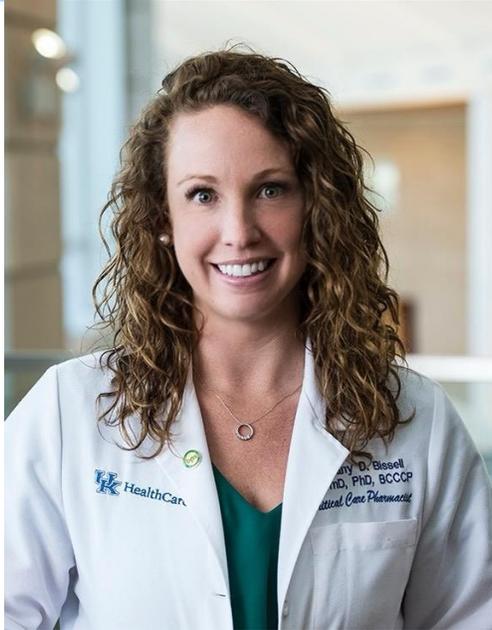


# ATS Highlights 2022: Critical Care Assembly Early Career Professionals



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## *Tell us about your research.*

My research interests include de-resuscitation/fluid stewardship as well as immunomodulatory properties of intensive care unit pharmacotherapeutics. I am an assistant professor within our college of pharmacy where I lecture on critical care pharmacotherapy. I am assistant program director of our critical care pharmacy residency and I chair the Anti-Harassment, Civility, Inclusion, and Diversity committee within our residency committee.

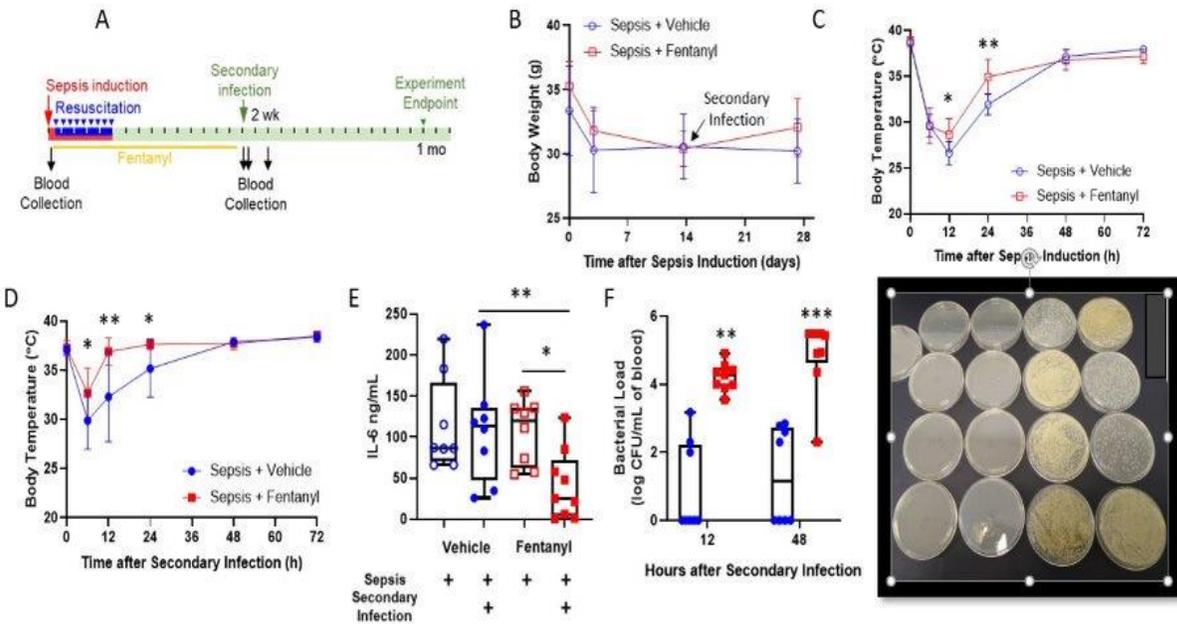
## *Where do you see yourself in 5 years?*

This has changed a lot for me in the last 18 months. The COVID-19 pandemic has really encouraged me to evaluate my future goals and how they align with who I want to be as a person and what I want to give back to society. Whether it is continuing to pursue a career in research or administration, I hope I am pushing to make the world a better place and helping the lives of the patients I take care of.

## *What are your passions in life?*

Inside and outside of work, I'm passionate about being an advocate for equity in healthcare and healthcare training. I recently became a Trevor Project counselor, which is work I find very rewarding. I also volunteer at our local Refuge Clinic after hours, a project that I am super passionate about. In my free time, I love gardening and riding my Peloton (shoutout to #PelotonMedTwitter 🙌)

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**Figure 1.** Plasma IL-6 levels are reduced and bacterial load is greater following a secondary infection in post-sepsis mice treated with fentanyl.

## Purpose

Opioid analgesia remains a standard of care supportive therapy in those patients admitted to the intensive care unit (ICU) with sepsis. We investigated whether opioid exposure increases secondary infection burden and immunosuppression in sepsis populations.

## Methods

We performed a three-phase study evaluating the use of opioids compared to non-opioid analgesia in sepsis. In phases I-II, a murine model was utilized evaluating fentanyl versus control as supportive care. Mice were then re-infected to determine immune response to secondary infectious insult. In phase III, a post-hoc analysis of cytokines was performed in a human sepsis population of a previous randomized controlled trial.

## Results

Concomitant fentanyl during sepsis in murine models was associated with a blunted cytokine response, specifically IL-6 ( $p=0.005$ ) and a significantly higher bacterial burden ( $p=0.01$  at 12 and 48 hours) with minimal impact on overall cell counts. In a human population, IL-23 was significantly decreased in patients with fentanyl exposure. IL-23 also noted to be significantly lower in non-survivors ( $p<0.001$ ).

## Conclusion

Opioid exposure in pre- and post-clinical sepsis models is associated with ineffective bacterial clearance and alterations in cytokine profiles. Further human studies are warranted to evaluate this complex interaction and its clinical implications.