ratio (95% CI)
Appendectomy	0.27 (0.18–0.41)
Mortality among operative management	0.95 (0.92–1.05)
Mortality among non-operative management	0.89 (0.78–1.43)

managed non-operatively, with HPos patients having a longer length of stay (3.8+/–0.2 versus 2.7+/–0.01 days; p<0.001). With respect to surgical site infections, combining deep and superficial surgical site infections, HPos patients compared to HNeg patients had significantly higher rates of SSI (9.6% versus 5.7%; p=0.009). Overall, among all patients managed operatively, there was no difference in mortality between HPos versus HNeg patients (0.6% versus 0.35%; p=0.35) (**Table 4**). On multivariable regression analysis, there was no increased risk for mortality for HPos patients whether managed operatively (OR=0.95 (95%CI=0.92–1.05) or among those who were managed non-operatively (OR=0.89 (95%CI=0.78-1.43) (**Table 5**).

DISCUSSION

Acute appendicitis is one of the most common surgical emergencies worldwide.[2,13,14] Operative intervention has been considered the standard of care for acute, uncomplicated appendicitis for over 75 years.[15] The incidence of acute appendicitis has been reported to be approximately 0.1% in the general population, compared to 0.5–3.5% among HIV-positive / AIDS patients.[16, 17] We undertook a review of the National In-Patient Sample (NIS) for patients who presented with acute uncomplicated appendicitis and stratified patients into those who were noted to be HIV positive or who had the diagnosis of Acquired Immunodeficiency Syndrome (AIDS) (HPos) upon presentation. Overall, it was noted that HPos patients were older, more likely to be male, and more frequently presented to an urban teaching hospital. Our finding of HPos appendicitis patients being older than the general appendicitis population is in keeping with prior reports of appendicitis in HIV-positive patients.[17] Overall, those presenting to urban teaching hospitals were less likely to be managed operatively, whereas there was no difference in operative versus non-operative rates in rural hospitals. Large reviews, including our data, over an extended period of time, are needed to add to the understanding of the impact of HIV that may contribute to a body of literature that currently lacks significant consensus guidelines[9] for the management of appendicitis.

A publication of 5 patients with *Pneumocystis carinii* pneumonia in 1981 initiated public awareness in the US of the HIV/AIDS epidemic.[18] Advances in education and antiretroviral therapy have led to significant decreases in HIV/AIDS-related mortality,[19] and have led to the acceptance of HIV status as a chronic medical comorbidity.[20, 21] It is estimated that 10–40% of patients who are HIV positive will present with a complaint of abdominal pain requiring a surgical evaluation and work-up.[22] Despite the relative increase in HIV-specific causes of abdominal pain, including lymphomas or cytomegalovirus (CMV) gastroenteritis,[23,24] the predominant causes of abdominal pain in the HIV patient reflect surgical illnesses common to non-HIV patients, including appendicitis, diverticulitis, or cholecystitis presenting with similar frequency as the general population.[25,26] The work-up, therefore, of an HIV-positive patient with a possible surgical condition or surgical emergency should follow standard work-up akin to a patient without HIV or AIDS. Additional investigations such as MRI or C-reactive protein, do not add additional benefit but may lead to delays in definitive care[27] and higher rates of complications. Further, providers should not be swayed away from a diagnosis of appendicitis merely due to a normal presenting white blood cell count in the setting of a classic history and physical examination.

The original reports of very high peri-operative mortality among surgical patients with HIV led many to argue that non-operative management of surgical conditions should be employed as much as possible. However, this dictum has been challenged over the past decade. Davidson et al demonstrated that a delay in the diagnosis or definitive treatment of a surgical patient with HIV/AIDS will result in increased morbidity and mortality.[28] It is believed that the original reports of very high morbidity and mortality rates in HIV patients requiring abdominal surgical procedures[24, 29] have significantly decreased due to early use of effective antiretroviral agents.[30] Significant interest has risen recently regarding the use of antibiotic therapy and non-operative management as a first-line treatment for acute uncomplicated appendicitis instead of appendectomy.[31,32] It has been argued that non-operative management of acute appendicitis avoids the risk of post-surgical complications associated with appendectomy[33] while preserving the immune function of the appendix,[34] which could be key to a patient in a potentially immunocompromised state such as HIV. Conversely, the reported failure rate for non-operative management of appendicitis – as high as 30% within the first year after the initial presentation and almost 40% after 5 years – with the associated increased appendicitis-related care cost,[35,36] would lean heavily towards surgical intervention of appendectomy as the definitive and early treatment of uncomplicated acute appendicitis. Further, McCutcheon et al demonstrated a 15-fold higher all-cause inpatient mortality with non-operative management (1.5% vs 0.1).[37] Interestingly, the authors demonstrated that this difference in mortality was mostly due to the presence of underlying chronic conditions or malignancy, a finding noted among the HPos population within our study. Great caution needs to be given before undertaking non-operative management in lieu of offering definitive source control to a patient with a dysfunctional immune system.

Within our dataset, we noted that HPos patients had longer lengths of stay, and among those who were managed operatively, fewer patients underwent operation within 24 hours of presentation. Although the reason for the increased length of stay cannot be ascertained from this retrospective dataset, several possible explanations must be considered. It is possible that this was due to delay in making a definitive surgical plan while awaiting input from non-surgical specialists for management of the associated medical comorbidities, including infectious disease consultation. Further, surgeons may have a degree of uncertainty regarding the possible differential diagnosis in an HPos patient with right lower quadrant pain or, more specifically, in an HPos patient with an inflamed appendix. Acute appendicitis in HIV/AIDS patients is most commonly due to fecalith obstruction; however, HIV-related causes are also possible. Whitney et al reported that as many as 30% of HIV patients with appendicitis had HIV- or AIDS-related causes, including typhlitis, lymphoid hyperplasia and obstruction, or related to Kaposi's sarcoma.[38] However, many of these early studies were small and involved mainly patients with later-stage disease.

With advances in antiretroviral agents, this rate is believed to have fallen considerably.[17]

It was noted that HIV-positive patients carried a higher burden of medical comorbidities, including hypertension, obesity, a prior history of malignancy, and a history of psychiatric illnesses, including anxiety, requiring medical attention.[12] Mitra et al also noted an increased rate of comorbidities and neuropsychiatric conditions in older HIV patients compared to an age-matched cohort.[39] The increased rate of neuropsychiatric conditions is unlikely to be directly due to HIV-disease status, but rather may reflect the stressful and emotional impact of living with HIV has on life experiences.[40] These findings of increased comorbidities may also reflect increased screening for medical comorbidities once an HIV-positive patient is identified within the health system.[41] Patients who are HIV positive often undergo frequent screenings and medical examinations.

We demonstrated an almost two-fold increase in the presence of HIV among patients with acute, uncomplicated appendicitis over a two-decade period. We do not believe that this reflects a spreading of HIV. Rather, this likely represents higher rates of testing by primary care providers and earlier detection of HIV.[42] Rates of screening for HIV among populations still remain low,[43] and published guidelines for screening and diagnostic testing have shown only a relative effectiveness in increasing screening for HIV[44] among the general population. Our data is in concurrence with the statement by Saltzman et al, noting that HIV status should not be used to determine the suitability of the patients with urgent and emergent surgical needs.[45] Understanding this is critical because when surgical intervention was undertaken within HPos patients, there was no difference in outcomes compared to patients without HIV.

There are several limitations to this project given the retrospective nature of this work. We were unable to account for any clinical presentation differences between patient groups; however, by opting to review only acute uncomplicated appendicitis we sought to produce a relatively homogeneous pathology in our dataset. This work did not address peri-operative care of patients with HIV/AIDS, including the rates of highly active antiretroviral therapy. Further, this work does not address immune system profiles, including presenting white blood cell count, lymphocyte number, or lymphocyte sub-populations that may have affected choice of operative versus non-operative intervention. However, the lack of these markers echoes the sentiments of Yan et al who assert that there should be no delay in offering emergent or urgent surgical care for HIV patients[9] merely to obtain CD4 or HIV viral load testing.

CONCLUSION

Among patients with acute, uncomplicated appendicitis, being HIV/AIDS positive negatively affects the likelihood of undergoing surgical intervention. However, given the fact that patients who do undergo appendectomy have no demonstrable post-operative differences in complications, we contend that HIV-positive status should not deter surgeons from offering definitive care for acute, uncomplicated appendicitis.

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UTPALA BANDY, MD, MPH
DIRECTOR, RHODE ISLAND DEPARTMENT OF HEALTH
COMPILED BY ROSEANN GIORGIANNI, DEPUTY STATE REGISTRAR

Rhode Island Monthly Vital Statistics Report
Provisional Occurrence Data from the Division of Vital Records

VITAL EVENTS	REPORTING PERIOD		
	SEPTEMBER 2022	12 MONTHS ENDING WITH SEPTEMBER 2022	
	Number	Number	Rates
Live Births	930	11,195	10.6*
Deaths	792	11,260	10.6*
Infant Deaths	6	45	4.0#
Neonatal Deaths	6	35	3.1#
Marriages	1,026	6,898	6.5*
Divorces	215	2,598	2.5*

* Rates per 1,000 estimated population
# Rates per 1,000 live births

Underlying Cause of Death Category	REPORTING PERIOD			
	MARCH 2022	12 MONTHS ENDING WITH MARCH 2022		
	Number (a)	Number (a)	Rates (b)	YPLL (c)
Diseases of the Heart	190	2,407	219.3	3,549.5
Malignant Neoplasms	184	2,203	204.2	3,950.0
Cerebrovascular Disease	48	505	46.0	502.5
Injuries (Accident/Suicide/Homicide)	85	1,118	101.9	16,311.5
COPD	40	447	40.7	427.5

(a) Cause of death statistics were derived from the underlying cause of death reported by physicians on death certificates.
(b) Rates per 100,000 estimated population of 1,097,379 for 2020 (www.census.gov)
(c) Years of Potential Life Lost (YPLL).

NOTE: Totals represent vital events, which occurred in Rhode Island for the reporting periods listed above.
Monthly provisional totals should be analyzed with caution because the numbers may be small and subject to seasonal variation.

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Drug Importation from Canada: The Wrong Prescription

ELI Y. ADASHI, MD, MS; DANIEL P. O'MAHONY, MSLS; I. GLENN COHEN, JD

On May 25, 2022, the Center for Drug Evaluation and Research of the U.S. Food & Drug Administration (FDA) released a Guidance for Industry to clarify its Final Rule on the "Importation of Prescription Drugs."[1] Issued by then Secretary of Health and Human Services (HHS) Alex M. Azar II in 2020, the Final Rule sets out the relevant regulations for the "importation of certain prescription drugs from Canada."[2] The stated objective of the Final Rule is "to achieve a significant reduction in the cost of covered products to the American consumer while posing no additional risk to the public's health and safety."[2] In a rare case of concordance with and continuation of a Trump-era initiative, President Biden issued an Executive Order wherein he called on the Commissioner of the FDA to implement the Final Rule and "work with States and Indian Tribes that propose to develop Section 804 [prescription drugs] Importation Programs [SIPs]."[3] In this commentary we review the intricacies of the drug importation program, discuss its relative shortcomings, and propose that it be replaced with a root-cause approach to capping the national prescription drug costs.

Well prior to his election, President Biden pledged to address the ever-escalating U.S. prescription drug costs and to do so through the importation of more affordable Canadian counterparts. To advance this goal, President Biden has recently called on the federal government to work "with states and Tribes to import safe, lower-cost prescription drugs from Canada."[4] Advantage was to be taken of Section 804 of the Federal Food, Drug, and Cosmetic Act (FDCA) which makes it possible for governmental entities (SIP Sponsors), together with pharmacists and wholesalers (SIP Co-Sponsors), if any, to import eligible prescription drugs from Canada for up to two years.[5] To qualify, such prescription drug importation programs must offer a "significant reduction in the cost" to U.S. consumers while guarding against the imposition of any and all risks to the health and safety of the public.[5] Importation-eligible (FDA-compliant) prescription drugs are limited to those that have been approved by the Health Products and Food Branch of Health Canada, the department responsible for federal health policy in Canada.[5] Importation-ineligible prescription drugs include controlled substances, biologics, and medications that are infused, inhaled, or else require intrathecal or intraocular administration.[5] Drugs that are subject to Risk Evaluation and Mitigation Strategy (REMS) are similarly precluded.[5]

States with drug importation laws

At the time of this writing, a total of six states (Colorado, Florida, Maine, New Hampshire, New Mexico, and Vermont) have enacted drug importation laws. A total of five states (North Dakota, Oregon, Utah, West Virginia, and Wyoming) attempted but failed to enact comparable statutes. Other states have yet to act on comparable legislative initiatives which, in some cases, are under the purview of exploratory committees. Federal approval for the importation of drugs from Canada requires that states that have enacted drug importation laws propose a re-importation program for consideration and certification by the Secretary of HHS. It is in this context that FDA and HHS representatives held a recent meeting with state and National Academy for State Health Policy counterparts. Going forward, the FDA will continue to proactively engage with those states that are interested in the development of drug importation programs.

The statutory foundation for the importation of prescription drugs dates back to the Medicine Equity and Drug Safety (MEDS) Act of 2000 (Pub. L. 106-387) wherein the FDCA was amended to include Section 804 titled "Importation of Prescription Drugs." In so doing, the MEDS Act made it possible for U.S.-based pharmacists and drug wholesalers to import prescription drugs from specified countries. Activation of such newly minted importation programs requires the Secretary of HHS to affirm that the programs pose "no additional risk to the public's health and safety" and that they "result in a significant reduction in the cost of covered products to the American consumer." Section 804 of the FDCA was further modified in 2003 by the Medicare Prescription Drug, Improvement, and Modernization Act (MMA) (Pub. L. 108-173) to specify that U.S.-based wholesalers and pharmacists may import prescription drugs only from Canada but not from other industrialized countries.

Challenges to importation of drugs

The plans to remedy the high costs of prescription drugs in the U.S. via the importation of more affordable Canadian counterparts face a number of significant challenges and uncertainties. First, participation by U.S. States and Tribes has proven limited thus far. This reality is borne out by the fact that only six U.S. states have heretofore enacted drug importation statutes. Second, Canadian accedence to the exportation of prescription drugs to the U.S. remains

uncertain. As noted by Justin Trudeau, the Prime Minister of Canada, ensuring the safe and adequate supply of prescription drugs for Canadians is his first priority. The passage of prohibitory legislation by the Parliament of Canada cannot be ruled out as well. Third, the Canadian health care system is given to intermittent prescription drug shortages which could well be exacerbated by the U.S. importation plan. Anticipating just such a contingency, the Canadian government now prohibits the exportation of drugs that could give rise to or exacerbate a prescription drug shortage. Fourth, significant doubts remain as to the capacity of the small Canadian pharmaceutical marketplace to accommodate the demands of its much larger U.S. counterpart. Implementation of the importation plan could well exacerbate drug shortages in Canada. Fifth, consideration must be given to the possibility that the relief anticipated from the importation program may not be realized in that a significant proportion of high-priced prescription drugs are importation-ineligible. Finally, if a significant volume of drugs were imported to Canada, it is possible that the pharmaceutical industry would attempt to reduce its supply to the Canadian market or otherwise disrupt this trade through alterations in packaging or other means.

Conclusion

An importation program from Canada is not a sustainable recipe for capping the homegrown prescription drug costs. Instead, a focused root-cause approach is called for. Reform initiatives along these lines could include international price referencing, bulk discount negotiations, competitive bidding, and value-based pricing. Judging from the experience of other developed nations, combinations of the aforementioned strategies have frequently seen to the reduction of the national prescription drug costs. Oversight by the Federal Trade Commission of anticompetitive practices designed to keep biosimilar generic options off the market must also be enhanced. Four former FDA Commissioners said it best when they urged "Congress and the many others concerned about the cost of drugs to deal directly with the issues driving the cost of medicines and not to place false hope in measures that will place patients who need treatment at risk and jeopardize public health."[6] Whereas any and all reform initiatives are likely to face difficult political headwinds in this Congress and in the foreseeable future, one would be well advised not to pretend that drug importation can substitute for a well-thought-out legislative redress.

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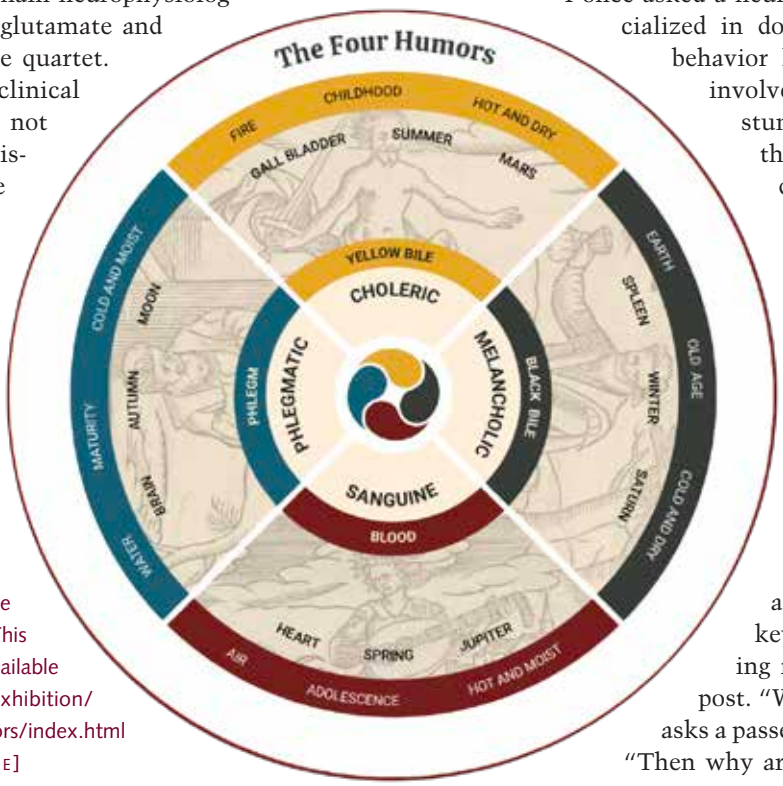
The Four Humors *(Updated for Neurologists)*

JOSEPH H. FRIEDMAN, MD

The four humors of ancient Greek medicine, often credited to Hippocrates (460 BCE to 370 BCE), were: blood, yellow bile, black bile, and phlegm. Two thousand years ago, doctors used them to explain pathophysiology. Cancer was caused by an excess of black bile. What caused the black bile to build up may have been an ill-advised diet, excess work, a passing comet, or not enough sunlight. These days a shortage of vitamin D is seemingly involved in everything from falls, to autoimmune disorders, neurodegenerative disorders, and some cancers. The microbiome has also attracted a lot of attention and, plausibly, may be involved in a large number of disorders, too, or possibly none.

In neurology we have returned to that original ancient Greek conception of the foundation of pathophysiology, the four humors. There is a certain symmetry to this line of thinking and we are inclined to believe that nature likes symmetry. The current four humors are quite different than those our Greek predecessors invoked. With a far more superior sophisticated veneer, we invoke dopamine and serotonin as the two main neurophysiological basics. A soupcon of glutamate and acetylcholine complete the quartet.

I don't think I've read a clinical neurology paper that has not invoked dopamine in the discussion section, where the authors feel obligated to explain the physiology of whatever it is that was observed. In many, if not most, cases, there is little reason to think that their explanations hold water, which is, luckily, not a humor.



The National Library of Medicine has an online exhibit of The Fours Humors, seen through the work of William Shakespeare. This image if from the collection, available at: https://www.nlm.nih.gov/exhibition/shakespeare-and-the-four-humors/index.html [NATIONAL LIBRARY OF MEDICINE]

The authors don't think so either, but feel they must come up with some hypothesis. "Although dopamine levels were increased in rat brains after a 3-month exposure to drug X, they were decreased after 2 months in mouse brains, perhaps explaining why the findings in our rabbit experiments were highly varied…"

Dopamine is ubiquitous in the brain. Of course, it is crucial in Parkinson's disease, my own niche, but has also been a focus in schizophrenia, since drugs that block dopamine activity have been found to be helpful in treating some psychotic symptoms. However, it is also apparently involved in obsessive compulsive disorders, addiction, depression, learning, and virtually anything else you can name. Consider a recent statement in an unpublished manuscript under review: "Patients with Parkinson's disease (PD) may be at a higher risk of developing neuropsychiatric symptoms because they have difficulties adapting to a drastic change in the environment due to impaired functioning of the dopaminergic system."

I once asked a neuropharmacologist who specialized in dopamine if there was any behavior he knew of that did not involve dopamine and he was stumped. Not one could he think of, which is not to say dopamine isn't involved in every one of them. I suspect it is. The brain is, in some ways, like a clock, but instead of stopping when one piece in a thousand stops working, it speeds up or slows down. Whenever I see dopamine invoked to explain some outcome, I always think of the joke about the inebriated man who lost his car keys at night and is searching fruitlessly under the lamp post. "Where did you drop them?" asks a passerby. "Over there," he says. "Then why are you looking over here?"

"Because the light is better."

I am not saying dopamine isn't involved in most, if not all, behaviors. I think that we often fool ourselves into thinking we know more than we do by using technical jargon and applying principles that are terribly over-simplistic. When I read that perturbations in one part of the nervous system are associated with, or provoke changes in dopamine somewhere else, I think of the very old children's song, "The Skeleton Dance": "The thigh bone's connected to the hip bone..." In the brain, as in the skeleton, everything is connected to everything else.

I am not trying to demean my research colleagues. Well, yes I am, but only a little. As a clinician and clinical researcher, who now does more peer reviewing than writing, I think it important for us clinicians to understand the famous warning from former Secretary of Defense Donald Rumsfeld about distinguishing the known unknowns and the unknown unknowns. He was talking about the military and defense, but the warning applies to all questions. My concern is avoiding the complacency that comes with thinking you understand something that you don't, because you use technical jargon to obfuscate that lack of knowledge. I have rarely reviewed a paper that made a clinical observation, put that observation into an appropriate, and possibly important context, usually something along the line of "be aware of this rare problem in this disorder," and did not then state that they had no factual basis for inferring a pathophysiological explanation and refrained from doing so. Most papers will, instead, write more about the various theoretically possible explanations, usually based on a case report, an animal experiment, and/or a biochemical study of something different but related. I generally recommend acceptance or rejection of the manuscript based on the material before the discussion hypotheticals and ask the authors to markedly reduce their esoteric but imaginative speculations. Unfortunately, this isn't the usual outcome.

There was a neurological paper published decades ago that became famous, not so much because of its importance, although it certainly provided enormous help to a very small number of people, but because of its humility. In describing the first, and still only, effective symptomatic treatment for the rare inherited disorder, Episodic Ataxia type 2 (EA2), the author wrote that he had been contacted by phone, at night, about a child admitted with presumed hypokalemic periodic paralysis. The child was treated with acetazolamide, as was appropriate, and improved. The next day, the pediatric neurologists met the child for the first time, changed the diagnosis to the correct one, EA2, and described their discovery as "serendipitous," based on a mistake. I wonder how many of us would do this today, and would a journal welcome such an admission? ❖

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Access to Health Coverage, Parity Compliance May Help Improve Youth Mental Health Services

MITCHELL BERGER, MPH

Dr. Samantha Rosenthal and others writing in the April *Rhode Island Medical Journal* eloquently review the state of youth mental health services at the state and national levels.[1] One important area not emphasized is that of health coverage. Adequate health coverage through Medicare, Medicaid, and commercial insurance and commitment to the federal Mental Health Parity and Addiction Equity Act (MHPAEA) and state-level parity laws can help to ensure access to behavioral health care for those of all ages and reduce disparities.

Progress has been made in recent years, but at the end of 2022 roughly 10 percent of non-elderly Americans, including 5 percent of children, still lacked health coverage.[2] The conclusion/unwinding of the COVID-19 public health emergency, which helped enhance health coverage, may exacerbate this trend. Many who do have health coverage are underinsured, facing high out-of-pocket costs such as high co-pays and deductibles.[3] Lack of health care coverage and cost/affordability are key reasons many Americans of all ages cannot obtain needed care both for mental health conditions and substance use disorders.[4]

MHPAEA enforcement also is important to ensure that once health coverage is obtained, coverage for behavioral health services is equivalent to that provided for other health conditions. The recently released National Drug Control Strategy observes that: "Insufficient insurance coverage, provider reimbursement rates that do not cover activities required to sustain a practice, and non-compliance with federal parity laws requiring certain insurance plans to provide comparable coverage of physical and behavioral health services all may impact access to treatment as well as whether people can succeed in treatment."[5]

As the nation recovers from COVID-19, a renewed commitment to health coverage, including behavioral health parity, can enrich the lives of millions of Americans, young and old, and support access to essential behavioral health care and services. ❖

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Disclaimer

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Kenneth S. Korr, MD, RIMJ Associate Editor, checks the latest issue of RIMJ while viewing a painting by John Singer Sargent titled "Hospital at Granada" (1912) at the Sargent & Spain exhibition, on display through May 14th. [MARY KORR]

SAN FRANCISCO, CALIFORNIA

Sargent & Spain

The Fine Arts Museums of San Francisco is holding an exhibition, Sargent & Spain, at the Legion of Honor Museum, which explores the influence of Spanish culture on the dynamic visual practice of the American expatriate artist John Singer Sargent (1856–1925).

Sargent was born in Florence, Italy, to American parents, and traveled to Spain from his homes in Paris (1874–1882) and London (1882–1925). The exhibition presents an array of Sargent's dazzling oils, watercolors, drawings, and never-before-exhibited photographs from his personal collection, which explore Spain's rich culture (both historic and modern), its people, and its magnificent urban and rural landscapes.

Installation view of Sargent & Spain, Legion of Honor, San Francisco, 2023. [GARY SEXTON. COURTESY OF THE FINE ARTS MUSEUMS OF SAN FRANCISCO.]

The Legion of Honor Museum in Lincoln Park, San Francisco. [COURTESY OF THE FINE ARTS MUSEUMS OF SAN FRANCISCO]

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Working for You: RIMS advocacy activities

April 3, Monday

RIMS Board meeting: **Thomas Bledsoe, MD**, President

Protect our Health Care Policy Group: Stacy Paterno, staff

April 4, Tuesday

RIMS Physician Health Committee (PHC): **Herb Rakatansky, MD**, Chair

Blue Cross & Blue Shield of Rhode Island Quarterly Meeting: **Thomas Bledsoe, MD**, President; **Heather Smith, MD**, President-elect

RIMS Finance Committee: **Matthew Smith, MD**, Chair

April 6, Thursday

AMA Health Equity Webinar: Stacy Paterno, staff

April 7, Friday

New Hampshire Medical Society: Stacy Paterno, staff

April 12, Wednesday

Board of Medical Licensure and Discipline: Stacy Paterno, staff

Neighborhood Health Plan of Rhode Island Quarterly Meeting: **Thomas Bledsoe, MD**, President; **Heather Smith, MD**, President-elect

AMA Medicare Physician Payment Reform Webinar: Stacy Paterno, staff

Health Professions Loan Repayment Board Meeting: Stacy Paterno, staff

April 13, Thursday

CTC-RI Prior Authorization Steering Committee: **Peter Hollmann, MD**, Chair; **Elizabeth Lange, MD**, Past President; Stacy Paterno, staff

April 13, Thursday

RIMS Nominations Committee: **Heather Smith, MD**, Chair

RIMS Award Committee: **Kara Stavros, MD**, Chair

April 17, Monday

Protect our Health Care Policy Group: Stacy Paterno, staff

RIMS Public Laws Committee Meeting: **Michael Migliori, MD**, Chair

April 18, Tuesday

National Government Services Key Stakeholder Meeting: Stacy Paterno, staff

April 19, Wednesday

Primary Care Physician Advisory Committee: **Elizabeth Lange, MD**, Past President

Rhode Island Foundation Long-term Health Planning Committee: Stacy Paterno, staff

April 20, Thursday

RIMS Climate Change & Health Committee: **Alison Hayward, MD**, Chair

April 24, Monday

Combined Career Ladders Advisory Workgroup: Stacy Paterno, staff

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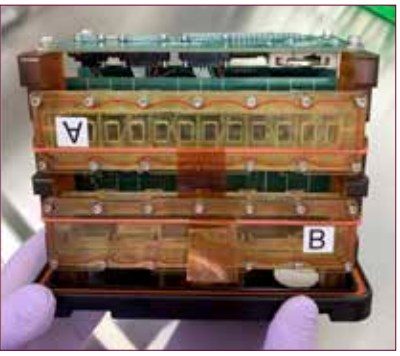
For more information about group rates, please contact Ali Walz, RIMS Director of Member Services

Heart tissue sent to International Space Station in March returns, under analysis

MARY KORR
RIMJ MANAGING EDITOR

Johns Hopkins Medicine researchers and a Brown physician researcher are part of a multi-institution team that collaborated with NASA to send human heart "tissue-on-a-chip" specimens into space in March. The tissue samples were launched aboard SpaceX CRS-27, a resupply mission to the International Space Station (ISS), from NASA's Kennedy Space Center in Florida.

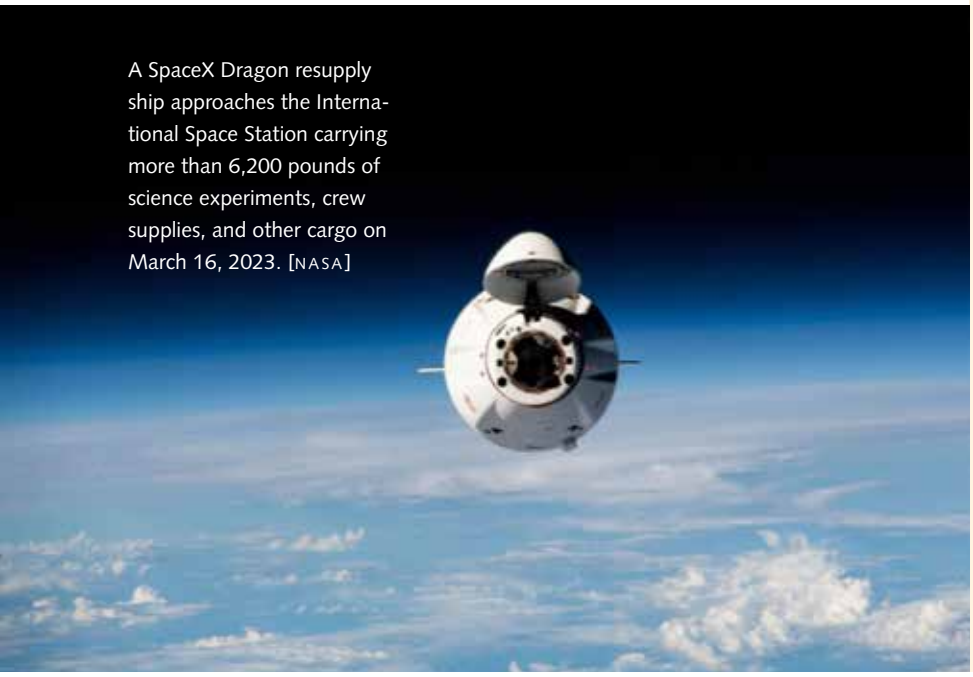


Tissue chambers loaded into a plate habitat designed for research aboard the International Space Station. [DEOK-HO KIM AND DEVIN MAIR, JOHNS HOPKINS MEDICINE]

The heart tissue samples returned to Earth in mid-April and are being processed and analyzed for further study by Johns Hopkins researchers in laboratories at Johns Hopkins All Children's Hospital in St. Petersburg, Florida.

The project was designed to monitor the tissue for changes in heart muscle cells' mitochondria and ability to contract in low-gravity conditions. Astronauts on board during the mission introduced three FDA-approved medicines to the samples in efforts to prevent heart cell changes known or suspected to occur in those undertaking long-duration spaceflights.

"It's possible that what we learn from these experiments in space could also inform how we treat age-related cardiac problems," said **DEOK-HO KIM, PhD**, professor of biomedical engineering at the Johns Hopkins University School of Medicine, "because many heart cellular changes already detected in space explorers mimic changes linked to heart muscle aging in general."



A SpaceX Dragon resupply ship approaches the International Space Station carrying more than 6,200 pounds of science experiments, crew supplies, and other cargo on March 16, 2023. [NASA]

Science Experiments Summary

Among the science experiments the unmanned cargo ship Dragon delivered to the space station for NASA and its partners were:

3D Heart Cells, Tissue

The first **Cardinal Heart** investigation conducted aboard the space station showed that four weeks of microgravity exposure can cause significant changes in heart cell function and gene expression. Researchers concluded that these changes could lead to long-term medical issues. The **Cardinal Heart 2.0** experiment builds on these results, using heart organoids, 3D structures made up of all the different types of cells, to test whether clinically approved drugs reduce these microgravity-induced changes in heart cell function. Results could support the development of effective drug combinations to improve the health of astronauts and patients on Earth.

Astronaut **Sultan AlNeyadi** posted this photo on Twitter, which shows the Minus Eighty-Degree Laboratory Freezer (MELFI), that can reach temperatures as low as –100°C, to preserve some of the research samples.

The **Engineered Heart Tissues-2** study continues work with 3D cultured cardiac muscle tissue to assess human cardiac function in microgravity. Previous work with 3D cultures in space detected changes at the cellular and tissue level that could provide early indication of the development of cardiac disease. This investigation tests whether new therapies prevent these adverse spaceflight effects from occurring. The model used in this study has potential use in drug development and other applications related to diagnosing and treating cardiac dysfunction on Earth.

Cardinal Heart 2.0 and Engineered Heart Tissues-2 are the final two experiments comprising the National Institutes for Health and International Space Station National Lab's Tissue Chips in Space initiative. Researchers hope to learn more about the impact of microgravity on human health and disease, and translate that understanding to improved human health on Earth. ❖

In Fall River, MA, Southcoast Health cardiothoracic surgeon and Brown University Assistant Professor of Pathology and Laboratory Medicine (Research) **PETER H.U. LEE, MD, PhD**, who has served on the Science Subcommittee of the ISS National Laboratory, was a participant in the study. RIMJ posed a few questions to Dr. Lee, who was in Houston last week giving a talk at the NASA Johnson Space Center.

Peter H.U. Lee, MD, PhD [SOUTHCOAST HEALTH]

RIMJ: Were you involved as a collaborator with the researchers at Johns Hopkins, NASA, and the NIH with this particular science experiment and is it a continuation of earlier ones sent to the space station?

DR. LEE: For this project, I have been a co-investigator with Dr. Deok-Ho Kim at JHU being the Principal Investigator. At the time of the application, I was the only team member with experience doing spaceflight experiments. The original grant began with our 2020 space station experiment and this last one was a follow-up to the first one.

RIMJ: Post-splashdown, the experiment is now under analysis. When can the results be expected and what is your expectation?

DR. LEE: Typically, it should take 3-6 months for the samples to be processed and analyzed. Hopefully, we will be able to publish our results within about a year from now, ideally sooner.

Research with these beating 3D engineered heart tissues allows us to study the effects of spaceflight on the heart in a culture dish, thereby reducing the reliance on animal studies. As a cardiac surgeon, I am hopeful that these studies will also help address heart disease for patients on Earth.

RIMJ: Did you watch the lift-off and splashdown? That must be very exciting for an investigator to see.

DR. LEE: This was my fourth International Space Station experiment but unfortunately, also the first one I wasn't able to see the launch for. In additional to the 4 ISS experiments, I had an experiment launch with Blue Origin in the past 10 years. Prior to that, I have been part of numerous experiments with the space shuttle, parabolic (zero gravity) flights, and Russian biosatellites. ❖

A SpaceX Falcon 9 rocket soars upward after its liftoff from Launch Complex 39A at NASA's Kennedy Space Center in Florida on March 14, 2023, on the company's 27th Commercial Resupply Services mission for the agency to the International Space Station. Liftoff was at 8:30 p.m. EDT. The Dragon spacecraft delivered more than 6,000 pounds of science and research, supplies, and equipment to the crew aboard the space station, including the final two experiments comprising the National Institutes for Health and International Space Station National Laboratory's Tissue Chips in Space initiative, Cardinal Heart 2.0 and Engineered Heart Tissues-2. [NASA]

FDA authorizes changes to simplify use of bivalent mRNA COVID-19 vaccines

WASHINGTON, DC – On April 18, the U.S. Food and Drug Administration amended the emergency use authorizations (EUAs) of the Moderna and Pfizer-BioNTech COVID-19 bivalent mRNA vaccines to simplify the vaccination schedule for most individuals. This action includes authorizing the current bivalent vaccines (original and omicron BA.4/BA.5 strains) to be used for all doses administered to individuals 6 months of age and older, including for an additional dose or doses for certain populations. The monovalent Moderna and Pfizer-BioNTech COVID-19 vaccines are no longer authorized for use in the United States.

Changes

- Most individuals, depending on age, previously vaccinated with a monovalent COVID-19 vaccine who have not yet received a dose of a bivalent vaccine may receive a single dose of a bivalent vaccine.
- Most individuals who have already received a single dose of the bivalent vaccine are not currently eligible for another dose. The FDA intends to make decisions about future vaccination after receiving recommendations on the fall strain composition at an FDA advisory committee in June.
- Individuals 65 years of age and older who have received a single dose of a bivalent vaccine may receive one additional dose at least four months following their initial bivalent dose.
- Most individuals with certain kinds of immunocompromise who have received a bivalent COVID-19 vaccine may receive a single additional dose of a bivalent COVID-19 vaccine at least 2 months following a dose of a bivalent COVID-19 vaccine, and additional doses may be administered at the discretion of, and at intervals determined by, their healthcare provider. However, for immunocompromised individuals 6 months through 4 years of age, eligibility for additional doses will depend on the vaccine previously received.
- Most unvaccinated individuals may receive a single dose of a bivalent vaccine, rather than multiple doses of the original monovalent mRNA vaccines.
- Children 6 months through 5 years of age who are unvaccinated may receive a two-dose series of the Moderna bivalent vaccine (6 months through 5 years of age) OR a three-dose series of the Pfizer-BioNTech bivalent vaccine (6 months through 4 years of age). Children who are 5 years of age may receive two doses of the Moderna bivalent vaccine or a single dose of the Pfizer-BioNTech bivalent vaccine.
- Children 6 months through 5 years of age who have received one, two or three doses of a monovalent COVID-19 vaccine may receive a bivalent vaccine, but the number of doses that they receive will depend on the vaccine and their vaccination history.

Available data show that almost all of the U.S. population 5 years of age and older now have antibodies as a result of either vaccination or infection against SARS-CoV-2. The use of bivalent COVID-19 vaccines for all doses administered to individuals 6 months of age and older is supported by the data described below, as well as post-marketing data, including real-world data, with the monovalent and bivalent mRNA COVID-19 vaccines, which have been administered to millions of people, including young children. A second bivalent dose for individuals 65 years of age and older is supported by data showing the waning of immunity in this population over time and its restoration by an additional dose. Additionally, based on evidence from studies conducted previously, immunocompromised individuals may require additional doses.

Vaccines and Related Biological Products Advisory Committee

The latest authorizations follow discussions that occurred during a meeting with the FDA's Vaccines and Related Biological Products Advisory Committee (VRBPAC) on Jan. 26. At that time, by a unanimous vote, the committee recommended harmonizing the strain composition of COVID-19 vaccines used in the U.S. There was also support for simplifying the vaccine dosing schedule.

In June, the FDA will hold a meeting of its VRBPAC to discuss the strain composition of the COVID-19 vaccines for fall of 2023. Much like the FDA does yearly with the influenza vaccines, the agency will seek input from the committee on which SARS-CoV-2 variants and lineages are most likely to circulate in the upcoming year. Once the specific strains are selected for the COVID-19 vaccines, the FDA expects manufacturers to make updated formulations of the vaccines for availability this fall.

The amendments to the EUAs were issued to ModernaTX Inc. and Pfizer Inc. ❖

American Lung Association releases 2023 State of the Air report

PROVIDENCE – Providence's air quality has seen improved levels of ozone pollution since last year's report, according to the American Lung Association's 2023 State of the Air report, which was released in April. For the first time, the metro area received a passing grade for ozone pollution, under the current standard. The report also found several counties throughout the state of Rhode Island received improved grades for ozone pollution, while receiving worsened grades for particle pollution.

The Lung Association's 24th annual report grades Americans' exposure to unhealthy levels of ground-level ozone air pollution, annual particle pollution and short-term spikes in particle pollution over a three-year period. This year's report covers 2019–2021.

"Here in Rhode Island and across the nation, we are seeing ozone pollution improving, thanks in big part to the success of the Clean Air Act. But there is more work to do," said **DAN FITZGERALD**, Director of Advocacy for the Lung Association. "Even one poor air quality day is one too many for our residents at highest risk, such as children, older adults, individuals who are pregnant, and those living with chronic disease. That's why we are calling on Governor McKee and the General Assembly to continue to take action to ensure that everyone has clean air to breathe. The Lung Association calls on Rhode Island lawmakers to meet the benchmarks set forth by the Act on Climate, reduce greenhouse gas emissions, and ensure a transition to zero-emission transportation."

Nationally, the report found that ozone pollution has generally improved across the nation, thanks in large part to the success of the Clean Air Act. However, more work remains to fully clean up harmful pollution, and short-term particle pollution continues to get worse. In addition, some communities bear a greater burden of air pollution. Out of the nearly 120 million people who live in areas with unhealthy air quality, a disproportionate number – more than 64 million (54%) – are people of color. In fact, people of color were 64% more likely than white people to live in a county with a failing grade for at least one measure, and 3.7 times as likely to live in a county with a failing grade for all three measures.

Ground-level ozone pollution

Compared to the 2022 report, the Providence metro area experienced fewer unhealthy days of high ozone in this year's report. "State of the Air" ranked Providence as the 52nd most polluted city for ozone pollution, which is better compared to its ranking of 47 in last year's report. Several counties also saw grades improve for ozone pollution, including Kent (from a D to a C), and Providence (from an F to a C),

Particle pollution

The report also tracked short-term spikes in particle pollution, which can be extremely dangerous and even deadly. Providence's short-term particle pollution worsened in this year's report, which means there were more unhealthy days. The area is tied for 95th most polluted for short-term particle pollution. Ten out of twelve counties in the metro area received B grades for short-term particle pollution this year after receiving A grades last year.

See the full report results at Lung.org/SOTA. ❖

Populations at Risk

County	Total Pop	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Cardio-vascular Disease	Pregnancy	Poverty Estimate	Non White
Bristol	50,818	9,202	10,488	607	5,253	2,533	33	3,299	451	3,611	4,889
Kent	170,715	31,451	33,783	2,075	17,602	8,375	109	10,812	1,501	13,635	23,984
Newport	85,264	13,820	20,151	912	8,981	4,463	55	5,964	707	7,899	12,664
Providence	658,221	133,834	105,211	8,828	66,630	29,103	422	35,998	6,572	90,405	270,169
Washington	130,592	20,520	29,158	1,354	13,869	6,743	84	8,882	1,160	11,421	12,499
TOTAL:	**1,095,610**	**208,827**	**198,791**	**13,776**	**112,335**	**51,217**	**703**	**64,955**	**10,391**	**126,971**	**324,205**

Country's first state-regulated overdose prevention center slated to open in early 2024

PROVIDENCE – Project Weber/RENEW, in partnership with CODAC Behavioral Healthcare, recently announced that it will open the country's first state-regulated overdose prevention center in early 2024. The center, which will be located in Providence, will prevent overdose deaths and provide critically needed services, including the ability to use pre-obtained drugs under the supervision of trained staff. The surging overdose epidemic claimed a record high 435 lives in Rhode Island in 2021.

Funding for the center's first year of operations comes from opioid settlement funds distributed to Rhode Island, totaling $2.6 million. Project Weber/RENEW and clinical partners CODAC were selected for the project by the state's Executive Office of Health and Human Services.

"This is a historic and humane step forward in the fight against the epidemic of overdose deaths," Project Weber/RENEW Executive Director **COLLEEN DALEY NDOYE** says. "With more than 100,000 people dying in this country every year – and hundreds in Rhode Island alone – it is time for us to take action to keep more people from dying. No one can make the decision to ask for support and help, let alone decide to enter treatment or recovery if they are dead. We have many years of experience as a peer-led organization, and we're ready to make Rhode Island a leader in a new era of harm reduction."

Overdose prevention centers (sometimes referred to as "safe consumption sites" or "harm reduction centers") offer an array of services under one roof – almost all of which are already offered at Project Weber/RENEW's current drop-in centers in Providence and Pawtucket. These include: access to basic needs such as food, water, and hygiene products; safer use supplies and Narcan/naloxone; case-management services, HIV and hepatitis C testing and linkage to care; housing support; peer recovery coaching; and support groups; among others.

Additionally, the overdose prevention center will also allow people to use pre-obtained substances under the supervision of trained professionals. Staff will make sure every individual has the opportunity to test their drugs for fentanyl and other substances and will also be on hand to make sure someone does not overdose or to help reverse an overdose. When a potential overdose is spotted early, it can be quickly and effectively reversed.

Legislation that authorized the creation of an overdose prevention center in Rhode Island was recently amended and passed by the state legislature. These vital bills were sponsored by Rhode Island State Senator **JOSH MILLER** and State Representative **JAY EDWARDS**. That law will now sunset in March 2026, allowing for the time needed to get the facility open, operating, and evaluated.

Data has shown that no one has ever died at an overdose prevention center anywhere in the world in the many decades they've existed. Recent data from the two overdose prevention centers operating in New York City show that they reversed more than 600 overdoses in their first year of operation, with only a handful needing EMS services.

Regulation, evaluation

The Rhode Island Department of Health will regulate the overdose prevention center through a comprehensive set of requirements. A rigorous evaluation will be conducted by The People, Place & Health Collective at Brown University's School of Public Health to measure the program's individual and community outcomes. Researchers at the Collective have combined decades of experience evaluating harm reduction interventions, including overdose prevention centers in other countries. Project Weber/RENEW Deputy Director **ASHLEY PERRY** and Overdose Prevention Program Director **DENNIS BAILER**, both people with lived experience, will be co-directors of the space.

"It's impossible to overstate how important an overdose prevention center is. It will help save so many lives!" says Bailer. "People die when they use alone, and they don't have to be alone. More people are dying now than ever before because the entire illicit drug supply is contaminated with fentanyl and other drugs. Overdoses are also now skyrocketing in our Black and Brown communities. It's imperative that we do what we can to help keep people alive, and right now that starts by opening spaces like this overdose prevention center."

The proposed location for the center is on Huntington Avenue in Providence, which is an overdose hotspot with no direct residential neighbors. The center, which will be open on weekdays, will be staffed by Project Weber/RENEW and CODAC, the state's largest provider of nonprofit outpatient services for opioid use disorder. Staff will include experts with lived experience, including peer recovery specialists, nurse practitioners, and doctors who can prescribe suboxone and methadone.

Project Weber/RENEW and CODAC have begun reaching out to residents and stakeholders directly about the project. Both organizations are committed to working closely with state, local and community leaders ahead of and during the center's operation.

"CODAC is excited and honored to partner with Project Weber/RENEW on this initiative," CODAC CEO **LINDA HURLEY** says. "The work of the overdose prevention center is evidence-based, proven to save lives. It is a critical piece of the continuum of care needed to assist and protect our community members who are suffering from substance use disorders." ❖

Governor McKee update on access to Mifepristone in Rhode Island

PROVIDENCE – Governor Dan McKee issued the following update about access to Mifepristone in Rhode Island on April 17th:

"The State of Rhode Island is fortunate to have strong protections in place for reproductive freedom that other states may not have. Despite the federal court ruling in Texas, access to safe reproductive health care like Mifepristone remains legal in Rhode Island. Here in Rhode Island, our Administration is working to ensure continued access to care, which is available through ample supply of medication and surgical means.

Last week, I directed the Rhode Island Department of Health (RIDOH) to conduct outreach to health care facilities in Rhode Island to ensure sufficient inventory and that Mifepristone continues to remain accessible. There is a sufficient amount of Mifepristone in Rhode Island at this time. However, RIDOH remains in regular contact with our health care facilities to ensure that patients do not experience any challenges accessing medication and care.

RIDOH has also issued a formal advisory to Rhode Island providers reiterating that there should be no changes in clinical practice for the prescribing, dispensing, and administration of Mifepristone, or any other reproductive health medication, in Rhode Island at this time.

Our Executive Office of Health and Human Services (EOHHS) has conducted outreach to our three contracted Medicaid Managed Care Organizations (Neighborhood Health Plan of Rhode Island, UnitedHealthcare of New England and Tufts Health Public Plans) that currently serve one out of every three Rhode Islanders, to ensure continued access to Mifepristone under current rules and regulations allowed under the Medicaid Program. Additionally, EOHHS is continuing to share important updates with community partners and advocates to ease concerns or confusion given the various federal court rulings related to Mifepristone access.

My team will continue to stay connected with the Biden Administration and the coalition of Governors focused on protecting these rights. I've directed my legal team to monitor the progress of both the Washington and Texas cases closely. We will also continue working with providers like Planned Parenthood of Southern New England, who have been strong partners in navigating this effort and ensuring continued access in our state." ❖

RIDOH, CDC highlight STI data

Rates of STIs are increasing

PROVIDENCE – The Centers for Disease Control and Prevention (CDC) recently released their 2021 Sexually Transmitted Disease (STD) Surveillance. The annual report shows STI rates continued to increase, with more than 2.5 million new cases of chlamydia, gonorrhea, and syphilis identified in the United States in 2021. RIDOH released its annual 2021 Rhode Island HIV, Sexually Transmitted Infections, Viral Hepatitis, and Tuberculosis Surveillance Report in February.

"While there is no one reason why rates of STIs are increasing, some factors may be sexual activity with larger networks of partners, substance abuse, and social and economic disparities that limit access to healthcare. In addition, biomedical interventions to prevent HIV and pregnancy may create the incorrect perception that condoms are not needed as much as they were in the past," said **UTPALA BANDY, MD, MPH**, RIDOH Interim Director. "Long-acting injectable contraceptives and pre-exposure medications to reduce your chances of getting HIV (also known as pre-exposure prophylaxis, or PrEP) do not protect against STIs. Fortunately, Rhode Island is a national leader in launching innovative programs to increase access to condoms and testing. These programs can help Rhode Islanders stay health and safe during this time of rapidly increasing STI rates."

The RIDOH and CDC STI surveillance reports indicate:

- From 2012–2021, there has been a 21% increase in chlamydia cases in Rhode Island, from 4,313 cases in 2012 to 5,199 cases in 2021. Nationwide, 1.6 million chlamydia infections were reported in 2021. Most chlamydia cases in the last 10 years have been diagnosed in females. In 2021, nearly twice as many cases were diagnosed in females than in males in Rhode Island. This difference is likely due to two factors. First, women generally access routine healthcare and subsequent screening more frequently than men and are screened for chlamydia more often. Second, men who have chlamydia often do not have symptoms and do not seek healthcare for screening and treatment. From 2017-2021, the highest rates of chlamydia were in people in their 20s, followed by people ages 30–39 and those age 19 or younger.
- From 2012–2021, there has been a 232% increase in gonorrhea cases in Rhode Island, from 507 cases in 2012 to 1681 cases in 2021. More than 700,000 gonorrhea cases were reported nationwide in 2021. In the last 10 years, more gonorrhea cases have been observed in males than in females. In the last five years, case rates for gonorrhea have been consistently highest among people in their 20s, followed by people in their 30s.
- From 2012–2021, there has been a 382% increase in infectious syphilis cases in Rhode Island, from 68 cases in 2012 to 328 cases in 2021. Reported cases of syphilis (all stages) totaled more than 176,000 cases nationwide in 2021. These data represent diagnosed cases based on positive test results and history. In 2021, more cases of infectious syphilis were observed among females compared to prior years; however, males still account for the majority of the reported cases reported. Gay, bisexual, and other men who have sex with men (GBMSM) are disproportionately affected by STIs, including infectious syphilis in Rhode Island, a trend that is also observed nationally.
- In the last two years, RIDOH received its first reports of congenital syphilis in over 10 years. Congenital syphilis continued to surge nationwide in 2021, increasing 203 percent since 2017. In 2021, 38 jurisdictions, including 37 states and the District of Columbia, reported an increase in congenital syphilis cases. ❖

W&I researchers present clinical trial results at Society of Gynecologic Oncology annual meeting

PROVIDENCE – The results of two clinical trials that now define the new standard of care for women with advanced-stage or recurrent endometrial cancer were presented at the recent Society of Gynecologic Oncology annual meeting.

These trials demonstrated that adding immunotherapy to standard cytotoxic chemotherapy improved progression-free survival until cancer recurred, and early results suggested a long-term survival benefit.

"Treatment options for women with advanced endometrial cancer represent a true unmet need in our discipline. The ability to participate in these efforts is part of our commitment to improving outcomes for these patients," said **DR. ASHLEY STUCKEY**. She is an Associate Professor in the Division of Gynecologic Oncology and the Department of Obstetrics and Gynecology at Women and Infants Hospital, The Warren Alpert Medical School of Brown University, and a faculty member at the Legorreta Cancer Center as well as a co-author on Dostarlimab for Primary Advanced or Recurrent Endometrial Cancer, recently published in the *New England Journal of Medicine* on March 27.

DR. CARA MATHEWS said, "There has been a great deal of enthusiasm for newer treatment options in cancer, such as immunotherapy, although positive trial results have been lacking in gynecologic cancer." Dr. Mathews is a co-author of Pembrolizumab plus Chemotherapy in Advanced Endometrial Cancer, also published in the *New England Journal of Medicine*. She is an Associate Professor in the Division of Gynecologic Oncology and the Department of Obstetrics and Gynecology at Women and Infants Hospital and a faculty member at the Legorreta Cancer Center at Brown University.

Dr. Mathews also provided an encore presentation of Overall Survival with Maintenance Olaparib at a 7-year Follow-Up in Patients with Newly Diagnosed Advanced Ovarian Cancer and a BRCA Mutation: The SOLO1/GOG 3004 Trial. These results were initially presented by **DR. PAUL DISILVESTRO**, the Director of the Program in Women's Oncology and a Professor in the Division of Gynecologic Oncology and the Department of Obstetrics and Gynecology at Women and Infants Hospital and a member of the Legorreta Cancer Center at Brown University at the European Society of Medical Oncology Annual Meeting in Paris, France, in September 2022.

Dr. DiSilvestro, the primary author of this manuscript which was published in the *Journal of Clinical Oncology* in September 2022 said, "This trial previously demonstrated that the use of olaparib for these patients dramatically lengthened remission. The long-term results now indicate that this treatment likely cures a substantial portion of women with advanced ovarian cancer and a BRCA mutation. This is groundbreaking for our discipline." ❖

University Orthopedics' Dr. Derek Jenkins to introduce hip implant to region

EAST PROVIDENCE – University Orthopedics adult reconstruction surgeon **DR. DEREK JENKINS** recently became the first in New England to use EMPHASYS™ for a total hip replacement surgery.

"I'm honored that Depuy-Synthes and Johnson & Johnson, a global leader in hip and knee replacement technology, would choose our practice to showcase their newest innovations," said Dr. Jenkins, a senior member of the surgical staff involved in joint replacement research. "Our reputation at University Orthopedics, Brown University, Rhode Island Hospital, and The Miriam Hospital is being noticed on the national level. We may be the smallest state but we are doing big things here in Rhode Island."

The EMPHASYS™ stem by DePuy Synthes, the orthopaedics company of Johnson & Johnson, builds on the long and distinguished track record of the CORAIL™ hip stem, with which Dr. Jenkins has had success in more than 2000 hip replacements over the span of 10 years.

"Our preliminary survey of our total hip replacement results with the CORAIL™ shows a 0% dislocation rate which is really exceptional. We are currently studying outcomes of these newer stem designs, and are excited to be part of the innovation process and what it could mean for our patients," he said.

Keeping many of the same design features that have made the CORAIL™ system a success, Depuy-Synthes called EMPHASYS™ Hip Solutions the next evolution. Some of the improvements the company highlights include:

- A wider variety of stem sizes to accommodate different-sized femurs
- Better fit and surgical preparation for a variety of femur types, including narrow canals
- Better bone preservation due to its intraosseus and extra-osseus design design
- Reduction of the number of implants, instruments, and trays, creating a streamlined workflow specific to a surgeon's preferred surgical approach, including Anterior Approach
- Better recreation of the femoral head center which can lead to ideal positioning of the acetabulum and femur to achieve desired patient leg length outcomes ❖

Center for Innovative Neurotechnology for Neural Repair present groundbreaking research to U.S. Congress

PROVIDENCE – Intelligent Spine Interface (ISI) researchers **DAVID BORTON, PhD**, principle investigator and associate professor of engineering and brain science at Brown University, associate professor of neurosurgery at Lifespan, and Biomedical Engineer at the Providence VA Health care Center for Neurotechnology and Neurorestoration (CfNN), and **JARED FRIDLEY, MD**, associate professor of neurosurgery at The Warren Alpert Medical School at Brown University and a neurosurgeon at Lifespan's Norman Prince Spine Institute (NPSI), were invited to present their research to the U.S. Congress at the Defense Advanced Research Projects Agency's (DARPA) 2023 Demo Day. They are one of less than ten teams chosen to share their work. The clinical trial designed to test the ISI is sponsored by Rhode Island Hospital, with both DARPA and the Veterans Affairs Medical Center (VAMC) collaborating.

The Intelligent Spine Interface (ISI) is a groundbreaking clinical trial aimed at restoring limb movement, sensation and bladder control in individuals who have suffered spinal cord injuries using an implant developed by the Center for Innovative Neurotechnology for Neural Repair (CINNR), a one-of-a-kind lab space in Providence. Borton and Fridley are testing whether the implanted ISI device can be seamlessly integrated into the body's nervous system, helping to bridge the gap in neural circuitry resulting from a spinal injury.

David Borton, PhD

Jared Fridley, MD

"Our hope is that by using machine learning, while restoring the two-way signal flow from limbs to brain and bridging the gap of injury, we can gain a life-changing understanding and a real clinical tool to aid patients with spinal cord injury," said Dr. Fridley. "Better understanding these neural networks would be a groundbreaking step."

"We know that circuits around a spinal lesion often remain active and functional," said Dr. Borton. "We're taking the signals out of the body from those functional circuits, translating them through advanced neural networks, then sending them to the other side of the lesion, in a bi-directional way."

Researchers presented their work in Washington, D.C. on April 18 to the U.S. Senate and on April 19 to the U.S. House of Representatives. ❖

Fatima Hospital now offering Inspire sleep apnea treatment

NORTH PROVIDENCE – Fatima Hospital is now offering Inspire therapy, a breakthrough obstructive sleep apnea (OSA) treatment option for those who cannot use Continuous Positive Airway Pressure (CPAP) therapy.

DR. JOHN TARRO, an otolaryngologist, performed the first case at Fatima. **DR. ZACHARY QUAY-DE-LA VALLEE** and **DR. C. IAN NEWBERRY**, all of RI ENT Physicians in Providence, are also trained in the procedure.

Inspire works inside the body with a patient's natural breathing process to treat sleep apnea. Mild stimulation opens the airway during sleep, allowing oxygen to flow naturally. The patient uses a small handheld remote to turn Inspire on before bed and off when they wake up.

The safety and efficacy of Inspire was evaluated during the STAR clinical trial. Five-year STAR trial outcomes show patients using Inspire experience significant reductions in sleep apnea events and significant improvements in quality-of-life measures. There have been over 150 peer-reviewed publications on Inspire. These publications show results consistent with those seen in the STAR trial.

To learn more about Inspire, visit InspireSleep.com or www.fatimahospital.com ❖

Normal Pressure Hydrocephalus Multidisciplinary Center opens at RIH APC

PROVIDENCE – The Norman Prince Neurosciences Institute has opened the Normal Pressure Hydrocephalus (NPH) Multidisciplinary Center at the Rhode Island Hospital Ambulatory Patient Center (APC).

"Symptoms of NPH are complex and can be like other memory and movement disorders. Our team will evaluate patients in a comprehensive one-day visit to our center and provide a diagnosis and discuss treatment options," said **PETRA KLINGE, MD, PhD**, director, CSF Disorders of the Brain and Spine, Rhode Island Hospital.

Symptoms of NPH may include memory and cognitive impairment, problems with walking or a sensation that one's feet feel "stuck," and impaired bladder control. Because NPH is a chronic condition, its symptoms can develop slowly over months to years. The cause of NPH is currently unknown.

For more information, visit
https://www.lifespan.org/locations/normal-pressure-hydrocephalus-multidisciplinary-clinic ❖

Appointments

Dr. James V. McDonald nominated to serve as Commissioner of NY Dept. of Health

NEW YORK, NY – On March 24, NY Governor **KATHY HOCHUL** announced the nomination of **JAMES V. McDONALD MD, MPH**, to serve as Commissioner of the New York State Department of Health. He has served as New York's Acting Commissioner of Health since January 1.

"In the midst of unprecedented public health crises, the New York State Department of Health has done extraordinary work keeping New Yorkers safe and healthy," Governor Hochul said. "Dr. James V. McDonald is a talented public health leader with the skills and experience necessary to lead our Department of Health. I am proud to nominate him to this critical role, and I look forward to working closely with him to protect the health of all New Yorkers."

"Serving as Commissioner of the New York State Department of Health is the honor of a lifetime," Dr. McDonald said "I am deeply grateful to Governor Hochul for her confidence in me, and I look forward to working closely with my Department of Health colleagues to continue to deliver for New Yorkers."

Dr. McDonald is a native New Yorker who is originally from Cohoes and received his bachelor's degree from Siena College. He joined the New York State Department of Health in July of 2022, serving as medical director of the Department's Office of Public Health. He later was appointed Interim Director of the Center for Community Health and began serving as Acting Commissioner of Health on January 1 of this year.

Before returning to New York, Dr. McDonald spent a decade at the Rhode Island Department of Health where he served in multiple roles including Interim Director of Health, Chief Administrative Officer of the Board of Medical Licensure and Discipline, Medical Director for the COVID unit, as well as the Medical Director for Center for Customer Services and the Drug Overdose prevention program. He was also a member of the Governor's task force on Preventing Overdose deaths. Dr. McDonald has faculty appointments at the Brown School of Public Health as well as the Warren Alpert Medical School of Brown University. ❖

Kevin K. Martins, EdD, named Chief Diversity Officer of CNE

WARWICK – **KEVIN K. MARTINS, EdD**, has been named Chief Diversity Officer of Care New England Health System, effective April 10, 2023.

Dr. Martins is a strategic senior leader with over fifteen years of progressive experience in higher education, including Student Affairs and Diversity, Equity, and Inclusion, who will lead Care New England's commitment to establishing an environment that puts diversity, equity, and inclusion at the center of its work.

Associate Vice President for Diversity, Equity, and Inclusion at Bryant University, for the last several years, Dr. Martins provided strategic direction for training initiatives to increase awareness and support of equity and inclusion and increase belonging among all campus community members. During his time at Bryant University, he also served as Chair of the President's Council for Inclusive Excellence.

From 2019 to 2020, he served as Special Assistant to the President for Inclusive Excellence, and Director, at the PwC Center for Diversity & Inclusion, where he was the interim Chief Diversity Officer for the University.

Of his many accomplishments at Bryant, he established the Day of Understanding, a day of engagement centered on DEI, with over 6,000 participants attending over the course of three years. He also developed a new employee DEI training program for all new hires at the University and was recognized by the City of Providence with a Citizen Citation for collaborative community work.

Prior to his time with Bryant, Dr. Martins was the Student Conduct Coordinator for the Housing and Residential Life and Dean of the Student's Office at the University of Rhode Island, where he investigated all incidents of bias including but not limited to race, sex, religion, age, color, creed, national origin, disability, sexual orientation, gender identity or expression, or veteran status. He also served as a student conduct hearing officer in a system evaluating more than 2000 cases per year.

Dr. Martins currently serves on several non-profit boards including Diversity and Inclusion Professionals, 617Peak, and The YMCA of Pawtucket, and is a Pawtucket Mayor's Community Board member.

He earned his Bachelor of Science in Business Administration degree from the University of Rhode Island. He later earned his Master of Business Administration from the University of Rhode Island and his Doctor of Education in Educational Leadership from Johnson & Wales University. ❖

Obituaries

STEPHEN D. DiZIO, MD, 72, of Barrington, died unexpectedly on March 19, 2023 in Melbourne, Australia. He was the beloved husband of Carol Ann (Zimmerman) DiZio.

Born in Newark, NJ, he lived in Barrington for 43 years, previously residing in Bristol.

Dr. DiZio was the Medical Director and a Psychiatry Specialist for the Community Care Alliance of Rhode Island, Woonsocket for 38 years before retiring in 2022. He previously had a private practice in Providence.

He was a graduate of Newark College of Engineering Class of 1972 and a graduate of the University of Medicine and Dentistry of New Jersey Class of 1976.

Dr. DiZio was a communicant of St. Luke Church. He was a member of the American Psychiatric Association and American Medical Association.

He enjoyed playing music, especially at Open Mic events. He was a member of the former Exit 131 band.

Besides his wife of forty-nine years, he is survived by three sons, Christopher DiZio of Providence, Michael DiZio of Pawtucket, and Joey DiZio of Quincy, MA, and two sisters, Patricia DiZio of Breese, IL and Christine Jadczak of Lancaster, KY.

Contributions in Dr. DiZio's memory to the Community Care Alliance, P.O Box 1700 Woonsocket, RI 02895 for a memorial tree and plaque would be deeply appreciated. Any remaining funds would go directly to Community Care Alliance. ❖