

Model extension

Parasite resistance

Decreased drug sensitivity

Adherence

Delayed or missed dose(s)

Food intake

Patient's random age and corresponding region-specific weight

Weight- or regional age-based dosing regimen

Original model

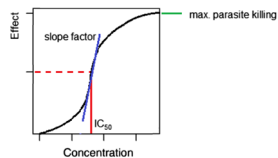
PD component: Drug concentration-effect curve

Depends on:

IC₅₀

Slope factor

Maximal parasite killing



PK component: Drug concentration-time curve

Depends on:

Volume of distribution

Elimination rate

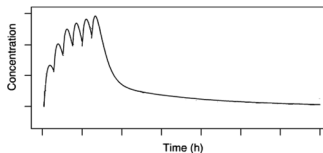
Dose intake time

Dose

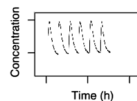
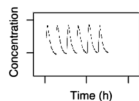
Absorption rate*

Conversion rate*

Partner drug



Artemisinin and DHA*



PK/PD model: Treatment outcome based on parasite numbers

$$P_t = P_0 e^{(a-f(t))t} \prod_{d=1}^r e^{-f(C_d)}$$

The number of parasites P_t at time t depends on

Initial parasite number P_0

Parasite growth rate a

Effect of patient immunity $f(I)$

Number of drugs r

Effect of drug $f(C)^*$