



## What Pharmacodynamic Parameters for Which Drugs?

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The pharmacodynamics (PD) of antibiotics will be reviewed. Traditionally, several antibiotics have been monitored of their concentration or pharmacokinetics (PK). PD became even more important as it is more related to bacterial eradication or prevention of resistance. The primary measure of antibiotic activity is minimal inhibitory concentration (MIC). This parameter is integrated into PK measures such as peak concentration or area under the concentration time curve (AUC) to produce peak/MIC ratio, AUC/MIC ratio or time above MIC ( $T > MIC$ ). Another PD related measure important for the determination of dosing regimen is persistence of antibiotic effect such as post-antibiotic effect (PAE), subinhibitory (sub-MIC) effect, post-antibiotic sub-MIC effect (PA SME), post-MIC effect (PME).

The patterns of antibiotics can be classified according to those PD measures. For example, aminoglycoside, daptomycin, quinolones, and ketolides show concentration dependent killing and prolonged persistent effect. For these drugs, AUC/MIC or peak/MIC is important. But beta lactams, erythromycin and linezolid show time-dependent killing and minimal persistent effect. Therefore,  $T > MIC$  and maximizing exposure duration are important.

The application of PD as well as PK concept considering the host factors such as disease severity, organ function, or drug interaction will enable rational selection of antibiotic and choice of optimal dosage regimen. This can also enable prediction of efficacy, prevention of adverse effect and formulation development in the process of new drug development.