

Fenotüüpiline meetod
karbapenemaasi produktsiooni
kinnitamiseks (*Enterobacteriaceae*)

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Skriiningu kriteeriumid revideerimisel



EUCAST guidelines for detection of resistance mechanisms and specific resistances of clinical and/or epidemiological importance

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Skriiningu kriteeriumid revideerimisel

Table 1. Clinical breakpoints and screening cut-off values for carbapenemase-producing Enterobacteriaceae (according to EUCAST methodology).

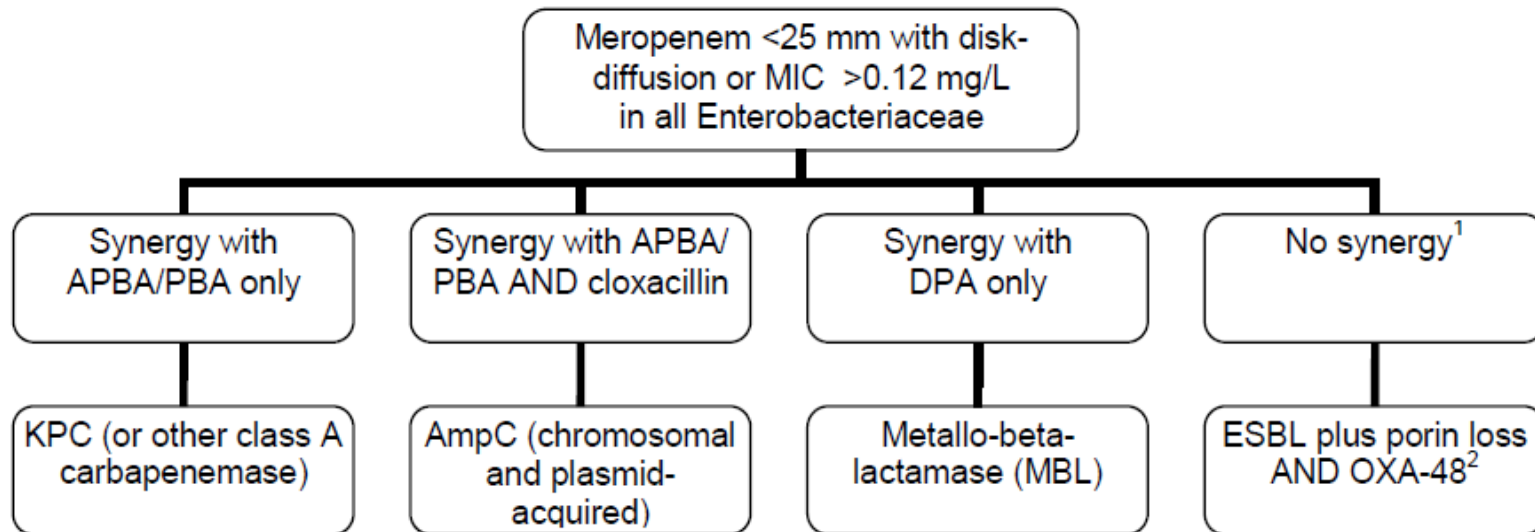
Carbapenem	MIC (mg/L)		Disk diffusion zone diameter (mm) with 10 µg disks	
	S/I breakpoint	Screening cut-off	S/I breakpoint	Screening cut-off
Meropenem ¹	≤2	>0.12	≥22	<25 ²
Imipenem ³	≤2	>1	≥22	<23
Ertapenem ⁴	≤0.5	>0.12	≥25	<25

¹Best balance of sensitivity and specificity

²In some cases zone diameters for OXA-48-producers are up to 26 mm, so **<27 mm** may be used as a screening cut-off during outbreaks caused by OXA-48-producing Enterobacteriaceae, but with reduction in specificity.

Algoritmi projekt

Figure 1. Algorithm for carbapenemase detection.



Abbreviations: APBA=aminophenyl boronic acid, PBA=phenyl boronic acid, DPA=dipicolinic acid (all of them β -lactamase inhibitors added to disks or tablets containing meropenem in combination disk testing assays)

¹ Combination of KPC and MBL can also produce no synergy. Normally these isolates will have very high resistance levels to carbapenems. They are easiest to detect with molecular methods.

² High-level temocillin resistance (MIC >32 mg/L (12, 18), tentative zone diameter ≤ 10 mm with temocillin 30 μ g disk (17)) is a phenotypic indicator of OXA-48 production.

KPC, MBL and OXA-48 confirmation KIT (ROSCO)

Karbapenemaaside ja *Enterobacteriaceae* oksatsillinaaside skriining ja määramine

Test tugineb põhimõttel, et kaks erinevat karbapenemaasi (KPC ja MBL) on inhibeeritavad erinevate ainete poolt. KPC või MBL kinnitamiseks kasutatakse meropenemi ilma ja koos MBL inhibiitoriga (dipicolinic acid), KPC / AmpC inhibiitoriga (phenylboronic acid) ja AmpC inhibiitoriga (cloxacillin). Viimane kombinatsioon (meropenem + cloxacillin) lubab eristada KPC ja AmpC produtseerijaid. Temocillin on lisatud oksatsillinaasi aktiivsuse (OXA-48) määramiseks. Tuleb märkida, et temotsilliini test kehtib ainult *Enterobacteriaceae* jaoks.

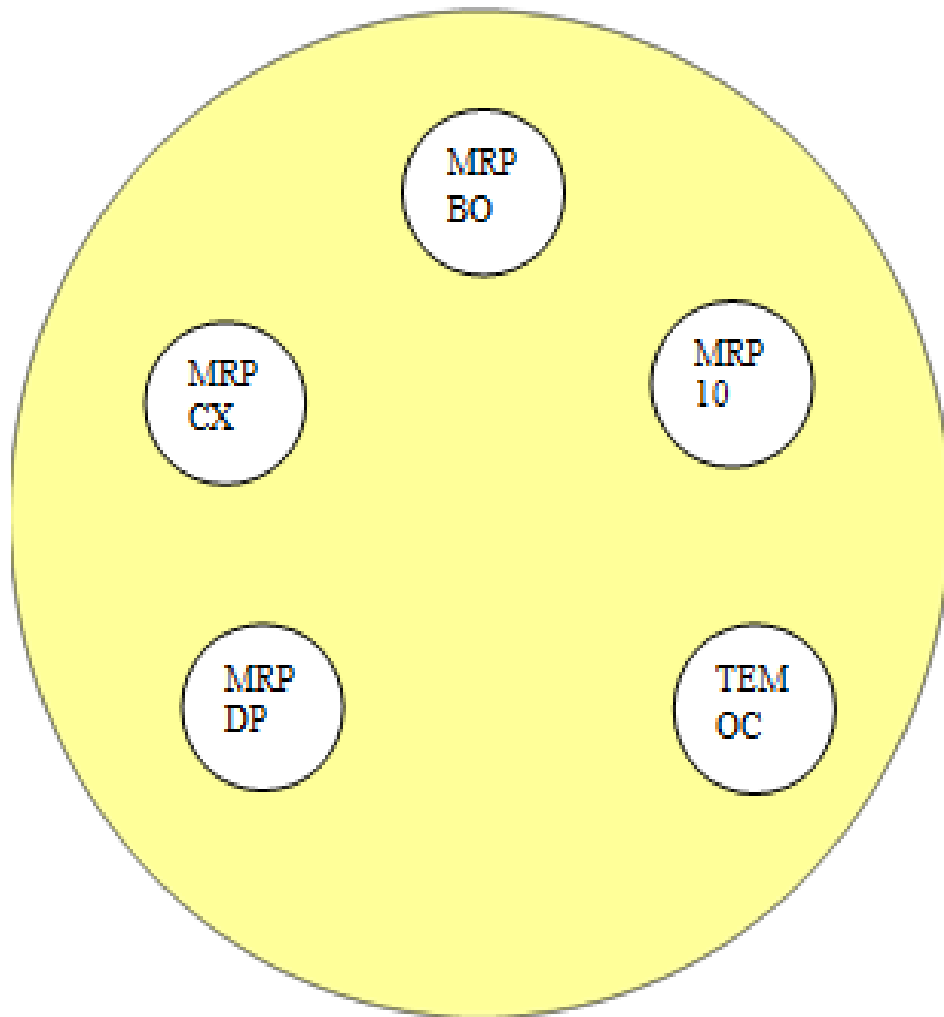
Kitis (REF 98015) sisaldub:

- Meropenem 10 µg (MRP10)
- Meropenem 10 µg + Phenylboronic acid (MRPBO)
- Meropenem 10 µg + Cloxacillin (MRPCX)
- Meropenem 10 µg + Dipicolinic acid (MRPDP)
- Temocillin 30 µg (TEMOC)

KPC, MBL and OXA-48 confirmation KIT (ROSCO)



Metoodika



MRP = meropenem

BO = phenylboronic acid

DP = dipicolinic acid

CX = cloxacillin

TEMOC = temocillin

Tulemuste tõlgendamine

Resistentsuse mehhanism	MRP BO tsoon - MRP CX tsoon	MRP ja muu diski tsooni vahe			
		MRP BO meropenem + phenylboronic	MRP CX meropenem + cloxacillin	MRP DP meropenem + dipicolinic acid	TEMOC temocillin
AmpC + poriini defekt		≥ 4 mm ja	≥ 5 mm	≤ 3 mm	≥ 12 mm
ESBL + poriini defekt		≤ 3 mm	≤ 3 mm	≤ 3 mm	≥ 12 mm
KPC		≥ 4 mm	≤ 3 mm	≤ 3 mm	variaabelne
	≥ 4 mm	ei tõlgendata			
MBL*		< 4 mm	≤ 3 mm	≥ 5 mm	variaabelne
OXA-48 ja sarnased		≤ 3 mm	≤ 3 mm	≤ 3 mm	tsoon puudub
OXA-48 + ESBL **		≤ 3 mm	≤ 3 mm	≤ 3 mm	tsoon puudub

* - uuritakse ainult CAZ resistentseid isolaate. CAZ-T isolaatidel võib saada valepositiivseid tulemusi MBL osas.

** - sünergism CAZ/Clav

Kui tüvi ei produtseeri ei AmpC, KPC ega MBL: kõik tsoonid 3 mm piires
OXA-48 näitab negatiivset tulemust, aga samal ajal on temocillin resistentne