



Audit & Feedback

MetaLab

International Audit & Feedback MetaLab Meeting:  
Putting A&F into real world practice

# PREVENTION OF CATHETER-RELATED INFECTIONS IN INTENSIVE CARE UNITS

**Michela Fantini**

Health Services Research and Evaluation Unit, Local Health Authority of Romagna

**D / EP / Lazio**  
Department of Epidemiology  
Lazio Regional Health Service, Italy



SISTEMA SANITARIO REGIONALE

ASL  
ROMA 1



REGIONE  
LAZIO



UNIVERSITÀ  
CATTOLICA  
del Sacro Cuore



The Ottawa  
Hospital  
Research Institute

L'Hôpital  
d'Ottawa  
Institut de recherche

# INTRODUCTION

Central venous catheters (CVC) are essential for the treatment of hospitalized patients, particularly in intensive care units (ICU). Infections are among the most significant complications associated with vascular catheter use.

Central line-associated bloodstream infections (CLABSI) rank as the fourth most common cause of nosocomial infections in medical and surgical ICUs where most complicated patients are managed .

DEFINITION of CLABSI: Bacteremia in a patient with a CVC for at least 48 hours, where the positivity of blood cultures drawn from the CVC precedes by at least 2 hours the positivity of blood cultures drawn from a peripheral vein.

# BACKGROUND

CLABSI is associated with significant morbidity, prolonged hospitalization, and increased costs, with a mortality rate of 12-25% (Olaechea et al., 2013; Riu et al., 2012)

In recent decades, significant reductions in CLABSI have been observed in the U.S.A due to extensive implementation of prevention programs, such as a decline from 3.64 to 1.65 infections per 1,000 CVC days from 2001 to 2009 in ICUs. (Centers for Disease Control and Prevention [CDC], 2011)

In 2022 also Romagna Local Health Authority also began working on CLABSI prevention in its ICUs.

# CONTEXT



Area: 5,098 km<sup>2</sup>

Population: 1,125,000 inhabitants

Provinces: 3 (Ravenna, Forlì-Cesena, and Rimini)

Hospitals: 13

ICU: 7



**SPIAR**  
Sicurezza nella cura

In 2014, a multidisciplinary “Program for managing infection risk and responsible antibiotic use” called SPIAR was implemented

# AIM OF THE PROJECT

Prevent and reduce complications related to venous access to improve the safety of hospitalized patients with CVCs in ICU.

# METHODS

- Define best practices for vascular access care in adult patients based on recent literature and guidelines.
- In deep examination, through direct observation, of actual health professional behavior in the management of CVC .
- Systematic provision of information to ICU health professionals with clinical and organizational responsibility
- Promote continuous education for involved staff.

# KEY COMPONENTS OF INTERVENTION

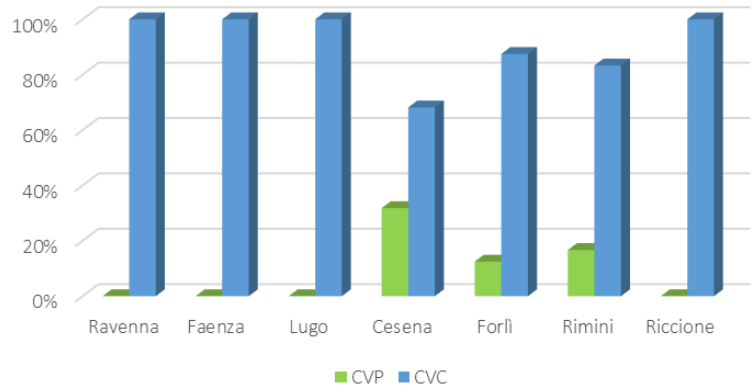
- Establishment of multidisciplinary group for development of recommendations

- Direct observation of CVC placement, management, and removal practices of the ICU staff

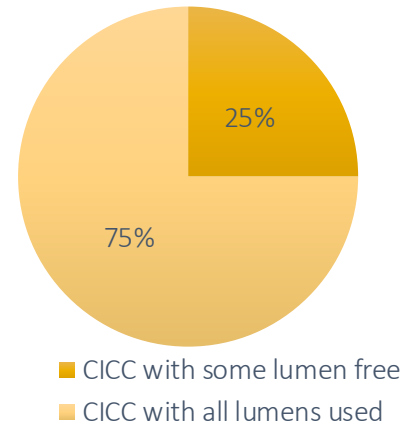
- Reporting of the result of the observations and feeding back key information through structured report

# EXAMPLE OF REPORT

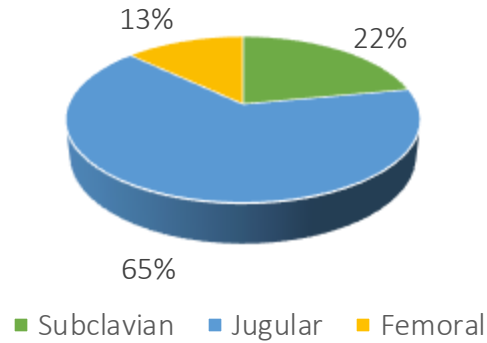
Kind of device used



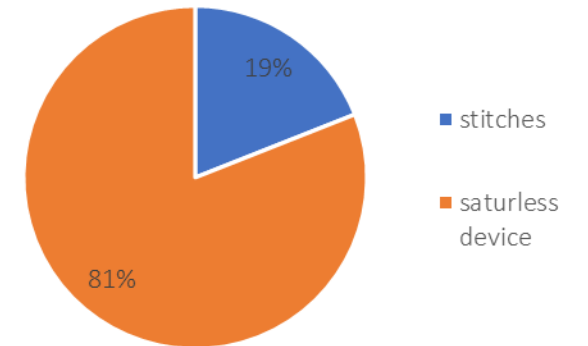
CVC/lumen ratio



Site of CVC insertion



Fixing of the CVC

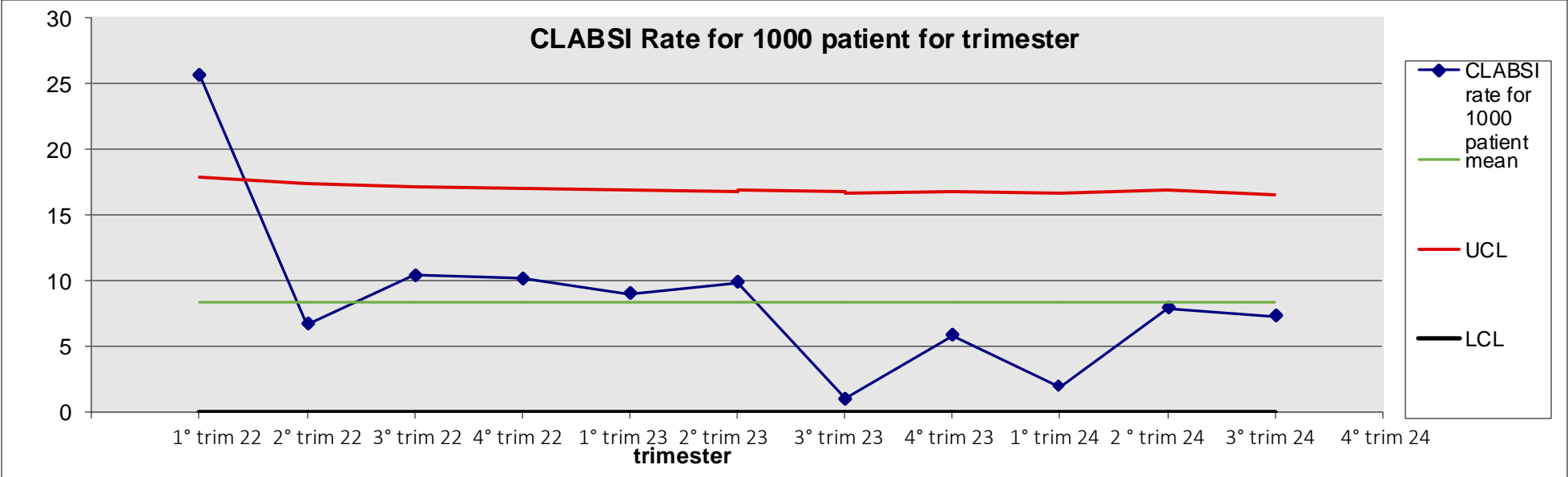


	2018			2019			2020			2021		
	N° Blood culture	N° CLABSI	CLABSI per 1000 patients	Blood culture	N° CLABSI	CLABSI per 1000 patients	Blood culture	N° CLABSI	CLABSI per 1000 patients	Blood culture	N° CLABSI	CLABSI per 1000 patients
ICU wards	607	31	8.1	616	39	9.3	980	53	14	957	60	16.4

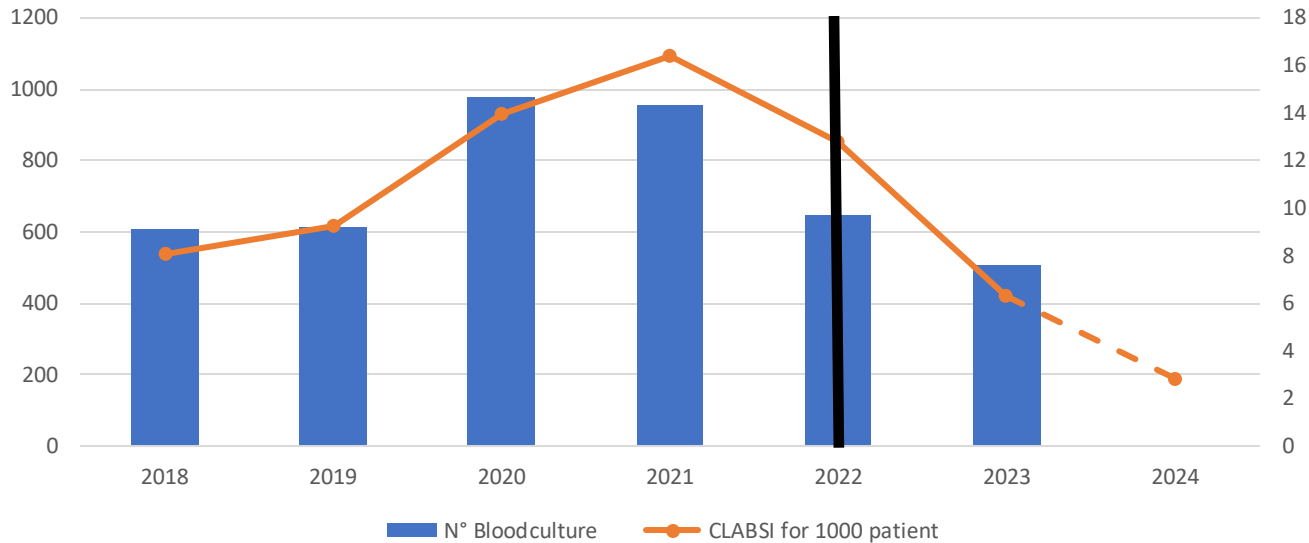


# OUTCOMES OF THE INTERVENTION

- 1. During 2023, distribution of training materials, bundles, and slides for the training of involved staff in each ICU, reaching more than 60% trained staff at the end of 2023.
- 2. September 2024, publication of the procedure "Prevention of infectious risk in the management of venous vascular accesses in adult and pediatric patients", with all recommendations on standardize supply materials, correct positioning and use of catheter.
- 3. Decline of CLABSI trend ?



# TREND OF CLABSI



Trend of the number of blood cultures performed for suspected central line-associated bloodstream infections (CLABSI) and the number of CLABSI episodes per 1,000 hospitalized patients from 2018 to 2023, with projections for 2024, in the seven Intensive Care Units involved in the project (the black arrow indicates the year of intervention)

Since 2022, the CLABSI rate per 1000 patient start a continuous decline.

Thanks to that the multidisciplinary approach, the continuous reporting and training stimulated changes in health professionals' behaviors.

# CONCLUSION

- CLABSIs represent fearsome healthcare-associated infections but preventable.
- Quarterly monitoring of suspected CLABSI is recommended to ensure timely intervention when necessary.
- For sure time elapsed since the intervention is too short to allow for a complete evaluation of its effectiveness, so we will repeat the analysis in the coming months, year.
- Our experience highlights the effectiveness of a multidisciplinary intervention in preventing CLABSI in ICUs and served as an example of how to design improvement initiatives to modify and standardize practices



Audit & Feedback

MetaLab

THANKS

[michela.fantini@auslromagna.it](mailto:michela.fantini@auslromagna.it)

D / EP / Lazio

Department of Epidemiology  
Lazio Regional Health Service, Italy



SISTEMA SANITARIO REGIONALE

ASL  
ROMA 1



REGIONE  
LAZIO



UNIVERSITÀ  
CATTOLICA  
del Sacro Cuore



The Ottawa  
Hospital  
Research Institute

L'Hôpital  
d'Ottawa  
Institut de recherche