

# Microbiome in Critical Illness

**Microbiome in Sepsis and COVID-19**, *F. Forfori, S. Ferrari, A. Isirdi, F. Corradi*

**The Intestinal Microbiome in Critical Illness**, *N.J. Klingensmith, C.M. Coopersmith*

**Microbiome and Pneumonia in Children**, *C. Guitart, I. Jordan, E. Esteban*

**Microbiome and Probiotics: Do They Really Work?** *Y. Longhitano, C. Zanza, T. Romenskaya et al.*

**Clostridioides difficile Infection: A Serious Complication of Intestinal Microbiome Alteration**

**in Critical Patients**, *M.G. Olvera-Ramos, G. Castillo-Gutiérrez, G.A. Bautista-Aguilar et al.*

**The Role of the Microbiome and Nutritional Therapy in Critical COVID-19**, *V.A. Bolaños-Toscano, S.E. Martínez-Vázquez, A. Kammar-García et al.*

**Safer Intubation Practices in Critically Ill Patients – What We Learned During the COVID-19 Pandemic That Should Not Be Forgotten**, *P.V. Mendes, B.A. Besen, L. de Azevedo*

**Methylene Blue for Vasoplegic Syndrome Post Cardiac Surgery**, *B. Gladwin, P. Young*



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**M**ultiple factors can bring the microbiome out of balance in critically ill patients in the intensive care unit. These include antibiotic use, mechanical ventilation, changes in diet and inflammatory responses. The dysbiosis of the microbiome can alter immunological responses and could potentially have an impact on patient outcomes.

There are approximately [100 billion microorganisms](#) in our body. The microbiome has a diverse role to play in the overall maintenance of human health and wellness. However, very little attention is paid to this microbial community. It is important to study and interpret the microbiome in critically ill patients as this can provide significant insight on how it can be manipulated to improve clinical outcomes.

The goal of addressing the microbiome in critically ill patients is to ensure that it does not transform from a health-inducing entity into a disease-promoting agent. Once we recognise the fact that the composition of the microbiome in critically ill patients evolves rapidly and can become significantly altered with the severity of illness, we will understand the importance of ensuring this does not happen. Multiple factors are at play, and that is why there is a need to apply effective therapeutic strategies for manipulating the microbiome in critical illness.

In this issue, our contributors discuss **Microbiome in Critical Illness**. Francesca Forfori and co-authors explore the many roles of gut microbiota and highlight the importance of targeting therapeutical interventions to restore, preserve and enrich its composition. Nathan Klingensmith and Craig Coopersmith discuss how critical illness alters the intestinal microbiome and how manipulating it could offer a potential treatment approach in ICU patients.

Carmina Guitart and co-authors point out the research gap that exists in the field of the lung microbiome and pneumonia development in the paediatric population and discuss how its study could improve nosocomial pneumonia prevention. Yaroslava Longhitano and co-authors explore the microbiome and probiotics and whether they really work and highlight how the microbiota can play a crucial role in preventing ICU associated complications.

María Guadalupe Olvera-Ramos and co-authors talk about *Clostridioides difficile* infection and how it presents a potentially serious complication in critically ill patients in the ICU, and how it must be identified and diagnosed in time to start early management and treatment. Victor Andrés Bolaños-Toscano and co-authors talk about the role of the microbiome and nutritional therapy in critically ill patients with COVID-19 and how it could be important for the prevention and management of critical disease.

In our Matrix section, Pedro Vitale Mendes and co-authors provide an overview of the available evidence on safe intubation practices in critically ill patients in light of new evidence seen during the COVID-19 pandemic. Benjamin Gladwin and Paul Young discuss methylene blue and highlight the need for more evidence to determine whether it could be a useful treatment for patients with vasopressor-refractory vasoplegia.

As always, if you would like to get in touch, please email [JLVincent@icu-management.org](mailto:JLVincent@icu-management.org).

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