Outputs for Plasma Model - Mean Residence Time (MRT)

Summary Table for Mean Residence Time (MRT)

Parameters	CDISC Term	IV Bolus	IV Infusion	EV	Validate λ_z	Validate τ	Observed C_{last}	Predicted C_{last}
MRT_{last}	MRTIVLST	✓	✓	✗	-	-	✓	✗
MRT_{last}	MRTEVLST	✗	✗	✓	-	-	✓	✗
MRT_{∞}	MRTIVIFO	✓	✓	✗	✓	-	✓	✗
MRT_{∞}	MRTEVIFO	✗	✗	✓	✓	-	✓	✗
MRT'_{∞}	MRTIVIFP	✓	✓	✗	✓	-	✗	✓
MRT'_{∞}	MRTEVIFP	✗	✗	✓	✓	-	✗	✓

Note: Rows highlighted in blue represent the default output, while the remaining rows are optional.

MRT_{last}

MRT_{last} is defined as the mean residence time based on observed data only, which is generally used when λ_z fitting fails or is unreliable. It is a robust, non-extrapolated metric.

For IV Bolus,



For IV Infusion, MRT_{last} is adjusted by subtracting half the infusion duration (T_i),



For Extravascular, MRT_{last} follows the same derivation as IV Bolus, however, it represents not only the process of distribution and elimination but also absorption,



$MRT_{?}$

MRT_{∞} is defined as the mean residence time extrapolated to infinite per observed C_{last}, which requires a valdiate λ_z.

For IV Bolus,



For IV Infusion,



For Extravascular,



$MRT'_{?}$

MRT'_{∞} is defined as the mean residence time extrapolated to infinite per predicted C_{last}, which is used for sensitivity analysis when C_{last} is considered as outlier.

During the derivation, replace C_{last} with C_{pred} (including AUC_{pred} and $AUMC_{pred}$ accordingly).

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