

Ertapenem: Rationale for EUCAST Clinical Breakpoints

Current version	3.0	January 2024
Previous versions	2.0	January 2021

Introduction

Ertapenem is a carbapenem, available only for parenteral use.

Ertapenem is relevant for therapy of septicaemia, post-operative sepsis, nosocomial pneumonia, community acquired pneumonia, and complicated skin and soft tissue infections caused by *Staphylococcus* spp., *Streptococcus* spp. (including *Streptococcus pneumoniae*), *Haemophilus influenzae* and *Enterobacterales*. Ertapenem is not considered active against *Pseudomonas* spp, *Stenotrophomonas maltophilia*, *Acinetobacter* spp. and *Enterococcus* spp..

Resistance to ertapenem is conferred by PBP changes which mediate high-level penicillin resistance in *S. pneumoniae*, by PBP changes mediating β -lactam resistance in *H. influenzae*, and by production of carbapenemases in *Pseudomonas* spp. and *Enterobacterales*. Ertapenem is affected by some classical ESBL and AmpC beta-lactamases in *Enterobacterales* but organisms remain clinically susceptible. In *Enterobacterales* resistance may be conferred by combinations of an ESBL or AmpC enzyme and impermeability.

This version is extracted from version 2.0, and will be format for future updates. Previous versions are available on request.

Dosages related to clinical breakpoints

Standard dosage: 1 g x 1 iv over 30 minutes
High dosage: None

MIC distributions and epidemiological cut-off (ECOFF) values

MIC distributions and ECOFFs can be found at <https://mic.eucast.org/Eucast2/SearchController/search.jsp?action=init>

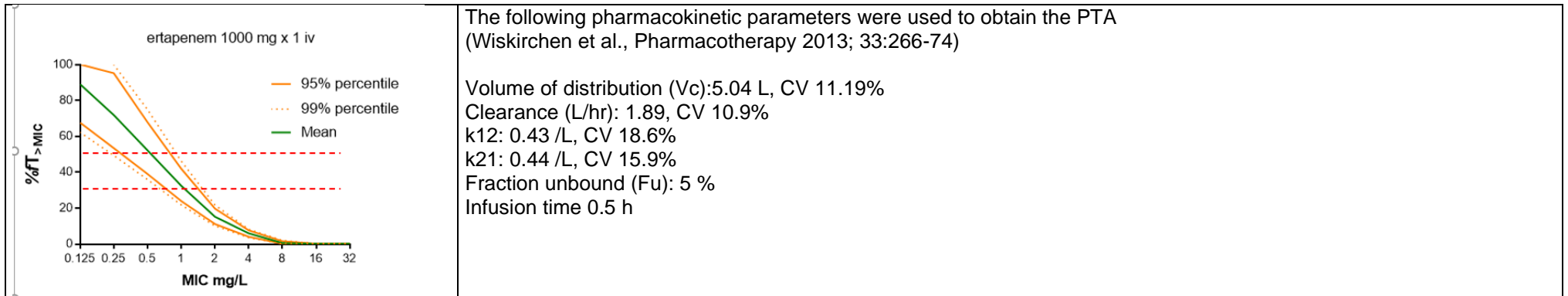
Pharmacokinetics

PK parameter	Pharmacological studies		Efficacy studies	
Dosage	1 g x 1			
C _{max} (mg/L)	150			
C _{min} (mg/L)	1			
Total body clearance (L/h)	1.6-1.8			
T _{1/2} (h), mean (range)	4			
AUC ₀₋₁₂ (mg.h/L)				
AUC ₀₋₂₄ (mg.h/L)	500-800			
AUC _{0-∞} (mg.h/L)				
Fraction unbound (%)	5			
Volume of distribution _{ss} (L/kg)	0.11			

Pharmacodynamics

Index	Various models	Various models				
	<i>Enterobacterales</i>	<i>S. pneumoniae</i>				
	Range	Range				
f%T>MIC for bacteriostasis	25-40	15-20				
f%T>MIC for 1-log ₁₀ kill	35-55	25-40				

Monte Carlo simulations



Clinical studies

Clinical trials have shown the efficacy of ertapenem in treatment of patients with septicaemia, post-operative sepsis, nosocomial pneumonia, community acquired pneumonia, intra-abdominal infections and complicated skin and soft tissue infections caused by micro-organisms categorized as wild type.

Clinical breakpoints

The clinical breakpoints for ertapenem can be found in the most recent version of the Breakpoint tables: https://www.eucast.org/clinical_breakpoints

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