ATS 2024

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Congress Review

Review of the American Thoracic Society (ATS) International Congress 2024

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THIS year, the 2024 International Conference of the American Thoracic Society (ATS) took place in San Diego, California, USA, from May 17th–22nd. The opening ceremony began with a powerful sentiment from Maria Patricia Rivera, ATS President, spotlighting the ATS research program, which celebrates its 20th anniversary.

This initiative was launched in 2004, and since then, has successfully raised and granted approximately 24,000,000 USD in research funding to 302 investigators around the world. As stated by Rivera, these investigators have gone on to garner over 880 million USD in National Institutes of Health (NIH) funding, accelerating the research careers of many of those starting out. Projects encompassed the fields of asthma, chronic obstructive lung disease, lung cancer, epigenetics, interstitial lung disease, lung transplantation, sleep-disordered breathing, and more. The quantity and versatility of research funded is truly staggering!

> **These investigators have gone on to garner over 880 million USD in NIH funding**

Rivera subsequently welcomed all leaders of fellow international respiratory societies and past ATS presidents, board members, and committee and assembly leaders. She drew attention to the 30th anniversary of the Methods in Epidemiologic, Clinical, and Operations Research (MECOR) Program, and the 120-year anniversary of the American Lung Association (ALA). The 2023–2024 ATS Strategic Goals were shared: to lead scientific discoveries, advance professional development, transform patient care, impact global health, and strengthen the ATS community.

The 2024 Respiratory Awards included the ATS Public Service Award to Rajkumar Savai, Justus Liebig University Giessen, Germany; the ATS World Lung Health Award to Sundeep Salvi, Chest Research Foundation, Pune, India; and the Jo Rae Wright Award for Outstanding Science to Georgios Kitsios, University of Pittsburgh, Pennsylvania, USA. Furthermore, Thanh Neville, University of California, Los Angeles, USA, was awarded the J. Randall Curtis Humanism Award. All of these awards recognized the exceptional work done in the field, and the continued commitment to innovation and improved patient care.

20

year anniversary of the ATS research program

30

year anniversary of the Methods in Epidemiologic, Clinical, and Operations Research Program

120

year anniversary of the American Lung Association

Finally, William Flanary, famously known as satirist 'Dr Glaucomflecken', took the stage, sharing a particularly moving story about his experience with testicular cancer. He had also suffered a cardiac arrest, for which his wife had to perform cardiopulmonary resuscitation. From this story, he emphasised the need for greater compassion for the partners and responders on patients, termed 'forgotten patients' by Flanary. He drew the audience's attention to the emotional distress of these medical events, and the aftershock that follows.

> **He emphasized the need for greater compassion for the partners and responders on patients termed, 'forgotten patients'**

Stay tuned for more insights of the ATS Congress, and come back next year for our coverage of the 2025 ATS Congress, taking place in San Francisco, California from May 16th–21st.

Switching to E-Cigarettes Post-Smoking Cessation Increases Lung Cancer Risk

RESEARCH presented at ATS 2024 found that former cigarette smokers that switched to electronic cigarettes (e-cigarettes) faced higher cancer risks and mortality rates, particularly among high-risk individuals.

High-risk ex-smokers who had quit for <5 years and used e-cigarettes showed a **higher risk** of lung cancer
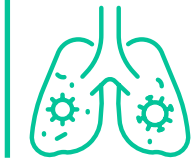
E-cigarettes have gained popularity in the recent years, particularly in conventional cigarette smokers as an alternative to conventional cigarettes. The research study led by Yeon Wook Kim from the Division of Pulmonary and Critical Care Medicine at Seoul National University, Repulic of South Korea, revealed that switching to e-cigarettes after quitting conventional smoking does not eliminate the risk of lung cancer but, in fact, increases it. The nationwide population-based study followed over 4.3 million individuals with a history of smoking who participated in the National Health Screening Program for two periods: 2012–2014 and 2018. The study aimed to assess lung cancer risk and lung-cancer specific death (LCSD) associated with smoking habit changes from e-cigarette use among conventional cigarette smokers, stratified by the length of smoking cessation.

Results showed that ex-smokers who had quit for ≥5 years and used e-cigarettes had a significantly higher risk of LCSD (adjusted hazard ratio [aHR]: 2.69; 95% CI: 1.12–6.46) compared to those who did not use e-cigarettes. Ex-smokers who had quit for 5 years and used e-cigarettes showed a higher risk of lung cancer development (aHR: 1.23; 95% CI: 1.09–1.39) and LCSD (aHR: 1.71; 95% CI: 1.10–2.66) than those who did not use e-cigarettes. Additionally, high-risk individuals (aged 50–80 years with ≥20 pack-years of smoking history) who had quit for ≥5 years and used e-cigarettes reported higher risks of lung cancer (aHR: 1.65; 95% CI: 1.05–2.58) and LCSD (aHR: 4.46; 95% CI: 1.85–10.75) compared to those who did not use e-cigarettes. Similarly, high-risk ex-smokers who had quit for <5 years and used e-cigarettes showed a higher risk of lung cancer (aHR: 1.26; 95% CI: 1.03–1.54) compared to those who did not use e-cigarettes.

The results showed that switching to e-cigarette use after conventional smoking cessation was associated with higher risk of developing lung cancer and higher mortality. This emphasizes the need for clinicians to caution patients about risks associated with conventional smoking alternatives and explore different strategies.

Extreme Heat Increases Risk of Asthma Hospitalizations in Children

RESEARCH presented at ATS 2024 presented by Morgan Ye, Department of Medicine and Epidemiology and Biostatistics, University of California San Francisco, USA, revealed significant links between extreme heat events and asthma exacerbations in pediatric patients.

Increased odds of asthma related hospital visits by

83%
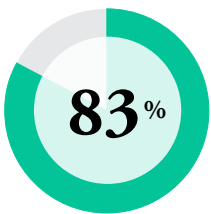
during extreme heat events

The study, conducted at the University of California San Francisco Benioff's Children Hospital, Oakland, USA, has found a significant association between extreme heat events and increased hospitalization and emergency department visits related to asthma among children. The study focused on a pediatric population served by a Federally Qualified Health Center in California.

Researchers analyzed electronic health record data from 2017–2020, which covered asthma related hospital visits and demographic data, including the patients' zip codes. Temperature data were obtained from the PRISM Climate Group of Oregon State University, which provided daily maximum and minimum temperatures for each zip code's population-weighted centroid. The study focused on the warm season (June–September) and evaluated 18 different heat wave definitions, including temperatures exceeding the 99th, 97.5th, and 95th percentiles of the total distribution of the study period for 1, 2, or 3 days. Time-stratified case-crossover design and conditional logistic regression models were used to assess the association between heat waves and asthma hospital visits. The analysis was further stratified by geographic regions within Central California and the Bay Area.

Results showed that daytime heat waves were significantly associated with increased odds of asthma hospital visits. More specifically, 1-day heat waves at the 95th percentile of temperature increased the odds of asthma hospital visits by 21%, and 3-day heat waves at the 99th percentile showed a nearly 80% increase in the odds of hospital visits. Data stratified by region showed a strong association in the Bay Area, with 83% increased odds of asthma related hospital visits during extreme heat events.

> **Results showed that daytime heat waves were significantly associated with increased odds of asthma hospital visits**

This study highlights the impact of extreme heat events on asthma exacerbations among children, particularly in the Bay Area. The study's findings underscore the need for implementing more targeted public health interventions to protect vulnerable pediatric populations during heatwaves. These measures could include increasing awareness about the associated health risks and enhancing asthma management plans during periods of extreme heat.

Suboptimal Adoption of Updated Guidelines in Asthma Management

A RECENT study presented at the ATS 2024 International Conference revealed that only 14.5% of adult patients with asthma receive the recommended Single Maintenance And Relief Therapy (SMART) combination inhaler regimen, despite its endorsement in updated guidelines.

The National Asthma Education and Prevention Program and the Global Initiative for Asthma updated their guidelines in 2021, advocating for the use of a single inhaler containing both an inhaled corticosteroid (ICS) and formoterol, a long-acting beta-agonist (LABA). SMART has been proven to significantly reduce asthma exacerbations in patients with moderate and severe asthma. Before the development of SMART, asthma management relied on using separate maintenance and rescue inhalers. However, researchers from Yale University School of Medicine noted that there has been limited data describing changes in SMART uptake and prescription since the update in management guidelines.

Researchers examined trends in SMART prescription for patients diagnosed with asthma, prescribed a maintenance inhaler containing ICS-LABA or ICS alone, and who had at least one visit to a pulmonary or allergy clinic between January 2021–August 2023. The study analysis comprised 2,016 patients from an academic healthcare system and excluded any patients with alternative pulmonary diagnoses. Statistical analyses were employed to evaluate the relationship between patient characteristics and prescription of SMART.

It was found that 87% of patients who were prescribed SMART were also given a rescue inhaler, despite SMART inhalers being suitable for rescue use. Results revealed that patients prescribed ICS-formoterol as a maintenance inhaler were more likely to be prescribed SMART. Moreover, patients older and receiving Medicare insurance were less likely to be prescribed SMART. Researchers hypothesized that medical providers are less inclined to modify treatment regimens for older patients who are typically more resistant to changes and have been using the same inhalers for many years.

The study highlighted the need for further efforts to address barriers to SMART adoption, including insurance coverage issues, patient education, and clinician support. The results echoed findings from past studies demonstrating that clinicians can take over 15 years to widely adopt guideline updates. "This discordance between guidelines and practice is important to recognize and remedy as SMART can improve asthma outcomes," the authors concluded.

New Clinical Tool to Prioritize High-Risk Infants for Respiratory Syncytial Virus Immunization

AT THE ATS 2024 International Conference, researchers introduced a clinical prediction tool designed to prioritize high-risk infants for respiratory syncytial virus (RSV) immunization, particularly in light of the limited availability of nirsevimab in the USA.

Brittney M. Snyder, the lead author from Vanderbilt University Medical Center, Nashville, Tennessee, USA, emphasized the importance of timely identification of infants at the highest risk for RSV-related morbidity to optimize prevention efforts. This personalized risk prediction tool aims to effectively allocate limited immunoprophylaxis resources, such as nirsevimab and palivizumab, to achieve maximum benefit and promote RSV prevention among high-risk infants' families.

The study included 429,365 infants insured by the Tennessee Medicaid Program, out of which 713 developed severe RSV lower respiratory tract infections (LRTI) requiring intensive care unit (ICU) admission. Researchers, including biostatistician Tebeb Gebretsadik, developed a multivariable logistic regression model using 19 demographic and clinical variables collected at or shortly after birth. These variables included prenatal smoking, delivery method, maternal age, and assisted breathing during birth hospitalization. The model demonstrated good predictive accuracy and internal validation.

The necessity of this tool became apparent during the nirsevimab shortage in October 2023, when the CDC recommended prioritizing high-risk infants who were not eligible for palivizumab. Nirsevimab, a long-acting monoclonal antibody, and palivizumab, a short-acting monoclonal antibody requiring monthly injections, are both used to prevent RSV LRTI in newborns and young children.

Tina V. Hartert, the principal investigator, highlighted the tool's potential to prioritize

RSV prevention products effectively and to persuade vaccine-hesitant families by demonstrating their newborn's high risk for severe RSV infection. Co-author Niek Achten suggested the tool could be valuable in countries with budgetary constraints, ensuring the highest-risk infants receive necessary immunizations.

> "This tool represents a significant advancement in the strategic allocation of RSV prevention"

Next steps for the tool include external validation, further cost-effectiveness analyses, and decision curve analyses to ensure its optimal usefulness in preventing severe RSV LRTI among infants during periods of limited immunization availability. This tool represents a significant advancement in the strategic allocation of RSV prevention resources, potentially improving outcomes for high-risk infants.

Increased Hospital Diversity Linked to Higher Ventilation Mortality Rates

NOVEL findings presented at ATS 2024 have shown that mortality rates for patients receiving mechanical ventilation for pneumonia or sepsis increase with the diversity of hospital patient populations.

This trend indicates that systemic factors, such as resource allocation and income levels, may significantly influence patient outcomes. Historically, health disparities research has focused on individual patient factors like race and income, with less attention given to the hospital systems where these disparities occur. Previous research indicated that Black women receiving mechanical ventilation for pneumonia or sepsis face the highest risk-adjusted mortality rates, while White men have the lowest.

To understand and address the systemic issues, the team conducted a study using data from the Healthcare Cost and Utilization Project State Inpatient Databases from 2018–2019. This dataset included non-surgical patients with pneumonia or sepsis from 1,045 hospitals, encompassing over 16 million hospitalizations. After excluding hospitals with fewer than 25 patients of color, the researchers categorized hospitals into quartiles based on racial diversity and analyzed outcomes for 161,560 eligible patients.

The study found that Black women had a 37.6 percent mortality rate, compared to 36 percent for White men. While the adjusted odds of death for Black women versus White men did not significantly vary between hospital diversity quartiles, overall mortality rates were higher in more racially diverse hospitals. The researchers noted that this increased strain might result from factors like hospital resources, staffing, insurance types, and neighborhood income levels.

The study supports previous research on hospital racial diversity and its impact on mortality following heart attacks and ICU outcomes. Gwenyth Day, University of Colorado Anschutz Medical Campus, Aurora, USA, stressed the importance of examining systemic contributors to adverse patient outcomes. "This data highlights the need for a careful evaluation of factors contributing to these outcomes and suggests adjusting resource allocation to reduce inequity and improve patient care," Day stated. Future research by Day and colleagues will focus on understanding the variability in mortality rates from mechanical ventilation across different hospitals, aiming to identify the root causes of these disparities. They plan to use qualitative and survey methodologies to explore patient and provider experiences of bias, discrimination, and practice variability. This mixed-methods approach will hopefully help dissect the observed differences in outcomes and contribute to strategies for reducing health disparities in hospital settings.

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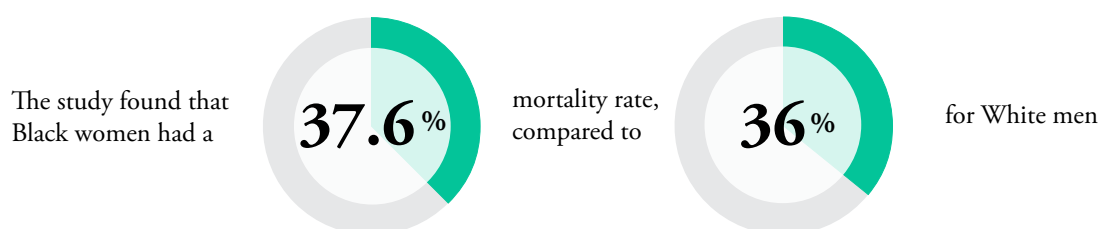
Hormone Replacement Therapy May Improve Pulmonary Hypertension

BREAKING research presented at ATS 2024 investigates the impact of hormone replacement therapy (HRT) on pulmonary hypertension (PH) in women, a disease affecting blood vessels between the heart and lungs.

Specifically, it explores whether endogenous and exogenous HRT influence right ventricular function and PH severity across different classifications of the disease.

> **Longer duration of menses and HRT use were associated with lower mean pulmonary artery pressure**

Researchers enrolled with G1, G2, G3, G4, or G5 PH (classified by the World Symposium on Pulmonary Hypertension [WSPH]), or mixed diseases, were categorized by their predominant subclass. Overall, 742 women with G1–G5 PH, and healthy controls were included. The research team quantified endogenous hormone exposure by assessing the duration of self-reported lifetime duration of menses and exogenous exposure by HRT usage. Right ventricular function was assessed using echocardiography, and pulmonary vascular disease was measured by mean pulmonary artery pressure during right heart catheterization. Two statistical analyses were conducted to evaluate differences in pulmonary vascular disease and right ventricular function.

Results indicted that a longer duration of menses and HRT use were associated with lower mean pulmonary artery pressure and improved right ventricular function across all PH groups. Use of HRT was associated with a lower mean pulmonary artery pressure and higher right ventricular ejection fraction. In the G1 PH group, HRT exposure correlated with lower pulmonary artery pressure and pulmonary vascular resistance, and higher right ventricular ejection fraction. However, no significant differences were observed in WSPH Groups 2–5.

The findings suggest that hormone exposure, particularly HRT, may have a beneficial effect on pulmonary vascular disease and right ventricular function in women with PH. The results indicate a potential synergistic effect of age and HRT, supporting the theory that a threshold of estrogen exposure is necessary for a protective effect. Further research is encouraged to explore the mechanisms of female reproductive hormones as therapeutic targets for PH.

 AMJ

Improving Patient Outcomes for Veterans After Critical Illness

VETERANS who received care via the Post-acute Recovery Center (PARC) model after critical illness experienced better patient outcomes, with fewer deaths and more days spent at home, according to research presented at the ATS 2024 International Conference.

There was a

16.1%
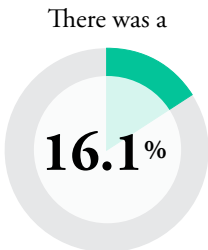
absolute reduction in mortality risk in the PARC group

Each year, over 100,000 veterans who survived critical illnesses, such as sepsis and acute organ failure, transition from intensive care units to their homes whilst classed as high-risk with ongoing acute medical issues. PARC is a telehealth care model led by nurse practitioners that aims to improve patient-centred outcomes for veterans transitioning from intensive care units to home.

Hiam Naiditch, a pulmonary and critical care fellow at the University of Pittsburgh Medical Center, Pennsylvania, USA, and colleagues conducted a retrospective analysis of 32,060 veterans from the Department of Veterans Affairs Pittsburgh Healthcare System who were classified as at risk of 1-year mortality based on their PREDICT score (a validated risk assessment tool). To assess the impact of PARC, the research team calculated the number of hospital-free days during the first 90 days after discharge. The research team discovered that high-risk veterans who received PARC care had a median of four more days at home compared to matched controls. Furthermore, there was a 16.1% absolute reduction in mortality risk in the PARC group.

The researchers concluded that PARC is a viable post-acute care model that has the potential to improve care and reduce mortality risk in high-risk veterans after critical illness. Furthermore, this study highlights the importance of utilising models to improve patient-centred outcomes for high-risk survivors of critical illness in the broader population. The next step for Naiditch and colleagues is to conduct a randomised trial across several veteran facilities in the northeastern USA to validate the results seen so far with PARC care, and to provide further information on its effectiveness and scalability.

Insufficient Home Health Nursing for Children Who Require Ventilation

FAMILIES with children who require tracheostomy and mechanical ventilation often have to make significant employment changes due to a lack of home health nurses in their area.

Research led by Brian Jordan, Director of advanced mechanical ventilation and Associate Professor of Pediatrics, Division of Neonatology, Oregon Health & Science University, Portland, USA, explored the medical, social, and financial costs caused by a lack of home health nursing for children who are supported by tracheostomy and mechanical ventilation.

Jordan and colleagues conducted the first study to focus on in-home nursing from the perspective of the families with medically-complex children who require tracheostomy and mechanical ventilation. Between May–July 2023, 242 families in 34 states and the District of Columbia answered survey questions regarding home health nursing. It was reported that 86.8% of families had home health nursing hours approved by their insurers. However, 47.5% indicated that less than half of the approved hours were covered. Furthermore, 28.3% mentioned that no in-home nursing was available at the time of hospital discharge and 37.9% noted that their child's discharge was delayed due to the lack of in-home nursing care in their area.

The results also indicated that 87.8% of families had to make considerable employment adjustments because of insufficient in-home nursing. These employment changes were not equally distributed between parents, impacting 78.4% of mothers surveyed. A total of 31.8% of families reported an annual household income reduction between 50,000 and 100,000 USD.

> **The medical, social, and financial costs caused by a lack of home health nursing**

These findings emphasize the impact of a lack of accessible and sufficient home health nursing on families, including delays in hospital discharge, the need for major career changes, and significant income loss. Improvements in at-home care will reduce the burden on families and enhance the care for children with various pulmonary conditions that require tracheostomy and mechanical ventilation. A possible solution would be to implement more supportive legislation and services that assist families of children who require complex care.

AMJ

Impact of Race-Neutral Equations on COPD Trial Eligibility

AT THE ATS 2024 International Conference, research revealed that using race-neutral spirometry reference equations for determining eligibility for chronic obstructive pulmonary disease (COPD) clinical trials may increase the enrolment of Black patients.

This study addresses a gap in understanding the impact of these equations on clinical trial inclusion criteria. Frank Sciurba from the University of Pittsburgh, Pennsylvania, USA, led the investigation, highlighting the shift from racially adjusted spirometry interpretations, which traditionally required lower values for Black patients.

> **These new guidelines suggest a more uniform approach, potentially altering the severity levels and eligibility for COPD clinical trials**

In 2023, the ATS recommended discontinuing the use of race and ethnicity in spirometry interpretations, endorsing the Global Lung Function Initiative (GLI) race-neutral equations instead. These new guidelines suggest a more uniform approach, potentially altering the severity levels and eligibility for COPD clinical trials.

The study analysed spirometry data from the Combined Pittsburgh Lung Cohort, including 3,716 participants (3,474 White and 242 Black). The researchers compared the results using GLI ethnic-adjusted and GLI global race-neutral equations to determine the percent of forced expiratory volume in 1 second and GOLD stage for each individual. They found that using race-neutral equations resulted in a significant shift: 5.8% of individuals became ineligible, while 2.1% gained eligibility. Specifically, 1.6% of White and 8.3% of Black patients gained eligibility, while 6% of White and 2.9% of Black patients lost eligibility.

The findings suggest that race-neutral spirometry equations could reduce the severity classification for White subjects while increasing it for Black subjects, thereby impacting clinical trial enrolment criteria. The research team anticipates that these results will prompt further discussion and investigation into developing appropriate inclusion criteria, potentially enhancing the diversity and fairness of COPD clinical trials. Future research will explore the implications of these shifts and evaluate the role of race-independent classification in clinical trial selection.