Controlled Values for PharmML Annotation Properties in DDMoRe
Implementation version: 1.3.0

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DDMoRe M66 – August 2016

1 Namespace used

- **pkpd** http://www.ddmore.org/ontologies/ontology/pkpd-ontology

- **ncit** http://ncicb.nci.nih.gov/xml/owl/EVS/Thesaurus.owl

- **obo** obo http://purl.obolibrary.org/obo/

2 Controlled Annotating Values

wat:model-origin-of-code-in-literature-controlled

Yes
No

wat:model-implementation-conforms-to-literature-controlled

Yes
No

ps:model-modelling-question

Patient Population Selection and Bridging between Population (Pediatrics, Elderly, Obese),
pkpd_0006035
Candidate Comparison, Selection, Human Dose Prediction, pkpd_0006027
Mechanistic Understanding, pkpd_0006026
Therapeutic Drug Monitoring, pkpd_0006041
Pharmaco-economic, pkpd_0006038
Study Design Optimization, pkpd_0006028

25　Pharmaco-epidemiologic, pkpd_0006039

26　Diagnostic model, pkpd_0006042

27　Risk & Benefit Characterization, Outcome Prediction (Clinical & design Viability), pkpd_0006032

28　Disease Progression model, pkpd_0006036

29　Combination Therapy Dose Selection, pkpd_0006031

30　Similarity Assessment (MVC, Biosimilar, Formulation), pkpd_0006030

31　Dose & Schedule Selection and Label Recommendation, pkpd_0006034

32　Variability sources in PK and PD (CYP, Renal, Biomarkers), pkpd_0006029

33　Social-economic, pkpd_0006040

34　Comparator/Standard of Care Differentiation (Clinical & Commercial Viability), pkpd_0006033

35　Veterinary, pkpd_0006043

36　Clinical end-point, pkpd_0006037

37　**ps:model-research-stage**

38　1, Discovery stage, pkpd_0006003

39　1.1, Fundamental/Basic research, pkpd_0006004

40　1.2, Target selection & Validation, pkpd_0006005

41　1.3, Lead Generation & Optimization, pkpd_0006006

42　2, Preclinical development, pkpd_0000050

43　2.1, In silico, pkpd_0006007

44　2.2, In vitro, pkpd_0000051

45　2.3, In vivo, pkpd_0006008

46　3, Early clinical development (Phases I and II), pkpd_0006009

47　4, Approval phase/Registration trial (Phase III), pkpd_0006010

48　5, Life cycle management, pkpd_0006011

49　6, Clinical research & Therapeutic use, pkpd_0006012

50　**ps:model-field-purpose**

51　Respiratory, pkpd_0006018

52　CNS, pkpd_0001023

53　Gastroenterology, pkpd_0006021

54　Metabolism, pkpd_0006013

55　Cardiovascular, pkpd_0006016

56　Immunology, pkpd_0006023

57　Ophthalmology, pkpd_0006015

58　Vaccines, pkpd_00060025

59　Endocrinology, pkpd_0006020

60　Anti-infectives, pkpd_0001024

61　Rheumatology, pkpd_0006024

62 Diagnostics, pkpd_0006019
63 Haematology, pkpd_0006022
64 Oncology, pkpd_0000036

65 **ps:model-tasks-in-scope**

66 simulation, pkpd_0006000
67 estimation, pkpd_0006001
68 optimisation, pkpd_0006002

69 **ps:trialdesign-HasAssociatedDataOfType-DataPool**

70 Published data, pkpd_0000412
71 Observations, pkpd_0000411
72 Simulations, pkpd_0000413

73 **ps:model-HasAssociatedDataOfType-DataPool**

74 Published data, pkpd_0000412
75 Observations, pkpd_0000411
76 Simulations, pkpd_0000413

77 **ps:trialdesign-HasAssociatedOrganismType-DataPool**

78 dog, ncbit:9615
79 guinea pig, ncbit:10141
80 monkey, ncbit:9527
81 mouse, ncbit:10088
82 pig, ncbit:9823
83 rat, ncbit:10114
84 rabbit, ncbit:9986

85 **ps:model-HasAssociatedOrganismType-DataPool**

86 dog, ncbit:9615
87 guinea pig, ncbit:10141
88 monkey, ncbit:9527
89 mouse, ncbit:10088
90 pig, ncbit:9823
91 rat, ncbit:10114
92 rabbit, ncbit:9986

93 ps:trialdesign-HasAssociatedHumanGroupByMedicalStatus-DataPool

94 Healthy volunteer, pkpd_0008012

95 Patient, pkpd_0008011

96 ps:model-HasAssociatedHumanGroupByMedicalStatus-DataPool

97 Healthy volunteer, pkpd_0008012

98 Patient, pkpd_0008011

99 ps:modellingstep-modelrun-uses-software

100 Berkeley-Madonna, pkpd_0008000

101 Matlab, pkpd_0000390

102 Monolix, pkpd_0000391

103 NONMEM, pkpd_0000368

104 Openbugs, pkpd_0008001

105 R, pkpd_0001109

106 SAS, pkpd_0008002

107 Winbugs, pkpd_0008003

108 ps:model-modelrun-uses-software

109 Berkeley-Madonna, pkpd_0008000

110 Matlab, pkpd_0000390

111 Monolix, pkpd_0000391

112 NONMEM, pkpd_0000368

113 Openbugs, pkpd_0008001

114 R, pkpd_0001109

115 SAS, pkpd_0008002

116 Winbugs, pkpd_0008003

117 ps:trialdesign-HasAssociatedRouteOfAdministration-datapool

118 1, Parenteral, pkpd_0008016

119 1.1, Intravenous, pkpd_0008021

120 1.2, Subcutaneous, pkpd_0008022

121 1.3, Intra-muscular, pkpd_0008023

122 2, Enteral/Oral, pkpd_0008017

123 3, Topical, pkpd_0008018

124 3.1, Respiratory (i.e., inhalation), pkpd_0008020

125 3.2, Transdermal, pkpd_0008019

126 **ps:model-HasAssociatedRouteOfAdministration-datapool**

127 1, Parenteral, pkpd_0008016
128 1.1, Intravenous, pkpd_0008021
129 1.2, Subcutaneous, pkpd_0008022
130 1.3, Intra-muscular, pkpd_0008023
131 2, Enteral/Oral, pkpd_0008017
132 3, Topical, pkpd_0008018
133 3.1, Respiratory (i.e., inhalation), pkpd_0008020
134 3.2, Transdermal, pkpd_0008019

135 **ps:trialdesign-HasAssociatedDoseRegimen-DataPool**

136 Single dose, pkpd_0000423
137 Multiple doses, pkpd_0000424

138 **ps:model-HasAssociatedDoseRegimen-DataPool**

139 Single dose, pkpd_0000423
140 Multiple doses, pkpd_0000424

141 **ps:trialdesign-HasAssociatedDoseAmount-DataPool**

142 Fixed, pkpd_0008025
143 Flexible/adpted function of some criteria, pkpd_0008026

144 **ps:model-HasAssociatedDoseAmount-DataPool**

145 Fixed, pkpd_0008025
146 Flexible/adpted function of some criteria, pkpd_0008026

147 **ps:trialdesign-HasAssociatedDoseFrequency-DataPool**

148 QD (i.e. once per day), pkpd_0008028
149 BID (i.e. twice per day), pkpd_0008029
150 TID (i.e. Three times a day), pkpd_0008030
151 QOD (i.e. every other day), pkpd_0008031
152 Weekly, pkpd_0008032
153 QM (i.e. every month), pkpd_0008033

154 **ps:model-HasAssociatedDoseFrequency-DataPool**

155 QD (i.e. once per day), pkpd_0008028
156 BID (i.e. twice per day), pkpd_0008029
157 TID (i.e. Three times a day), pkpd_0008030
158 QOD (i.e. every other day), pkpd_0008031
159 Weekly, pkpd_0008032
160 QM (i.e. every month), pkpd_0008033

161 **ps:trialdesign-observed-variables-are-real-freetext**

162 Yes
163 No

164 **ps:model-observed-variables-are-real-freetext**

165 Yes
166 No

167 **ps:trialdesign-HasAssociatedSamplingDesign-DataPool**

168 Assumed steady state, pkpd_0008035
169 Non steady state, pkpd_0008037

170 **ps:model-HasAssociatedSamplingDesign-DataPool**

171 Assumed steady state, pkpd_0008035
172 Non steady state, pkpd_0008037

173 **ps:modeldefinition-HasAssociatedInputType**

174 1, Direct input (e.g., intravenous), pkpd_0008050
175 1.1, Bolus, pkpd_0000043
176 1.2, Infusion, pkpd_0000044
177 2, Indirect input (e.g., oral), pkpd_0008051
178 2.1, Absorption delay, pkpd_0008052

179 **ps:model-HasAssociatedInputType**

180 1, Direct input (e.g., intravenous), pkpd_0008050
181 1.1, Bolus, pkpd_0000043
182 1.2, Infusion, pkpd_0000044
183 2, Indirect input (e.g., oral), pkpd_0008051

184 2.1, Absorption delay, pkpd_0008052

185 **ps:modeldefinition-HasAssociatedDistributionModellingAttribute**
186 **-EnterohepaticRecycling**

187 Yes, pkpd_0008044
188 No, pkpd_0008045

189 **ps:modeldefinition-HasAssociatedDistributionModellingAttribute**
190 **-NonLinearTransport**

191 Yes, pkpd_0008046
192 No, pkpd_0008047

193 **ps:modeldefinition-HasAssociatedDistributionModellingAttribute**
194 **-NonLinearProteinBinding**

195 Yes, pkpd_0008048
196 No, pkpd_0008049

197 **ps:model-HasAssociatedDistributionModellingAttribute**
198 **-EnterohepaticRecycling**

199 Yes, pkpd_0008044
200 No, pkpd_0008045

201 **ps:model-HasAssociatedDistributionModellingAttribute**
202 **-NonLinearTransport**

203 Yes, pkpd_0008046
204 No, pkpd_0008047

205 **ps:model-HasAssociatedDistributionModellingAttribute**
206 **-NonLinearProteinBinding**

207 Yes, pkpd_0008048
208 No, pkpd_0008049

209 **ps:modeldefinition-HasAssociatedAbsorptionDelayModelType**

210 Lag time, pkpd_0000075
211 Transit model, pkpd_0008054

212 ps:model-HasAssociatedAbsorptionDelayModelType

213 Lag time, pkpd_0000075
214 Transit model, pkpd_0008054

215 ps:modeldefinition-HasAssociatedAbsorptionRateType

216 Zero order, pkpd_0000071
217 Sequential (e.g., zero order then first order), pkpd_0008055
218 First order, pkpd_0000072

219 ps:model-HasAssociatedAbsorptionRateType

220 Zero order, pkpd_0000071
221 Sequential (e.g., zero order then first order), pkpd_0008055
222 First order, pkpd_0000072

223 ps:modeldefinition-InputPresentsFormationFromOtherSubstance-string

224 Yes
225 No

226 ps:model-InputPresentsFormationFromOtherSubstance-string

227 Yes
228 No

229 ps:modeldefinition-HasAssociatedBioavailabilityType

230 1, Constant, pkpd_0007016
231 2, Non constant, pkpd_0007017
232 2.1, with dose, pkpd_0007019
233 2.2, with concentration, pkpd_0007021
234 2.3, with hepatic extraction (i.e., first-pass effect), pkpd_0007022
235 2.4, with time, pkpd_0007020

236 ps:model-HasAssociatedBioavailabilityType

237 1, Constant, pkpd_0007016
238 2, Non constant, pkpd_0007017
239 2.1, with dose, pkpd_0007019
240 2.2, with concentration, pkpd_0007021
241 2.3, with hepatic extraction (i.e., first-pass effect), pkpd_0007022

242 2.4, with time, pkpd_0007020

ps:modeldefinition-InputPresentsFormationFromOtherSubstanceType

244 Administrated drug, pkpd_0007028
245 Other, pkpd_0007027

ps:model-InputPresentsFormationFromOtherSubstanceType

247 Administrated drug, pkpd_0007028
248 Other, pkpd_0007027

ps:modeldefinition-InputPresentsFormationFromOtherSubstanceModelType

250 Linear, pkpd_0007030
251 Nonlinear, pkpd_0007031
252 Time-dependent, pkpd_0007032

ps:model-InputPresentsFormationFromOtherSubstanceModelType

254 Linear, pkpd_0007030
255 Nonlinear, pkpd_0007031
256 Time-dependent, pkpd_0007032

ps:modeldefinition-HasAssociatedEliminationModellingAttribute
-CompartmentOfElimination

259 Central, pkpd_0007043
260 Other than central, pkpd_0007044

ps:model-HasAssociatedEliminationModellingAttribute
-CompartmentOfElimination

263 Central, pkpd_0007043
264 Other than central, pkpd_0007044

ps:modeldefinition-HasAssociatedEliminationModellingAttribute
-TypeOfElimination

267 1, Linear with drug concentration, pkpd_0000054
268 2, Michaelis-Menten (MM), pkpd_0000055
269 3, Target Mediated Drug Disposition (TMDD), pkpd_0000500
270 4, Time dependent, pkpd_0007046

271 4.1, Induction, pkpd_0007047
272 4.2, Inhibition, pkpd_0007048
273 4.3, Other, pkpd_0008056

274 ps:model-HasAssociatedEliminationModellingAttribute
275 -TypeOfElimination

276 1, Linear with drug concentration, pkpd_0000054
277 2, Michaelis-Menten (MM), pkpd_0000055
278 3, Target Mediated Drug Disposition (TMDD), pkpd_0000500
279 4, Time dependent, pkpd_0007046
280 4.1, Induction, pkpd_0007047
281 4.2, Inhibition, pkpd_0007048
282 4.3, Other, pkpd_0008056

283 ps:modeldefinition-HasAssociatedModelledDrugFreeSystemType

284 1, Baseline, pkpd_0008058
285 1.1, Constant, pkpd_0008059
286 1.2, Non constant, pkpd_0008060
287 2, Model for physiological system (description of some systems of physiology in healthy
288 state), pkpd_0008061
289 3, Disease model (physiology system perturbed by the disease), pkpd_0008062
290 4, Other, pkpd_0008063

291 ps:model-HasAssociatedModelledDrugFreeSystemType

292 1, Baseline, pkpd_0008058
293 1.1, Constant, pkpd_0008059
294 1.2, Non constant, pkpd_0008060
295 2, Model for physiological system (description of some systems of physiology in healthy
296 state), pkpd_0008061
297 3, Disease model (physiology system perturbed by the disease), pkpd_0008062
298 4, Other, pkpd_0008063

299 ps:modeldefinition-HasDriverOfDrugEffectTypeAttribute

300 1, Dose, pkpd_0008065
301 2, Concentration profile, pkpd_0008066
302 3, Summary measure, pkpd_0008067
303 3.1, Average concentration, pkpd_0008068
304 3.2, Minimal concentration or Through or pre-dose, pkpd_0008069

305 3.3, Maximal concentration, pkpd_0008070

306 3.4, AUC Over Dosing Interval, pkpd_0008071

307 3.5, Time over a threshold concentration, pkpd_0008072

308 3.6, Other, pkpd_0008073

309 ps:model-HasDriverOfDrugEffectTypeAttribute

310 1, Dose, pkpd_0008065

311 2, Concentration profile, pkpd_0008066

312 3, Summary measure, pkpd_0008067

313 3.1, Average concentration, pkpd_0008068

314 3.2, Minimal concentration or Through or pre-dose, pkpd_0008069

315 3.3, Maximal concentration, pkpd_0008070

316 3.4, AUC Over Dosing Interval, pkpd_0008071

317 3.5, Time over a threshold concentration, pkpd_0008072

318 3.6, Other, pkpd_0008073

319 ps:modeldefinition-HasShapeOfDrugEffectTypeAttribute

320 Linear relation, pkpd_0008075

321 Emax/Imax, pkpd_0008076

322 Sigmoid Emax/Imax, pkpd_0008077

323 Other, pkpd_0008078

324 ps:model-HasShapeOfDrugEffectTypeAttribute

325 Linear relation, pkpd_0008075

326 Emax/Imax, pkpd_0008076

327 Sigmoid Emax/Imax, pkpd_0008077

328 Other, pkpd_0008078

329 ps:modeldefinition-HasTemporalRelationBetweenDrugEffect
330 AndResponseTypeAttribute

331 1, Direct, pkpd_0008080

332 2, Indirect, pkpd_0008081

333 2.1, Affecting production of response (kin), pkpd_0008082

334 2.2, Affecting elimination of response (kout), pkpd_0008083

335 3, Effect compartment, pkpd_0008084

336 4, Binding model (i.e., to enzyme/receptor), pkpd_0008085

337 5, Tolerance phenomena, pkpd_0008086

338 6, Other, pkpd_0008087

ps:model-HasTemporalRelationBetweenDrugEffect AndResponseTypeAttribute

1, Direct, pkpd_0008080

2, Indirect, pkpd_0008081

2.1, Affecting production of response (kin), pkpd_0008082

2.2, Affecting elimination of response (kout), pkpd_0008083

3, Effect compartment, pkpd_0008084

4, Binding model (i.e., to enzyme/receptor), pkpd_0008085

5, Tolerance phenomena, pkpd_0008086

6, Other, pkpd_0008087

ps:modeldefinition-HasModelForResponseType

1, Binary categorical observed variable , pkpd_0007051

1.1, Logistic regression model, pkpd_0007052

1.2, Markov model, pkpd_0007053

2, Ordered categorical observed variable, pkpd_0007054

2.1, Proportional odds model, pkpd_0007055

2.2, Differential odds model, pkpd_0007056

2.3, Markov model, pkpd_0007057

3, Non-ordered categorical observed variable, pkpd_0007058

3.1, Markov model, pkpd_0007059

4, Count or frequency categorical observed variable, pkpd_0007060

4.1, Poisson distribution model, pkpd_0007061

4.2, Zero-inflated Poisson distribution model, pkpd_0007062

4.3, Truncated poisson model, pkpd_0007063

4.4, Generalized poisson model, pkpd_0007064

4.5, Negative binomial model, pkpd_0007065

4.6, Zero-inflated negative binomial model, pkpd_0007066

4.7, Markov model, pkpd_0007067

5, Time-to-event observed variable, pkpd_0007068

5.1, Time-to-event single event observed variable, pkpd_0007069

5.1.1, Semi-parametric survival model , pkpd_0007070

5.1.1.1, Cox model, pkpd_0007071

5.1.2, Parametric survival model, pkpd_0007072

5.1.2.1, Exponential distribution model, pkpd_0007073

5.1.2.2, Weibull distribution model, pkpd_0007074

5.1.2.3, Log-normal distribution model, pkpd_0007075

5.1.2.4, Gamma distribution model, pkpd_0007076

5.1.2.5, Gompertz model, pkpd_0007077

377 5.2, Time-to-event repeated event observed variable, pkpd_0007078

378 5.2.1, Markov model, pkpd_0007079

379 **ps:model-HasModelForResponseType**

380 1, Binary categorical observed variable , pkpd_0007051

381 1.1, Logistic regression model, pkpd_0007052

382 1.2, Markov model, pkpd_0007053

383 2, Ordered categorical observed variable, pkpd_0007054

384 2.1, Proportional odds model, pkpd_0007055

385 2.2, Differential odds model, pkpd_0007056

386 2.3, Markov model, pkpd_0007057

387 3, Non-ordered categorical observed variable, pkpd_0007058

388 3.1, Markov model, pkpd_0007059

389 4, Count or frequency categorical observed variable, pkpd_0007060

390 4.1, Poisson distribution model, pkpd_0007061

391 4.2, Zero-inflated Poisson distribution model, pkpd_0007062

392 4.3, Truncated poisson model, pkpd_0007063

393 4.4, Generalized poisson model, pkpd_0007064

394 4.5, Negative binomial model, pkpd_0007065

395 4.6, Zero-inflated negative binomial model, pkpd_0007066

396 4.7, Markov model, pkpd_0007067

397 5, Time-to-event observed variable, pkpd_0007068

398 5.1, Time-to-event single event observed variable, pkpd_0007069

399 5.1.1, Semi-parametric survival model , pkpd_0007070

400 5.1.1.1, Cox model, pkpd_0007071

401 5.1.2, Parametric survival model, pkpd_0007072

402 5.1.2.1, Exponential distribution model, pkpd_0007073

403 5.1.2.2, Weibull distribution model, pkpd_0007074

404 5.1.2.3, Log-normal distribution model, pkpd_0007075

405 5.1.2.4, Gamma distribution model, pkpd_0007076

406 5.1.2.5, Gompertz model, pkpd_0007077

407 5.2, Time-to-event repeated event observed variable, pkpd_0007078

408 5.2.1, Markov model, pkpd_0007079

409 **ps:trialdesign-HasStudiedSubstanceAtttibute**

410 Drug/Investigational agent/Hypothetical drug, C1909

411 No drug, C14165

412 Placebo, C753

413 Stimulus (ex: glucose tolerance test), C41210

414   ps:model-HasStudiedSubstanceAtttibute

415   Drug/Investigational agent/Hypothetical drug, C1909
416   No drug, C14165
417   Placebo, C753
418   Stimulus (ex: glucose tolerance test), C41210

419   ps:drug-TypeOfDrug1

420   Antibody orother biological drug, pkpd_0007173
421   Small molecule, pkpd_0007174

422   ps:drug-TypeOfDrug2

423   Antibody orother biological drug, pkpd_0007173
424   Small molecule, pkpd_0007174

425   ps:drug-TypeOfDrug3

426   Antibody orother biological drug, pkpd_0007173
427   Small molecule, pkpd_0007174

428   ps:drug-TypeOfDrug4

429   Antibody orother biological drug, pkpd_0007173
430   Small molecule, pkpd_0007174

431   ps:drug-TypeOfDrug5

432   Antibody orother biological drug, pkpd_0007173
433   Small molecule, pkpd_0007174

434   ps:trialdesign-hasInteractorByNickname-freetext

435   Drug1
436   Drug2
437   Drug3
438   Drug4
439   Drug5
440   OV1
441   OV2
442   OV3
443   OV4

444 OV5

ps:trialdesign-hasInteracteeByNickname-freetext

446 Drug1
447 Drug2
448 Drug3
449 Drug4
450 Drug5
451 OV1
452 OV2
453 OV3
454 OV4
455 OV5

ps:trialdesign-hasTypeOfModelComponentImpacted

457 1, PK, pkpd_0000006
458 1.1, Drug metabolism or transport, pkpd_0008101
459 1.1.1, Inhibition - reversible or irreversible, pkpd_0008102
460 1.1.2, Induction of enzymes or transporters, pkpd_0008103
461 1.2, Binding to plasma protein(s), pkpd_0008104
462 2, PD, pkpd_0000007

ps:model-hasTypeOfModelComponentImpacted

464 1, PK, pkpd_0000006
465 1.1, Drug metabolism or transport, pkpd_0008101
466 1.1.1, Inhibition - reversible or irreversible, pkpd_0008102
467 1.1.2, Induction of enzymes or transporters, pkpd_0008103
468 1.2, Binding to plasma protein(s), pkpd_0008104
469 2, PD, pkpd_0000007

ps:model-hasInteractorByNickname-freetext

471 Drug1
472 Drug2
473 Drug3
474 Drug4
475 Drug5
476 OV1
477 OV2

478 OV3
479 OV4
480 OV5

481 **ps:model-hasInteracteeByNickname-freetext**

482 Drug1
483 Drug2
484 Drug3
485 Drug4
486 Drug5
487 OV1
488 OV2
489 OV3
490 OV4
491 OV5

492 **ps:drug-hasDoseAmountUnit-Drug1**

493 mg, C28253
494 ug, C48152
495 IU (international unit), C48579
496 ml, C28254

497 **ps:drug-hasDoseAmountUnit-Drug2**

498 mg, C28253
499 ug, C48152
500 IU (international unit), C48579
501 ml, C28254

502 **ps:drug-hasDoseAmountUnit-Drug3**

503 mg, C28253
504 ug, C48152
505 IU (international unit), C48579
506 ml, C28254

507 **ps:drug-hasDoseAmountUnit-Drug4**

508 mg, C28253
509 ug, C48152

510 IU (international unit), C48579
511 ml, C28254

ps:drug-hasDoseAmountUnit-Drug5

513 mg, C28253
514 ug, C48152
515 IU (international unit), C48579
516 ml, C28254

ps:model-hasDoseAmountUnit-Drug1

518 mg, C28253
519 ug, C48152
520 IU (international unit), C48579
521 ml, C28254

ps:model-hasDoseAmountUnit-Drug2

523 mg, C28253
524 ug, C48152
525 IU (international unit), C48579
526 ml, C28254

ps:model-hasDoseAmountUnit-Drug3

528 mg, C28253
529 ug, C48152
530 IU (international unit), C48579
531 ml, C28254

ps:model-hasDoseAmountUnit-Drug4

533 mg, C28253
534 ug, C48152
535 IU (international unit), C48579
536 ml, C28254

ps:model-hasDoseAmountUnit-Drug5

mg, C28253

ug, C48152

IU (international unit), C48579

ml, C28254

ps:model-OVLinksToDrug-OV1

Drug1

Drug2

Drug3

Drug4

Drug5

ps:model-OVHasNature-OV1

Concentration, PATO_0000033

Score, C25338

ps:model-OVHasMatrixType-OV1

Blood, FMA_9670

Cerebrospinal Fluid (CSF), FMA_20935

Plasma, FMA_62970

Serum, FMA_63083

Urine, FMA_12274

ps:model-OVHasTypeOfObservedVariable-OV1

1, Continuous, pkpd_0000415

2, Categorical, pkpd_0000416

3, Count, pkpd_0000418

4, Frequency, pkpd_0008105

5, Time-to-event, pkpd_0000417

ps:model-OVLinksToDrug-OV2

Drug1

Drug2

Drug3

Drug4

Drug5

ps:model-OVHasNature-OV2

Concentration, PATO_0000033
Score, C25338

ps:model-OVHasMatrixType-OV2

Blood, FMA_9670
Cerebrospinal Fluid (CSF), FMA_20935
Plasma, FMA_62970
Serum, FMA_63083
Urine, FMA_12274

ps:model-OVHasTypeOfObservedVariable-OV2

1, Continuous, pkpd_0000415
2, Categorical, pkpd_0000416
3, Count, pkpd_0000418
4, Frequency, pkpd_0008105
5, Time-to-event, pkpd_0000417

ps:model-OVLinksToDrug-OV3

Drug1
Drug2
Drug3
Drug4
Drug5

ps:model-OVHasNature-OV3

Concentration, PATO_0000033
Score, C25338

ps:model-OVHasMatrixType-OV3

Blood, FMA_9670
Cerebrospinal Fluid (CSF), FMA_20935
Plasma, FMA_62970
Serum, FMA_63083
Urine, FMA_12274

599 ps:model-OVHasTypeOfObservedVariable-OV3

600 1, Continuous, pkpd_0000415
601 2, Categorical, pkpd_0000416
602 3, Count, pkpd_0000418
603 4, Frequency, pkpd_0008105
604 5, Time-to-event, pkpd_0000417

605 ps:model-OVLinksToDrug-OV4

606 Drug1
607 Drug2
608 Drug3
609 Drug4
610 Drug5

611 ps:model-OVHasNature-OV4

612 Concentration, PATO_0000033
613 Score, C25338

614 ps:model-OVHasMatrixType-OV4

615 Blood, FMA_9670
616 Cerebrospinal Fluid (CSF), FMA_20935
617 Plasma, FMA_62970
618 Serum, FMA_63083
619 Urine, FMA_12274

620 ps:model-OVHasTypeOfObservedVariable-OV4

621 1, Continuous, pkpd_0000415
622 2, Categorical, pkpd_0000416
623 3, Count, pkpd_0000418
624 4, Frequency, pkpd_0008105
625 5, Time-to-event, pkpd_0000417

626 ps:model-OVLinksToDrug-OV5

627 Drug1
628 Drug2
629 Drug3
630 Drug4

Drug5

ps:model-OVHasNature-OV5

Concentration, PATO_0000033
Score, C25338

ps:model-OVHasMatrixType-OV5

Blood, FMA_9670
Cerebrospinal Fluid (CSF), FMA_20935
Plasma, FMA_62970
Serum, FMA_63083
Urine, FMA_12274

ps:model-OVHasTypeOfObservedVariable-OV5

1, Continuous, pkpd_0000415
2, Categorical, pkpd_0000416
3, Count, pkpd_0000418
4, Frequency, pkpd_0008105
5, Time-to-event, pkpd_0000417

ps:structuralmodel-HasComponentType

PK, pkpd_0000006
PD, pkpd_0000007
PBPK, pkpd_0000012
Drug-Drug Interaction, pkpd_0008100

ps:model-HasComponentType

PK, pkpd_0000006
PD, pkpd_0000007
PBPK, pkpd_0000012
Drug-Drug Interaction, pkpd_0008100

ps:model-OVHasUnits-OV1

1, concentration, C48207
1.1, nM, C48517
1.2, uM, C48509
1.3, ng/mL, C67306

21

662   1.4, mg/mL, C42576

663   1.5, mg/dL, C67015

664   1.6, ug/mL, C67305

665   1.7, g/L, C42576

666   1.8, mg/L, C67306

667   1.9, number/L, C105515

668   "1.10", number/mL, C103452

669   1.11, IU/mL, C67377

670   1.12, IU/L, C67376

671   1.13, mIU/L, C67405

672   2, volume, C44279

673   2.1, L, C48505

674   2.2, mL, C28254

675   2.3, mm3, C48153

676   2.4, cm3, C28254

677   3, length, C42578

678   3.1, mm, C28251

679   3.2, cm, C49668

680   3.2, m, C41139

681   4, area, C48037

682   4.1, mm2, C65104

683   4.2, cm2, C48460

684   5, clearance, C48568

685   5.1, L/h, C69160

686   5.2, L/min, C67388

687   5.3, mL/h, C66962

688   6, rate, C25636

689   6.1, h-1, C66966

690   6.2, min-1, C66967

691   6.3, day-1, C66968

692   6.4, week-1, C67069

693   6.5, year-1, C74924

694   7, time, C42574

695   7.1, h, C25529

696   7.2, min, C48154

697   7.3, day, C25301

698   7.4, week, C29844

699   7.5, year, C29848

700   8, amount, C42579

701   8.1, g, C48155

702   8.2, mg, C28253

8.3, kg, C28252

8.4, International Unit (IU), C48579

ps:model-OVHasUnits-OV2

1, concentration, C48207

1.1, nM, C48517

1.2, uM, C48509

1.3, ng/mL, C67306

1.4, mg/mL, C42576

1.5, mg/dL, C67015

1.6, ug/mL, C67305

1.7, g/L, C42576

1.8, mg/L, C67306

1.9, number/L, C105515

"1.10", number/mL, C103452

1.11, IU/mL, C67377

1.12, IU/L, C67376

1.13, mIU/L, C67405

2, volume, C44279

2.1, L, C48505

2.2, mL, C28254

2.3, mm3, C48153

2.4, cm3, C28254

3, length, C42578

3.1, mm, C28251

3.2, cm, C49668

3.2, m, C41139

4, area, C48037

4.1, mm2, C65104

4.2, cm2, C48460

5, clearance, C48568

5.1, L/h, C69160

5.2, L/min, C67388

5.3, mL/h, C66962

6, rate, C25636

6.1, h-1, C66966

6.2, min-1, C66967

6.3, day-1, C66968

6.4, week-1, C67069

6.5, year-1, C74924

742 7, time, C42574
743 7.1, h, C25529
744 7.2, min, C48154
745 7.3, day, C25301
746 7.4, week, C29844
747 7.5, year, C29848
748 8, amount, C42579
749 8.1, g, C48155
750 8.2, mg, C28253
751 8.3, kg, C28252
752 8.4, International Unit (IU), C48579

753 **ps:model-OVHasUnits-OV3**

754 1, concentration, C48207
755 1.1, nM, C48517
756 1.2, uM, C48509
757 1.3, ng/mL, C67306
758 1.4, mg/mL, C42576
759 1.5, mg/dL, C67015
760 1.6, ug/mL, C67305
761 1.7, g/L, C42576
762 1.8, mg/L, C67306
763 1.9, number/L, C105515
764 "1.10", number/mL, C103452
765 1.11, IU/mL, C67377
766 1.12, IU/L, C67376
767 1.13, mIU/L, C67405
768 2, volume, C44279
769 2.1, L, C48505
770 2.2, mL, C28254
771 2.3, mm3, C48153
772 2.4, cm3, C28254
773 3, length, C42578
774 3.1, mm, C28251
775 3.2, cm, C49668
776 3.2, m, C41139
777 4, area, C48037
778 4.1, mm2, C65104
779 4.2, cm2, C48460
780 5, clearance, C48568

781 5.1, L/h, C69160
782 5.2, L/min, C67388
783 5.3, mL/h, C66962
784 6, rate, C25636
785 6.1, h-1, C66966
786 6.2, min-1, C66967
787 6.3, day-1, C66968
788 6.4, week-1, C67069
789 6.5, year-1, C74924
790 7, time, C42574
791 7.1, h, C25529
792 7.2, min, C48154
793 7.3, day, C25301
794 7.4, week, C29844
795 7.5, year, C29848
796 8, amount, C42579
797 8.1, g, C48155
798 8.2, mg, C28253
799 8.3, kg, C28252
800 8.4, International Unit (IU), C48579

801 **ps:model-OVHasUnits-OV4**

802 1, concentration, C48207
803 1.1, nM, C48517
804 1.2, uM, C48509
805 1.3, ng/mL, C67306
806 1.4, mg/mL, C42576
807 1.5, mg/dL, C67015
808 1.6, ug/mL, C67305
809 1.7, g/L, C42576
810 1.8, mg/L, C67306
811 1.9, number/L, C105515
812 "1.10", number/mL, C103452
813 1.11, IU/mL, C67377
814 1.12, IU/L, C67376
815 1.13, mIU/L, C67405
816 2, volume, C44279
817 2.1, L, C48505
818 2.2, mL, C28254
819 2.3, mm3, C48153

820 2.4, cm3, C28254
821 3, length, C42578
822 3.1, mm, C28251
823 3.2, cm, C49668
824 3.2, m, C41139
825 4, area, C48037
826 4.1, mm2, C65104
827 4.2, cm2, C48460
828 5, clearance, C48568
829 5.1, L/h, C69160
830 5.2, L/min, C67388
831 5.3, mL/h, C66962
832 6, rate, C25636
833 6.1, h-1, C66966
834 6.2, min-1, C66967
835 6.3, day-1, C66968
836 6.4, week-1, C67069
837 6.5, year-1, C74924
838 7, time, C42574
839 7.1, h, C25529
840 7.2, min, C48154
841 7.3, day, C25301
842 7.4, week, C29844
843 7.5, year, C29848
844 8, amount, C42579
845 8.1, g, C48155
846 8.2, mg, C28253
847 8.3, kg, C28252
848 8.4, International Unit (IU), C48579

849 **ps:model-OVHasUnits-OV5**

850 1, concentration, C48207
851 1.1, nM, C48517
852 1.2, uM, C48509
853 1.3, ng/mL, C67306
854 1.4, mg/mL, C42576
855 1.5, mg/dL, C67015
856 1.6, ug/mL, C67305
857 1.7, g/L, C42576
858 1.8, mg/L, C67306

859 1.9, number/L, C105515
860 "1.10", number/mL, C103452
861 1.11, IU/mL, C67377
862 1.12, IU/L, C67376
863 1.13, mIU/L, C67405
864 2, volume, C44279
865 2.1, L, C48505
866 2.2, mL, C28254
867 2.3, mm3, C48153
868 2.4, cm3, C28254
869 3, length, C42578
870 3.1, mm, C28251
871 3.2, cm, C49668
872 3.2, m, C41139
873 4, area, C48037
874 4.1, mm2, C65104
875 4.2, cm2, C48460
876 5, clearance, C48568
877 5.1, L/h, C69160
878 5.2, L/min, C67388
879 5.3, mL/h, C66962
880 6, rate, C25636
881 6.1, h-1, C66966
882 6.2, min-1, C66967
883 6.3, day-1, C66968
884 6.4, week-1, C67069
885 6.5, year-1, C74924
886 7, time, C42574
887 7.1, h, C25529
888 7.2, min, C48154
889 7.3, day, C25301
890 7.4, week, C29844
891 7.5, year, C29848
892 8, amount, C42579
893 8.1, g, C48155
894 8.2, mg, C28253
895 8.3, kg, C28252
896 8.4, International Unit (IU), C48579