Interactions with Experimental COVID-19 Therapies

Please check www.covid19-druginteractions.org for updates.

Please note that if a drug is not listed it cannot automatically be assumed it is safe to coadminister. No recommendation to use experimental therapy for COVID-19 is made. Drug interaction data for many agents are limited or absent; therefore, risk-benefit assessment for any individual patient rests with prescribers.

Contents

Key to abbreviations

ATV	Atazanavir	CLQ	Chloroquine
LPV/r	Lopinavir/ritonavir	HCLQ	Hydroxychloroquine
RDV	Remdesivir	NITAZ	Nitazoxanide
FAVI	Favipiravir	RBV	Ribavirin
		TCZ	Tocilizumab

Colour Legend

These drugs should not be coadministered
Potential interaction which may require a dose adjustment or close monitoring.
Potential interaction likely to be of weak intensity. Additional action/monitoring or dosage adjustment unlikely to be required.
No clinically significant interaction expected

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Anaesthetics & Muscle Relaxants

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Alcuronium	↔	↔	↔	↑	↔	↔	↔	↔	↔
Bupivacaine	↑	↑	↔	↔	↔	↔	↔	↔	↓
Cisatracurium	↔	↔	↔	↔	↔	↔	↔	↔	↔
Desflurane	↔	↔	↔	↔	↔	↔	↔	↔	↔
Dexmedetomidine	↔	↓	↔	↔	↔	↔	↔	↔	↔
Enflurane	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ephedrine	↔	↔	↔	↔	↔	↔	↔	↔	↔
Etidocaine	↑	↑	↔	↔	↔	↔	↔	↔	↓
Halothane	↔	↔	↔	↔	↔	↔	↔	↔	↔
Isoflurane	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ketamine	↑	↑	↔	↔	↔	↔	↔	↔	↓
Minaxolone	↑	↑	↔	↔	↔	↔	↔	↔	↔
Nitrous oxide	↔	↔	↔	↔	↔	↔	↔	↔	↔
Propofol	↔ ♥	↓ ♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Rocuronium	↑	↑	↔	↔	↔	↔	↔	↔	↔
Sevoflurane	↔ ♥	↔ ♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Sufentanil	↑	↑	↔	↔	↔	↔	↔	↔	↓
Suxamethonium (succinylcholine)	↔	↔	↔	↔	↔	↔	↔	↔	↔
Tetracaine	↔	↔	↔	↔	↔	↔	↔	↔	↔
Thiopental	↔	↔	↔	↔	↔	↔	↔	↔	↔
Tizanidine	↔ ♥	↓ ♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Vecuronium	↔	↔	↔	↔	↔	↔	↔	↔	↔

Text Legend

↑ Potential increased exposure of the comedication
↓ Potential decreased exposure of the comedication
⇑ Potential increased exposure of COVID drug
⇓ Potential decreased exposure of COVID drug
↔ No significant effect

♥ One or both drugs may cause QT and/or PR prolongation. ECG monitoring is advised if coadministered.

Numbers refer to increase or decrease in AUC as observed in drug-drug interaction studies.

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Analgesics

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Alfentanil	↑	↑	↔	↔	↔	↔	↔	↔	↓
Aspirin	↔	↔	↔	↔	↔	↔	↔	↔	↔
Buprenorphine	↑	↑ ~2%	↔	↔	↔	↔	↔	↔	↓
Celecoxib	↔	↔	↔	↔	↔	↔	↔	↔	↔
Codeine	↔	↑	↔	↔	↔	↔	↔	↔	↔
Dextropropoxyphene	↑	↑	↔	↔	↔ ♥	↔ ♥	↔	↔	↓
Diamorphine (diacetylmorphine)	↔	↓	↔	↔	↔	↔	↔	↔	↔
Diclofenac	↔	↔	↔	↔	↔	↔	↔	↔	↔
Dihydrocodeine	↑	↑↓	↔	↔	↔	↔	↔	↔	↔
Fentanyl	↑	↑	↔	↔	↔	↔	↔	↔	↓
Hydrocodone	↑↓	↑↓	↔	↔	↑	↑	↔	↔	↔
Hydromorphone	↔	↓	↔	↔	↔	↔	↔	↔	↔
Ibuprofen	↔	↔	↔	↔	↔	↔	↔	↔	↔
Mefenamic acid	↔	↔	↔	↔	↔	↔	↔	↔	↔
Methadone	↔ ♥	↓53% ♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Morphine	↔	↓	↔	↔	↔	↔	↔	↔	↔
Naproxen	↔	↔	↔	↔	↔	↔	↔	↔	↔
Nimesulide	↔	↔	↔	↔	↔	↔	↔	↔	↔
Oxycodone	↑	↑ 160%	↔	↔	↔	↔	↔	↔	↓
Paracetamol (Acetaminophen)	↔	↔	↔	↑14-16%	↔	↔	↔	↔	↔
Pethidine (Meperidine)	↑	↓	↔	↔	↔	↔	↔	↔	↔
Piroxicam	↔	↔	↔	↔	↔	↔	↔	↔	↔
Remifentanil	↔	↔	↔	↔	↔	↔	↔	↔	↔
Tapentadol	↔	↔	↔	↔	↔	↔	↔	↔	↔
Tramadol	↑	↑	↔	↔	↔	↔	↔	↔	↔

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Notes:

Codeine and Tramadol + LPV/r
Potential decrease of the analgesic effect due to the reduced conversion to the active metabolite.

Diamorphine and Morphine + ATV
No effect on systemic exposure but inhibition of P-gp by atazanavir at the blood-brain barrier could potentiate the opiate effect in the CNS.

Diamorphine and Morphine + LPV/r
Ritonavir could reduce systemic exposure of diamorphine and morphine due to induction of glucuronidation. Ritonavir also inhibits P-gp at the blood-brain barrier and could potentiate the opiate effect in the CNS.

Hydrocodone + ATV or LPV/r
Hydrocodone concentrations are increased, but concentrations of the metabolite hydromorphone (which has also analgesic activity) are reduced.

Paracetamol + FAVI
The daily dose of paracetamol in adults should be no more than 3000 mg/day (rather than 4000 mg/day).

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Antiarrhythmics

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Amiodarone	↑♥	↑♥	↔	↔	↑♥	↑♥	↔	↔	↓
Bepridil	↑♥	↑♥	↔	↔	↑♥	↑♥	↔	↔	↔
Disopyramide	↑♥	↑♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Dofetilide	↑♥	↑♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Flecainide	↑♥	↑♥	↔	↔	↑♥	↑♥	↔	↔	↔
Lidocaine (Lignocaine)	↑	↑	↔	↔	↔	↔	↔	↔	↔
Mexiletine	↔	↑	↔	↔	↑♥	↑♥	↔	↔	↔
Propafenone	↑	↑	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Quinidine	↑	↑	↔	↔	↔ ♥	↔ ♥	↔	↔	↓

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Notes:

Amiodarone + LPV/r
The European product label for LPV/r contraindicates coadministration but the US product label suggests caution and concentration monitoring of amiodarone.

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Antibacterials

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Azithromycin	↑ ♥	↔ ♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Bedaquiline	↑ ♥	↑22% ♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Cefalexin	↔	↔	↔	↑	↔	↔	↔	↔	↔
Clarithromycin	↑ ⇑ ♥	↑ ♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Clindamycin	↑	↑	↔	↔	↔	↔	↔	↔	↔
Clofazimine	↔ ♥	↔ ♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Delamanid	↑ ♥	↑ ♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Erythromycin	↑ ♥	↑ ♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Flucloxacillin	↔	↔	↔	↑	↔	↔	↔	↔	↔
Isoniazid	↔	↔	↔	↔	↔	↔	↔	↔	↔
Levofloxacin	↔ ♥	↔ ♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Linezolid	↔	↔	↔	↔	↔	↔	↔	↔	↔
Metronidazole	↔	↔	↔	↔	↔	↔	↔	↔	↔
Moxifloxacin	↑ ♥	↓ ♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Ofloxacin	↔ ♥	↔ ♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Penicillins	↔	↔	↔	↑	↔	↔	↔	↔	↔
Piperacillin	↔	↔	↔	↑	↔	↔	↔	↔	↔
Pyrazinamide	↔	↔	↔	↔	↔	↔	↔	↔	↔
Rifabutin	↑	↑	⇓	↔	⇓	⇓	↔	↔	↔
Rifampicin	⇓	⇓ 75%	⇓	↔	⇓	⇓	↔	↔	↔
Rifapentine	⇓	⇓	⇓	↔	⇓	⇓	↔	↔	↔
Sulfadiazine	↔	↓	↔	↔	↔	↔	↔	↔	↔
Tazobactam	↔	↔	↔	↑	↔	↔	↔	↔	↔
Telithromycin	↑ ⇑ ♥	↑ ⇑ ♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Tinidazole	↑	↑	↔	↔	↔	↔	↔	↔	↔

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Notes:

No interactions are expected with the COVID-19 therapies listed and the following antibacterials:
amikacin, amoxicillin, ampicillin, capreomycin, cefazolin, cefixime, cefotaxime, ceftazidime, ceftriaxone, chloramphenicol, ciprofloxacin, clavulanic acid, cloxacillin, cycloserine, dapsone, doxycycline, ertapenem, ethambutol, ethionamide, gentamicin, imipenem/cilastatin, kanamycin, meropenem, nitrofurantoin, para-aminosalicylic acid, rifaximin, spectinomycin, streptomycin, tetracyclines, trimethoprim/sulfamethoxazole, vancomycin.

Clarithromycin + ATV or LPV/r
A dose reduction of clarithromycin may be required for patients with impaired renal function. Refer to product labels for details.

Delamanid + ATV or LPV/r
Coadministration is expected to increase concentrations of DM-6705, a delamanid metabolite which is associated with QT prolongation. Frequent ECG monitoring is recommended.

Isoniazid + RBV
Use of isoniazid should be carefully monitored with patients with current chronic liver disease. Severe and sometimes fatal hepatitis associated with isoniazid therapy may occur and may develop even after many months of treatment.

Linezolid + RBV
Myelosuppression has been reported with both linezolid and ribavirin. Close monitoring of blood counts is recommended.

Linezolid + TCZ
Caution is required due to potential additive haematological toxicity.

Metronidazole and Tinidazole + LPV/r
No interaction is expected with lopinavir tablets. Coadministration is not recommended with lopinavir oral solution as it contains alcohol.

Pyrazinamide + FAVI
No effect on pyrazinamide concentrations but coadministration increased blood uric acid concentrations. Monitor uric acid.

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Anti-coagulant, Anti-platelet and Fibrinolytic

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Acenocoumarol	↔	↓	↔	↔	↔	↔	↑	↔	↓
Apixaban	↑	↑	↔	↔	↑	↑	↔	↔	↓
Argatroban	↔	↔	↔	↔	↔	↔	↔	↔	↔
Aspirin (anti-platelet)	↔	↔	↔	↔	↔	↔	↔	↔	↔
Betrixaban	↑♥	↑♥	↔	↔	↑	↑	↔	↔	↔
Clopidogrel	↓	↓	↔	↔	↔	↔	↔	↔	↓
Dabigatran	↑	↔ or ↓	↔	↔	↑	↑	↔	↔	↔
Dalteparin	↔	↔	↔	↔	↔	↔	↔	↔	↔
Dipyridamole	↑	↓	↔	↔	↔	↔	↔	↔	↔
Edoxaban	↑	↑	↔	↔	↑	↑	↔	↔	↔
Eltrombopag	↔	↓ 17%	↔	↔	↔	↔	↔	↔	↔
Enoxaparin	↔	↔	↔	↔	↔	↔	↔	↔	↔
Fondaparinux	↔	↔	↔	↔	↔	↔	↔	↔	↔
Heparin	↔	↔	↔	↔	↔	↔	↔	↔	↔
Phenprocoumon	↑	↑↓	↔	↔	↔	↔	↑	↔	↓
Prasugrel	↔	↔	↔	↔	↔	↔	↔	↔	↓
Rivaroxaban	↑	↑	↔	↔	↑	↑	↔	↔	↓
Streptokinase	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ticagrelor	↑	↑	↔	↔	↔	↔	↔	↔	↓
Warfarin	↑	↓	↔	↔	↔	↔	↑	↓	↓

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Notes:

Apixaban + LPV/r
The US product label for apixaban suggests to use apixaban at a reduced dose (2.5 mg twice daily) if needed.

Betrixaban + ATV or LPV/r
The US product label for betrixaban recommends for patients receiving or starting a strong P-gp inhibitor to reduce betrixaban dose and use an initial dose of 80 mg followed by 40 mg once daily.

Clopidogrel + ATV or LPV/r
Decreased conversion to active metabolite leading to non-responsiveness to clopidogrel. Prasugrel should be preferred to clopidogrel with ATV or LPV/r.

Edoxaban + ATV or LPV/r
The European product label for edoxaban states to consider a dose reduction of edoxaban from 60 mg to 30 mg with strong P-gp inhibitors, however, the US product label recommends no dose modification.

Prasugrel + ATV or LPV/r
Concentrations of active metabolite are reduced but without a significant reduction in prasugrel activity.

Vitamin K antagonists + ATV, LPV/r or NITAZ
Monitor INR with vitamin K antagonists (e.g., acenocoumarol, phenprocoumon, warfarin).

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Anticonvulsants

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Carbamazepine	↑⇓	↑⇓	⇓	↔	⇓	⇓	↔	↔	↓
Clonazepam	↑	↑	↔	↔	↔	↔	↔	↔	↔
Eslicarbazepine	⇓ ♥	⇓ ♥	⇓	↔	⇓	⇓	↔	↔	↔
Ethosuximide	↑	↑	↔	↔	↔	↔	↔	↔	↔
Gabapentin	↔	↔	↔	↔	↔	↔	↔	↔	↔
Lacosamide	↔ ♥	↔ ♥	↔	↔	↔	↔	↔	↔	↔
Lamotrigine	↔	↓ 50%	↔	↔	↔	↔	↔	↔	↔
Levetiracetam	↔	↔	↔	↔	↔	↔	↔	↔	↔
Oxcarbazepine	⇓	⇓	⇓	↔	⇓	⇓	↔	↔	↔
Perampanel	↑	↑	↔	↔	↔	↔	↔	↔	↔
Phenobarbital (Phenobarbitone)	⇓	⇓	⇓	↔	⇓	⇓	↔	↔	↓
Phenytoin	⇓	⇓	⇓	↔	⇓	⇓	↑	↔	↓
Pregabalin	↔	↔	↔	↔	↔	↔	↔	↔	↔
Primidone	⇓	↓⇓	⇓	↔	⇓	⇓	↔	↔	↓
Retigabine	↔	↔	↔	↔	↔	↔	↔	↔	↔
Rufinamide	⇓	⇓	⇓	↔	⇓	⇓	↔	↔	↔
Sultiame	↑	↑	↔	↔	↔	↔	↔	↔	↔
Tiagabine	↑	↑	↔	↔	↔	↔	↔	↔	↔
Topiramate	↔	↔	↔	↔	↔	↔	↔	↔	↔
Valproate (Divalproex)	↔	⇑ 38%	↔	↔	↔	↔	↔	↔	↔
Vigabatrin	↔	↔	↔	↔	↔	↔	↔	↔	↔
Zonisamide	↔	↔	↔	↔	↔	↔	↔	↔	↔

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Notes:

Valproate + LPV/r

Case report of a 48% decrease in valproate concentration in previously stable patient who developed exacerbated mania on starting lopinavir/ritonavir; dose increase of valproate was required.

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Antidepressants

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Agomelatine	↔	↓	↔	↔	↔	↔	↔	↔	↔
Amitriptyline	↔ ♥	↑♥	↔	↔	↑♥	↑♥	↔	↔	↔
Bupropion	↔	↓ 57%	↔	↔	↔	↔	↔	↔	↔
Citalopram	↑♥	↑♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Clomipramine	↑♥	↑♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Desipramine	↔ ♥	↑ 5%♥	↔	↔	↑♥	↑♥	↔	↔	↔
Doxepin	↔	↑	↔	↔	↔	↔	↔	↔	↔
Duloxetine	↔	↑↓	↔	↔	↑	↑	↔	↔	↔
Escitalopram	↑♥	↑♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Fluoxetine	↔	↑	↔	↔	↑	↑	↔	↔	↔
Fluvoxamine	↔	↑	↔	↔	↑	↑	↔	↔	↔
Imipramine	↑♥	↑♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Lithium	↔ ♥	↔ ♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Maprotiline	↔ ♥	↑♥	↔	↔	↑♥	↑♥	↔	↔	↔
Mianserin	↑	↑	↔	↔	↑	↑	↔	↔	↔
Milnacipran	↔	↔	↔	↔	↔	↔	↔	↔	↔
Mirtazapine	↑	↑	↔	↔	↑	↑	↔	↔	↔
Nefazodone	↑⇑	↑	↔	↔	↔	↔	↔	↔	↔
Nortriptyline	↔ ♥	↑♥	↔	↔	↑♥	↑♥	↔	↔	↔
Paroxetine	↑↓ ?	↑↓ ?	↔	↔	↑	↑	↔	↔	↔
Phenelzine	↔	↔	↔	↔	↔	↔	↔	↔	↔
Reboxetine	↑	↑	↔	↔	↔	↔	↔	↔	↔
Sertraline	↑	↓	↔	↔	↔	↔	↔	↔	↔
St John's wort	⇓	⇓	⇓	↔	⇓	⇓	↔	↔	↔
Tranylcypromine	↑	↑	↔	↔	↔	↔	↔	↔	↔
Trazodone	↑♥	↑♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Trimipramine	↔	↑	↔	↔	↑	↑	↔	↔	↔
Venlafaxine	↑	↑	↔	↔	↑	↑	↔	↔	↔
Vortioxetine	↔	↑	↔	↔	↑	↑	↔	↔	↔

Text Legend

↑ Potential increased exposure of the comedication
↓ Potential decreased exposure of the comedication
⇑ Potential increased exposure of COVID drug
⇓ Potential decreased exposure of COVID drug
↔ No significant effect

♥ One or both drugs may cause QT and/or PR prolongation. ECG monitoring is advised if coadministered.

Numbers refer to increase or decrease in AUC as observed in drug-drug interaction studies.

Key to abbreviations

ATV	Atazanavir	CLQ	Chloroquine
LPV/r	Lopinavir/ritonavir	HCLQ	Hydroxychloroquine
RDV	Remdesivir	NITAZ	Nitazoxanide
FAVI	Favipiravir	RBV	Ribavirin
		TCZ	Tocilizumab

Colour Legend

These drugs should not be coadministered
Potential interaction which may require a dose adjustment or close monitoring.
Potential interaction likely to be of weak intensity. Additional action/monitoring or dosage adjustment unlikely to be required.
No clinically significant interaction expected

Please check www.covid19-druginteractions.org for updates.

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Anti-diabetics

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Acarbose	↔	↔	↔	↔	↔	↔	↔	↔	↔
Canagliflozin	↔	↓	↔	↔	↔	↔	↔	↔	↔
Dapagliflozin	↔	↔	↔	↔	↔	↔	↔	↔	↔
Dulaglutide	⇓	↔	↔	↔	↔	↔	↔	↔	↔
Empagliflozin	↔	↔	↔	↔	↔	↔	↔	↔	↔
Exanatide	⇓	↔	↔	↔	↔	↔	↔	↔	↔
Glibenclamide (Glyburide)	↑	↑	↔	↔	↔	↔	↔	↔	↔
Gliclazide	↔	↓	↔	↔	↔	↔	↔	↔	↔
Glimepiride	↔	↓	↔	↔	↔	↔	↔	↔	↔
Glipizide	↔	↓	↔	↔	↔	↔	↔	↔	↔
Insulin	↔	↔	↔	↔	↔	↔	↔	↔	↔
Linagliptin	↔	↑	↔	↔	↔	↔	↔	↔	↔
Liraglutide	⇓	↔	↔	↔	↔	↔	↔	↔	↔
Metformin	↔	↔	↔	↔	↔	↔	↔	↔	↔
Nateglinide	↑	↑↓	↔	↔	↔	↔	↔	↔	↔
Pioglitazone	↑	↑	↔	↑	↔	↔	↔	↔	↔
Repaglinide	↑	↑	↔	↑ 52%	↔	↔	↔	↔	↔
Rosiglitazone	↔	↓	↔	↑	↔	↔	↔	↔	↔
Saxagliptin	↑	↑	↔	↔	↔	↔	↔	↔	↔
Sitagliptin	↑	↑	↔	↔	↔	↔	↔	↔	↔
Tolbutamide	↔	↓	↔	↔	↔	↔	↔	↔	↔
Vildagliptin	↔	↔	↔	↔	↔	↔	↔	↔	↔

Text Legend

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⇑ Potential increased exposure of COVID drug
⇓ Potential decreased exposure of COVID drug
↔ No significant effect

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Numbers refer to increase or decrease in AUC as observed in drug-drug interaction studies.

Notes:

Canagliflozin +LPV/r
If coadministration is deemed necessary, increasing canagliflozin to 300 mg once daily may be considered if patients are currently tolerating canagliflozin 100 mg once daily, have an eGFR ≥60 mL/min/1.73m^2 or CrCl ≥60 mL/min, and require additional glycaemic control. Other glucose-lowering therapies should be considered for patients with an eGFR 45 mL/min/1.73m^2 to <60 mL/min/1.73m^2 or CrCl 45 mL/min to <60 mL/min taking canagliflozin 100 mg who are receiving concurrent therapy with a UGT enzyme inducer and who require additional glycaemic control.

Linagliptin + LPV/r
The increase in linagliptin exposure is not considered clinically significant as it is mainly eliminated unchanged and has a large safety window.

Saxagliptin + ATV or LPV/r:
The US product label for saxagliptin states the recommended dose of saxagliptin to be 2.5 mg once daily when coadministered with strong CYP3A4/5 inhibitors.

Sitagliptin + ATV or LPV/r
The increase in sitagliptin exposure is not considered clinically significant as it is mainly eliminated unchanged and has a large safety window.

Key to abbreviations

ATV	Atazanavir	CLQ	Chloroquine
LPV/r	Lopinavir/ritonavir	HCLQ	Hydroxychloroquine
RDV	Remdesivir	NITAZ	Nitazoxanide
FAVI	Favipiravir	RBV	Ribavirin
		TCZ	Tocilizumab

Colour Legend

These drugs should not be coadministered
Potential interaction which may require a dose adjustment or close monitoring.
Potential interaction likely to be of weak intensity. Additional action/monitoring or dosage adjustment unlikely to be required.
No clinically significant interaction expected

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Antifungals

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Amphotericin B	↔	↔	↔	↔	↔	↔	↔	↔	↔
Anidulafungin	↔	↔	↔	↔	↔	↔	↔	↔	↔
Caspofungin	↑	↔	↔	↔	↔	↔	↔	↔	↔
Fluconazole	↔	↔	↔	↔	⇑	⇑	↔	↔	↔
Flucytosine	↔	↔	↔	↔	↔	↔	↔	↔	↔
Griseofulvin	⇓	⇓	↔	↔	⇓	⇓	↔	↔	↔
Isavuconazole	↑	↑ 96%	↔	↔	⇑	⇑	↔	↔	↔
Itraconazole	↑	↑	↔	↔	⇑	⇑	↔	↔	↔
Ketoconazole	↑	↑	↔	↔	⇑	⇑	↔	↔	↔
Micafungin	↔	↔	↔	↔	↔	↔	↔	↔	↔
Miconazole	↔	↔	↔	↔	↔	↔	↔	↔	↔
Nystatin	↔	↔	↔	↔	↔	↔	↔	↔	↔
Posaconazole	⇑ 270%	⇑	↔	↔	⇑	⇑	↔	↔	↔
Terbinafine	↑	↑	↔	↔	↔	↔	↔	↔	↔
Voriconazole	↓⇓	↑↓⇑	↔	↔	⇑	⇑	↔	↔	↔

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⇑ Potential increased exposure of COVID drug
⇓ Potential decreased exposure of COVID drug
↔ No significant effect

♥ One or both drugs may cause QT and/or PR prolongation. ECG monitoring is advised if coadministered.

Numbers refer to increase or decrease in AUC as observed in drug-drug interaction studies.

Notes:

Amphotericin B + RBV
Amphotericin B, particularly conventional formulations, can be associated with anaemia and myelosuppression which may be intensified when coadministered with ribavirin. Consider monitoring haematological parameters during treatment.

Griseofulvin + LPV/r
LPV/r oral solution contains alcohol. Consumption of alcohol in association with griseofulvin can result in a 'disulfram-like' type reaction. No such interaction is expected with LPV/r tablets.

Itraconazole or Ketoconazole + ATV or LPV/r
The daily dose of itraconazole or ketoconazole should not exceed 200 mg.

Voriconazole + ATV
The effect of atazanavir on voriconazole exposure is dependent on CYP2C19 metaboliser status. In the majority of patients decreases in both voriconazole and atazanavir exposures may be expected, leading to loss of therapeutic effect and possible development of resistance. The European SmPC for atazanavir recommends a patient's CYP2C19 genotype should be performed if feasible. In patients without a functional CYP2C19 allele, increased voriconazole exposures are expected.

Voriconazole + LPV/r
Coadministration may result in bidirectional interactions leading to increased concentrations of lopinavir/ritonavir and an increase or decrease in voriconazole. Administration of voriconazole with ritonavir (100 mg twice daily) decreased voriconazole AUC by 39%.

Key to abbreviations

ATV	Atazanavir	CLQ	Chloroquine
LPV/r	Lopinavir/ritonavir	HCLQ	Hydroxychloroquine
RDV	Remdesivir	NITAZ	Nitazoxanide
FAVI	Favipiravir	RBV	Ribavirin
		TCZ	Tocilizumab

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Anti-hypertensives – ACE inhibitors

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Benazepril	↑	↔	↔	↔	↔	↔	↔	↔	↔
Captopril	↔	↔	↔	↔	↔	↔	↔	↔	↔
Cilazapril	↔	↔	↔	↔	↔	↔	↔	↔	↔
Enalapril	↔	↔	↔	↔	↔	↔	↔	↔	↔
Fosinopril	↔	↑	↔	↔	↔	↔	↔	↔	↔
Lisinopril	↔	↔	↔	↔	↔	↔	↔	↔	↔
Perindopril	↔	↔	↔	↔	↔	↔	↔	↔	↔
Quinapril	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ramipril	↔	↔	↔	↔	↔	↔	↔	↔	↔
Trandolapril	↔	↔	↔	↔	↔	↔	↔	↔	↔

Anti-hypertensives – Angiotensin antagonists

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Candesartan	↔	↔	↔	↔	↔	↔	↔	↔	↔
Eprosartan	↔	↔	↔	↔	↔	↔	↔	↔	↔
Irbesartan	↔	↓	↔	↔	↔	↔	↔	↔	↔
Losartan	↔	↓	↔	↔	↔	↔	↔	↔	↔
Olmesartan	↔	↔	↔	↔	↔	↔	↔	↔	↔
Telmisartan	↔	↔	↔	↔	↔	↔	↔	↔	↔
Valsartan	↑	↑	↔	↔	↔	↔	↔	↔	↔

Anti-hypertensives – Diuretics

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Amiloride	↔	↔	↔	↔	↔	↔	↔	↔	↔
Bendroflumethiazide	↔	↔	↔	↔	↔	↔	↔	↔	↔
Chlortalidone	↔	↔	↔	↔	↔	↔	↔	↔	↔
Furosemide	↔	↔	↔	↔	↔	↔	↔	↔	↔
Hydrochlorothiazide	↔	↔	↔	↔	↔	↔	↔	↔	↔
Indapamide	↑	↑	↔	↔	↔	↔	↔	↔	↔
Metolazone	↔	↔	↔	↔	↔	↔	↔	↔	↔
Torasemide	↔	↓	↔	↔	↔	↔	↔	↔	↔
Xipamide	↔	↔	↔	↔	↔	↔	↔	↔	↔

Text Legend

↑ Potential increased exposure of the comedication
↓ Potential decreased exposure of the comedication
⇑ Potential increased exposure of COVID drug
⇓ Potential decreased exposure of COVID drug
↔ No significant effect

♥ One or both drugs may cause QT and/or PR prolongation. ECG monitoring is advised if coadministered.

Numbers refer to increase or decrease in AUC as observed in drug-drug interaction studies.

Key to abbreviations

ATV	Atazanavir	CLQ	Chloroquine
LPV/r	Lopinavir/ritonavir	HCLQ	Hydroxychloroquine
RDV	Remdesivir	NITAZ	Nitazoxanide
FAVI	Favipiravir	RBV	Ribavirin
		TCZ	Tocilizumab

Colour Legend

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No clinically significant interaction expected

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Anti-hypertensives – Other agents

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Aliskiren	↑	↑	↔	↔	↔	↔	↔	↔	↔
Clonidine	↔	↔	↔	↔	↔	↔	↔	↔	↔
Digoxin	↑♥	↑♥	↔	↔	↑	↑	↔	↔	↔
Dopamine	↔	↔	↔	↔	↔	↔	↔	↔	↔
Doxazosin	↑	↑	↔	↔	↔	↔	↔	↔	↔
Eplerenone	↑	↑	↔	↔	↔	↔	↔	↔	↔
Hydralazine	↔	↔	↔	↔	↔	↔	↔	↔	↔
Isosorbide dinitrate	↑	↑	↔	↔	↔	↔	↔	↔	↔
Ivabradine	↑	↑	↔	↔	↔♥	↔♥	↔	↔	↔
Labetalol	↑	↓	↔	↔	↔	↔	↔	↔	↔
Lacidipine	↑♥	↑♥	↔	↔	↔	↔	↔	↔	↔
Lercanidipine	↑	↑	↔	↔	↔	↔	↔	↔	↔
Methyldopa	↔	↔	↔	↔	↔	↔	↔	↔	↔
Moxonidine	↔	↔	↔	↑	↔	↔	↔	↔	↔
Prazosin	↑	↑	↔	↔	↔	↔	↔	↔	↔
Ranolazine	↑	↑	↔	↔	↔♥	↔♥	↔	↔	↔
Sacubitril	↑	↑	↔	↔	↔	↔	↔	↔	↔
Sodium nitroprusside	↔	↔	↔	↔	↔	↔	↔	↔	↔
Spironolactone	↔	↔	↔	↔	↔	↔	↔	↔	↔
Terazosin	↑	↑	↔	↔	↔	↔	↔	↔	↔

Text Legend

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↓ Potential decreased exposure of the comedication
⇑ Potential increased exposure of COVID drug
⇓ Potential decreased exposure of COVID drug
↔ No significant effect

♥ One or both drugs may cause QT and/or PR prolongation. ECG monitoring is advised if coadministered.

Numbers refer to increase or decrease in AUC as observed in drug-drug interaction studies.

Notes:

Doxazosin + ATV or LPV/r
For patients already taking doxazosin, monitor blood pressure and reduce doxazosin dose as needed if hypotension occurs on starting ATV or LPV/r.

Isosorbide nitrate + ATV or LPV/r
Decreased active metabolite.

Sacubitril + ATV or LPV/r
Increased active metabolite.

Terazosin + ATV or LPV/r
For patients already taking terazosin, monitor blood pressure and reduce terazosin dose as needed if hypotension occurs on starting ATV or LPV/r.

Key to abbreviations

ATV	Atazanavir	CLQ	Chloroquine
LPV/r	Lopinavir/ritonavir	HCLQ	Hydroxychloroquine
RDV	Remdesivir	NITAZ	Nitazoxanide
FAVI	Favipiravir	RBV	Ribavirin
		TCZ	Tocilizumab

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Anti-hypertensives – Pulmonary hypertension

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Ambrisentan	↑	↑	↔	↔	↔	↔	↔	↔	↔
Bosentan	↑⇓	↑	⇓	↔	↔	↔	↔	↔	↔
Epoprostenol	↔	↔	↔	↔	↔	↔	↔	↔	↔
Iloprost	↔	↔	↔	↔	↔	↔	↔	↔	↔
Macitentan	↑	↑	↔	↔	↔	↔	↔	↔	↔
Riociguat	↑	↑	↔	↔	↔	↔	↔	↔	↔
Selexipag	↔	↔	↔	↔	↔	↔	↔	↔	↔
Sildenafil	↑	↑	↔	↔	↔	↔	↔	↔	↔
Tadalafil	↑	↑	↔	↔	↔	↔	↔	↔	↔
Treprostinil	↔	↔	↔	↑	↔	↔	↔	↔	↔

Text Legend

↑ Potential increased exposure of the comedication
↓ Potential decreased exposure of the comedication
⇑ Potential increased exposure of COVID drug
⇓ Potential decreased exposure of COVID drug
↔ No significant effect

♥ One or both drugs may cause QT and/or PR prolongation. ECG monitoring is advised if coadministered.

Numbers refer to increase or decrease in AUC as observed in drug-drug interaction studies.

Notes:

Ambrisentan + ATV or LPV/r
Start ambrisentan at 5 mg and closely monitor the patient for tolerability.

Bosentan + LPV/r
When coadministered patients should be closely observed for bosentan toxicity, especially during the first week of co-administration. For patients on bosentan, the US product label for LPV/r suggests to discontinue bosentan at least 36 hours prior to initiation of LPV/r and after at least 10 days of LPV/r, to resume bosentan at 62.5 mg once daily or every other day based upon individual tolerability.

Riociguat + ATV or LPV/r
The European product label for riociguat does not recommend its use in presence of strong inhibitors of CYPs, P-gp and BCRP; the US product label recommends to start riociguat at a dose of 0.5 mg three times daily and to monitor for signs and symptoms of hypotension.

Tadalafil + ATV
The US product label for ATV suggests for patients receiving atazanavir for at least one week, to start tadalafil at 20 mg once daily and increase to 40 mg once daily based on individual tolerability. For patients on tadalafil, avoid the use of tadalafil when starting atazanavir. Stop tadalafil at least 24 hours before starting atazanavir. At least one week after starting atazanavir, resume tadalafil at 20 mg once daily and increase to 40 mg once daily based on individual tolerability.

Tadalafil + LPV/r
The European product label for LPV/r does not recommend tadalafil for the treatment of pulmonary arterial hypertension, but the US product label suggests for patients on tadalafil, to avoid use of tadalafil during the initiation of LPV/r and to stop tadalafil at least 24 hours prior to starting LPV/r. After at least one week following the initiation of LPV/r, resume tadalafil at 20 mg once daily. Increase to 40 mg once daily based upon individual tolerability.

Key to abbreviations

ATV	Atazanavir	CLQ	Chloroquine
LPV/r	Lopinavir/ritonavir	HCLQ	Hydroxychloroquine
RDV	Remdesivir	NITAZ	Nitazoxanide
FAVI	Favipiravir	RBV	Ribavirin
		TCZ	Tocilizumab

Colour Legend

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Antipsychotics/Neuroleptics

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Amisulpride	↔	↔	↔	↔	↔	↔	↔	↔	↔
Aripiprazole	↑	↑	↔	↔	↔	↔	↔	↔	↔
Asenapine	↑	↓	↔	↔	↔	↔	↔	↔	↔
Chlorpromazine	↔♥	↑♥	↔	↔	↑♥	↑♥	↔	↔	↔
Clozapine	↑♥	↑♥	↔	↔	↔♥	↔♥	↔	↔	↔
Fluphenazine	↔♥	↑♥	↔	↔	↑♥	↑♥	↔	↔	↔
Haloperidol	↑♥	↑♥	↔	↔	↔♥	↔♥	↔	↔	↔
Iloperidone	↑♥	↑♥	↔	↔	↔♥	↔♥	↔	↔	↔
Levomepromazine	↔♥	↑♥	↔	↔	↑♥	↑♥	↔	↔	↔
Olanzapine	↔	↓	↔	↔	↔	↔	↔	↔	↔
Paliperidone	↑	↑	↔	↔	↔	↔	↔	↔	↔
Perazine	↑	↑	↔	↔	↔	↔	↔	↔	↔
Periciazine	↑	↑	↔	↔	↔	↔	↔	↔	↔
Perphenazine	↑♥	↑♥	↔	↔	↑♥	↑♥	↔	↔	↔
Pimozide	↑♥	↑♥	↔	↔	↔♥	↔♥	↔	↔	↔
Pipotiazine	↔♥	↑♥	↔	↔	↔♥	↔♥	↔	↔	↔
Quetiapine	↑♥	↑♥	↔	↔	↔♥	↔♥	↔	↔	↔
Risperidone	↑♥	↑♥	↔	↔	↑♥	↑♥	↔	↔	↔
Sulpiride	↔♥	↔♥	↔	↔	↔♥	↔♥	↔	↔	↔
Thioridazine	↑♥	↑♥	↔	↔	↑♥	↑♥	↔	↔	↔
Tiapride	↔♥	↔♥	↔	↔	↔♥	↔♥	↔	↔	↔
Ziprasidone	↑♥	↑♥	↔	↔	↔♥	↔♥	↔	↔	↔
Zotepine	↑♥	↑♥	↔	↔	↔♥	↔♥	↔	↔	↔
Zuclopenthixol	↑♥	↑♥	↔	↔	↑♥	↑♥	↔	↔	↔

Text Legend

↑ Potential increased exposure of the comedication
↓ Potential decreased exposure of the comedication
⇑ Potential increased exposure of COVID drug
⇓ Potential decreased exposure of COVID drug
↔ No significant effect

♥ One or both drugs may cause QT and/or PR prolongation. ECG monitoring is advised if coadministered.

Numbers refer to increase or decrease in AUC as observed in drug-drug interaction studies.

Notes:

Clozapine + RBV, CLQ or HCLQ
The risk of haematological toxicity may be potentially increased as clozapine, ribavirin, chloroquine and hydroxychloroquine can cause myelosuppression. Closely monitor haematological parameters.

Clozapine + TCZ
Caution is required due to potential additive haematological toxicity.

Quetiapine + ATV or LPV/r
Coadministration contraindicated in the European product label for quetiapine, however, US product label recommends quetiapine should be reduced to one sixth of the original dose if coadministered with a potent CYP3A4 inhibitor.

Key to abbreviations

ATV	Atazanavir	CLQ	Chloroquine
LPV/r	Lopinavir/ritonavir	HCLQ	Hydroxychloroquine
RDV	Remdesivir	NITAZ	Nitazoxanide
FAVI	Favipiravir	RBV	Ribavirin
		TCZ	Tocilizumab

Colour Legend

These drugs should not be coadministered
Potential interaction which may require a dose adjustment or close monitoring.
Potential interaction likely to be of weak intensity. Additional action/monitoring or dosage adjustment unlikely to be required.
No clinically significant interaction expected

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Antivirals

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Atazanavir		✕	↔	↔	⇑ ♥	⇑ ♥	↔	↔	↔
Lopinavir/ritonavir	✕		↔	↔	⇑ ♥	⇑ ♥	↔	↔	↔
Remdesivir	↔	↔		↔	↔	↔	↔	↔	↔
Favipiravir	↔	↔	↔		↔	↔	↔	↔	↔
Chloroquine	↑ ♥	↑ ♥	↔	↔		✕	↔	↔	↔
Hydroxychloroquine	↑ ♥	↑ ♥	↔	↔	✕		↔	↔	↔
Nitazoxanide	↔	↔	↔	↔	↔	↔		↔	↔
Ribavirin	↔	↔	↔	↔	↔	↔	↔		↔
Tocilizumab	↔	↔	↔	↔	↔	↔	↔	↔	
Oseltamivir	↔	↔	↔	↑ 14%	↔	↔	↔	↔	↔

Text Legend

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↓ Potential decreased exposure of the comedication
⇑ Potential increased exposure of COVID drug
⇓ Potential decreased exposure of COVID drug
↔ No significant effect

♥ One or both drugs may cause QT and/or PR prolongation. ECG monitoring is advised if coadministered.

Numbers refer to increase or decrease in AUC as observed in drug-drug interaction studies.

Notes:

ATV + LPV/r
These drugs are not intended to be combined for the treatment of COVID-19.

CLQ + HCLQ
Chloroquine and hydroxychloroquine should not be coadministered as hydroxychloroquine is a metabolite of chloroquine.

Chloroquine or Hydroxychloroquine + LPV/r
LPV/r may increase concentrations of chloroquine or hydroxychloroquine, but to a moderate extent. Since LPV/r and chloroquine or hydroxychloroquine can cause QT prolongation, ECG monitoring is recommended when coadministering these agents.

Key to abbreviations

ATV	Atazanavir	CLQ	Chloroquine
LPV/r	Lopinavir/ritonavir	HCLQ	Hydroxychloroquine
RDV	Remdesivir	NITAZ	Nitazoxanide
FAVI	Favipiravir	RBV	Ribavirin
		TCZ	Tocilizumab

Colour Legend

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Potential interaction which may require a dose adjustment or close monitoring.
Potential interaction likely to be of weak intensity. Additional action/monitoring or dosage adjustment unlikely to be required.
No clinically significant interaction expected

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Anxiolytics/Hypnotics/Sedatives

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Alprazolam	↑	↑	↔	↔	↔	↔	↔	↔	↔
Bromazepam	↑	↑	↔	↔	↔	↔	↔	↔	↔
Buspirone	↑	↑	↔	↔	↔	↔	↔	↔	↔
Chlordiazepoxide	↑	↑	↔	↔	↔	↔	↔	↔	↔
Clobazam	↑	↑	↔	↔	↔	↔	↔	↔	↔
Clorazepate	↑	↑	↔	↔	↔	↔	↔	↔	↔
Diazepam	↑	↑	↔	↔	↔	↔	↔	↔	↔
Estazolam	↑	↑	↔	↔	↔	↔	↔	↔	↔
Flunitrazepam	↑	↑	↔	↔	↔	↔	↔	↔	↔
Flurazepam	↑	↑	↔	↔	↔	↔	↔	↔	↔
Hydroxyzine	↑ ♥	↑ ♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Lorazepam	↔	↔	↔	↔	↔	↔	↔	↔	↔
Lormetazepam	↔	↔	↔	↔	↔	↔	↔	↔	↔
Midazolam (oral)	↑	↑	↔	↔	↔	↔	↔	↔	↔
Midazolam (parenteral)	↑	↑	↔	↔	↔	↔	↔	↔	↔
Oxazepam	↔	↔	↔	↔	↔	↔	↔	↔	↔
Temazepam	↔	↔	↔	↔	↔	↔	↔	↔	↔
Triazolam	↑	↑	↔	↔	↔	↔	↔	↔	↔
Zaleplon	↑	↑	↔	↔	↔	↔	↔	↔	↔
Zolpidem	↑	↑	↔	↔	↔	↔	↔	↔	↔
Zopiclone	↑	↑	↔	↔	↔	↔	↔	↔	↔

Text Legend

↑ Potential increased exposure of the comedication
↓ Potential decreased exposure of the comedication
⇑ Potential increased exposure of COVID drug
⇓ Potential decreased exposure of COVID drug
↔ No significant effect

♥ One or both drugs may cause QT and/or PR prolongation. ECG monitoring is advised if coadministered.

Numbers refer to increase or decrease in AUC as observed in drug-drug interaction studies.

Key to abbreviations

ATV	Atazanavir	CLQ	Chloroquine
LPV/r	Lopinavir/ritonavir	HCLQ	Hydroxychloroquine
RDV	Remdesivir	NITAZ	Nitazoxanide
FAVI	Favipiravir	RBV	Ribavirin
		TCZ	Tocilizumab

Colour Legend

These drugs should not be coadministered
Potential interaction which may require a dose adjustment or close monitoring.
Potential interaction likely to be of weak intensity. Additional action/monitoring or dosage adjustment unlikely to be required.
No clinically significant interaction expected

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Beta Blockers

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Atenolol	↔♥	↔♥	↔	↔	↔	↔	↔	↔	↔
Bisoprolol	↑♥	↑♥	↔	↔	↔	↔	↔	↔	↔
Carvedilol	↑♥	↑↓♥	↔	↔	↔	↔	↔	↔	↔
Metoprolol	↔ ♥	↑♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Nebivolol	↔ ♥	↑♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Oxprenolol	↑♥	↓♥	↔	↔	↔	↔	↔	↔	↔
Pindolol	↔ ♥	↑♥	↔	↔	↔	↔	↔	↔	↔
Propranolol	↔ ♥	↑♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Timolol	↔ ♥	↑♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔

Text Legend

↑ Potential increased exposure of the comedication
↓ Potential decreased exposure of the comedication
⇑ Potential increased exposure of COVID drug
⇓ Potential decreased exposure of COVID drug
↔ No significant effect

♥ One or both drugs may cause QT and/or PR prolongation. ECG monitoring is advised if coadministered.

Numbers refer to increase or decrease in AUC as observed in drug-drug interaction studies.

Key to abbreviations

ATV	Atazanavir	CLQ	Chloroquine
LPV/r	Lopinavir/ritonavir	HCLQ	Hydroxychloroquine
RDV	Remdesivir	NITAZ	Nitazoxanide
FAVI	Favipiravir	RBV	Ribavirin
		TCZ	Tocilizumab

Colour Legend

These drugs should not be coadministered
Potential interaction which may require a dose adjustment or close monitoring.
Potential interaction likely to be of weak intensity. Additional action/monitoring or dosage adjustment unlikely to be required.
No clinically significant interaction expected

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Bronchodilators

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Aclidinium bromide	↔	↔	↔	↔	↔	↔	↔	↔	↔
Aminophylline	↔	↓	↔	↔	↔	↔	↔	↔	↔
Formoterol	↔♥	↔♥	↔	↔	↔	↔	↔	↔	↔
Glycopyrronium bromide	↔	↔	↔	↔	↔	↔	↔	↔	↔
Indacaterol	↑	↑	↔	↔	↔	↔	↔	↔	↔
Ipratropium bromide	↔	↔	↔	↔	↔	↔	↔	↔	↔
Montelukast	↑	↑	↔	↑	↔	↔	↔	↔	↔
Olodaterol	↑	↑	↔	↔	↔	↔	↔	↔	↔
Roflumilast	↑	↑	↔	↔	↔	↔	↔	↔	↔
Salbutamol	↔	↔	↔	↔	↔	↔	↔	↔	↔
Salmeterol	↑	↑	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Theophylline	↔	↓	↔	⇑17-27%	↔	↔	↔	↔	↓
Tiotropium bromide	↔	↔	↔	↔	↔	↔	↔	↔	↔
Umeclidinium bromide	↑	↑	↔	↔	↑	↑	↔	↔	↔
Vilanterol	↑	↑	↔	↔	↔	↔	↔	↔	↔

Text Legend

↑ Potential increased exposure of the comedication
↓ Potential decreased exposure of the comedication
⇑ Potential increased exposure of COVID drug
⇓ Potential decreased exposure of COVID drug
↔ No significant effect

♥ One or both drugs may cause QT and/or PR prolongation. ECG monitoring is advised if coadministered.

Numbers refer to increase or decrease in AUC as observed in drug-drug interaction studies.

Notes:

Indacaterol + ATV or LPV/r
Exposure can be increased by up to 2-fold with ritonavir (and may be similar with atazanavir), however, this increase does not raise any concerns based on indacaterol's safety data.

Key to abbreviations

ATV	Atazanavir	CLQ	Chloroquine
LPV/r	Lopinavir/ritonavir	HCLQ	Hydroxychloroquine
RDV	Remdesivir	NITAZ	Nitazoxanide
FAVI	Favipiravir	RBV	Ribavirin
		TCZ	Tocilizumab

Colour Legend

These drugs should not be coadministered
Potential interaction which may require a dose adjustment or close monitoring.
Potential interaction likely to be of weak intensity. Additional action/monitoring or dosage adjustment unlikely to be required.
No clinically significant interaction expected

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Calcium Channel Blockers

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Amlodipine	↑♥	↑♥	↔	↔	↔	↔	↔	↔	↔
Diltiazem	↑ 125%♥	↑♥	↔	↔	↔	↔	↔	↔	↔
Felodipine	↑♥	↑♥	↔	↔	↔	↔	↔	↔	↔
Nicardipine	↑♥	↑♥	↔	↔	↔	↔	↔	↔	↔
Nifedipine	↑♥	↑♥	↔	↔	↔	↔	↔	↔	↔
Nisoldipine	↑♥	↑♥	↔	↔	↔	↔	↔	↔	↔
Nitrendipine	↑♥	↑♥	↔	↔	↔	↔	↔	↔	↔
Verapamil	↑♥	↑♥	↔	↔	⇑	⇑	↔	↔	↔

Text Legend

↑ Potential increased exposure of the comedication
↓ Potential decreased exposure of the comedication
⇑ Potential increased exposure of COVID drug
⇓ Potential decreased exposure of COVID drug
↔ No significant effect

♥ One or both drugs may cause QT and/or PR prolongation. ECG monitoring is advised if coadministered.

Numbers refer to increase or decrease in AUC as observed in drug-drug interaction studies.

Notes:

Amlodipine + LPV/r
If coadministration is indicated, consider a dose reduction for amlodipine of 50%.

Diltiazem + ATV
If coadministration is indicated, an initial dose reduction of diltiazem by 50% is recommended, with subsequent titration as needed and ECG monitoring.

Key to abbreviations

ATV	Atazanavir	CLQ	Chloroquine
LPV/r	Lopinavir/ritonavir	HCLQ	Hydroxychloroquine
RDV	Remdesivir	NITAZ	Nitazoxanide
FAVI	Favipiravir	RBV	Ribavirin
		TCZ	Tocilizumab

Colour Legend

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Contraceptives

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Desogestrel (COC)	↑	↑	↔	↑	↔	↔	↔	↔	↔
Desogestrel (POP)	↑	↑	↔	↑	↔	↔	↔	↔	↔
Drospirenone (COC)	↑	↑	↔	↑	↔	↔	↔	↔	↔
Ethinylestradiol	↑ 48%	↓ 42%	↔	↑ 43%	↔	↔	↔	↔	↔
Etonogestrel (implant)	↑	↑ 52%	↔	↑	↔	↔	↔	↔	↔
Etonogestrel (vaginal ring)	↑	↑	↔	↑	↔	↔	↔	↔	↔
Gestodene (COC)	↑	↑	↔	↑	↔	↔	↔	↔	↔
Levonorgestrel (COC)	↑	↑	↔	↑	↔	↔	↔	↔	↔
Levonorgestrel (emergency con.)	↑	↑	↔	↑	↔	↔	↔	↔	↔
Levonorgestrel (implant)	↑	↑	↔	↑	↔	↔	↔	↔	↔
Levonorgestrel (IUD)	↔	↔	↔	↔	↔	↔	↔	↔	↔
Levonorgestrel (POP)	↑	↑	↔	↑	↔	↔	↔	↔	↔
Medroxyprogesterone (depot inj)	↔	↑ 70%	↔	↔	↔	↔	↔	↔	↔
Norelgestromin (patch)	↑	↑ 83%	↔	↑	↔	↔	↔	↔	↔
Norethisterone (COC)	↑ 110%	↓ 17%	↔	↑ 47%	↔	↔	↔	↔	↔
Norethisterone (IM depot)	↔	↔	↔	↑	↔	↔	↔	↔	↔
Norethisterone(POP)	↑	↑	↔	↑	↔	↔	↔	↔	↔
Norgestimate (COC)	↑	↑	↔	↑	↔	↔	↔	↔	↔
Norgestrel (COC)	↑	↑	↔	↑	↔	↔	↔	↔	↔
Ulipristal	↑	↑	↔	↑	↔	↔	↔	↔	↔

Text Legend

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⇑ Potential increased exposure of COVID drug
⇓ Potential decreased exposure of COVID drug
↔ No significant effect

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Numbers refer to increase or decrease in AUC as observed in drug-drug interaction studies.

Notes:

COC – Combined oral contraceptive; POP – Progestogen only pill; IUD – Intra-uterine device

Contraceptives + RBV
Extreme care must be taken to avoid pregnancy in female patients and in female partners of male patients taking ribavirin. The European product labels for ribavirin state that effective contraception must be used during ribavirin treatment and for 4 months after treatment has been concluded in female patients and for 7 months in female partners of male patients. The US product labels for ribavirin state that effective contraception must be used during ribavirin treatment and for 6 months after treatment has been concluded in female patients and female partners of male patients.

Ethinylestradiol and/or progestins + ATV, LPV/r, FAVI
Concentrations of ethinylestradiol and progestins may be affected but no action is needed due to the short treatment duration of the COVID-19 therapy.

Levonorgestrel (emergency contraception) and Ulipristal + ATV or LPV/r
Any increase in exposure of levonorgestrel or ulipristal is unlikely to be clinically significant when used as a single dose.

Key to abbreviations

ATV	Atazanavir	CLQ	Chloroquine
LPV/r	Lopinavir/ritonavir	HCLQ	Hydroxychloroquine
RDV	Remdesivir	NITAZ	Nitazoxanide
FAVI	Favipiravir	RBV	Ribavirin
		TCZ	Tocilizumab

Colour Legend

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Potential interaction which may require a dose adjustment or close monitoring.
Potential interaction likely to be of weak intensity. Additional action/monitoring or dosage adjustment unlikely to be required.
No clinically significant interaction expected

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Gastrointestinal Agents

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Alosetron	↔	↓	↔	↔	↔	↔	↔	↔	↔
Antacids	⇓	↔	↔	↔	⇓	⇓	↔	↔	↔
Bisacodyl	↔	↔	↔	↔	↔	↔	↔	↔	↔
Cimetidine	⇓	↔	↔	↔	↔	↔	↔	↔	↔
Cisapride	↑ ♥	↑ ♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Esomeprazole	⇓	↔	↔	↔	↔	↔	↔	↔	↔
Famotidine	⇓ 41%	↔	↔	↔	↔	↔	↔	↔	↔
Lactulose	↔	↔	↔	↔	↔	↔	↔	↔	↔
Lansoprazole	⇓	↔	↔	↔	↔	↔	↔	↔	↔
Loperamide	↑ ♥	↑ ♥	↔	↔	↔	↔	↔	↔	↔
Mesalazine	↔	↔	↔	↔	↔	↔	↔	↔	↔
Omeprazole	⇓	↔	↔	↔	↔	↔	↔	↔	↔
Pantoprazole	⇓	↔	↔	↔	↔	↔	↔	↔	↔
Prucalopride	↔	↔	↔	↔	↔	↔	↔	↔	↔
Rabeprazole	⇓	↔	↔	↔	↔	↔	↔	↔	↔
Ranitidine	⇓	↔	↔	↔	↔	↔	↔	↔	↔
Senna	↔	↔	↔	↔	↔	↔	↔	↔	↔

Text Legend

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↓ Potential decreased exposure of the comedication
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⇓ Potential decreased exposure of COVID drug
↔ No significant effect

♥ One or both drugs may cause QT and/or PR prolongation. ECG monitoring is advised if coadministered.

Numbers refer to increase or decrease in AUC as observed in drug-drug interaction studies.

Notes:

Antacids + ATV
Antacids can reduce absorption of atazanavir. Atazanavir should be taken at least 2 h before or 1 h after antacids.

Antacids + CLQ
Antacids can reduce absorption of chloroquine. Antacids should be taken at least 2 h before or 2 h after chloroquine.

Antacids +HCLQ
Antacids can reduce absorption of hydroxychloroquine. Antacids should be taken at least 4 h before or 4 h after hydroxychloroquine.

Cimetidine, famotidine, ranitidine + ATV
Unboosted atazanavir is not recommended with H2RAs as they can reduce absorption of atazanavir. If coadministration is necessary, atazanavir 400 mg once daily with food should be administered at least 2 hours before and at least 10 hours after a dose of the H2RA.

Esomeprazole, lansoprazole, omeprazole, pantoprazole, rabeprazole + ATV
When possible, discontinue proton pump inhibitor treatment for the duration of atazanavir treatment.

Loperamide + ATV or LPV/r
Caution is advised with high doses of loperamide used for reducing stoma output, particularly as patients may be at increased risk of cardiac events due to electrolytes disturbances.

Key to abbreviations

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LPV/r	Lopinavir/ritonavir	HCLQ	Hydroxychloroquine
RDV	Remdesivir	NITAZ	Nitazoxanide
FAVI	Favipiravir	RBV	Ribavirin
		TCZ	Tocilizumab

Colour Legend

These drugs should not be coadministered
Potential interaction which may require a dose adjustment or close monitoring.
Potential interaction likely to be of weak intensity. Additional action/monitoring or dosage adjustment unlikely to be required.
No clinically significant interaction expected

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Gastrointestinal Agents – Anti-emetics

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Aprepitant	↑	↑	↔	↔	↔	↔	↔	↔	↔
Dolasetron	↑ ♥	↔ ♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Domperidone	↑ ♥	↑ ♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Dronabinol	↑	↑	↔	↔	↔	↔	↔	↔	↔
Granisetron	↑ ♥	↑ ♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Metoclopramide	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ondansetron	↑ ♥	↑ ♥	↔	↔	↔ ♥	↔ ♥	↔	↔	↔
Prochlorperazine	↔ ♥	↑ ♥	↔	↔	↑♥	↑♥	↔	↔	↔

Text Legend

↑ Potential increased exposure of the comedication
↓ Potential decreased exposure of the comedication
⇑ Potential increased exposure of COVID drug
⇓ Potential decreased exposure of COVID drug
↔ No significant effect

♥ One or both drugs may cause QT and/or PR prolongation. ECG monitoring is advised if coadministered.

Numbers refer to increase or decrease in AUC as observed in drug-drug interaction studies.

Key to abbreviations

ATV	Atazanavir	CLQ	Chloroquine
LPV/r	Lopinavir/ritonavir	HCLQ	Hydroxychloroquine
RDV	Remdesivir	NITAZ	Nitazoxanide
FAVI	Favipiravir	RBV	Ribavirin
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Hormone Replacement Therapy

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Drospirenone (HRT)	↑	↑	↔	↔	↔	↔	↔	↔	↔
Dydrogesterone (HRT)	↑	↑	↔	↑	↔	↔	↔	↔	↔
Estradiol	↑	↓	↔	↑	↔	↔	↔	↔	↔
Levonorgestrel (HRT)	↑	↑	↔	↑	↔	↔	↔	↔	↔
Medroxyprogesterone (oral)	↑	↑	↔	↑	↔	↔	↔	↔	↔
Norethisterone (HRT)	↑	↑	↔	↑	↔	↔	↔	↔	↔
Norgestrel (HRT)	↑	↑	↔	↑	↔	↔	↔	↔	↔

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⇓ Potential decreased exposure of COVID drug
↔ No significant effect

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Numbers refer to increase or decrease in AUC as observed in drug-drug interaction studies.

Notes:

Estradiol and + ATV, LPV/r or FAVI
Concentrations of estradiol may alter but no action is needed due to the short treatment duration of the COVID-19 therapy.

Progestins + ATV, LPV/r or FAVI
Concentrations of progestins may increase but no action is needed due to the short treatment duration of the COVID-19 therapy.

Key to abbreviations

ATV	Atazanavir	CLQ	Chloroquine
LPV/r	Lopinavir/ritonavir	HCLQ	Hydroxychloroquine
RDV	Remdesivir	NITAZ	Nitazoxanide
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		TCZ	Tocilizumab

Colour Legend

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No clinically significant interaction expected

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Immunosuppressants

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Adalimumab	↔	↔	↔	↔	↔	↔	↔	↔	↔
Anti-thymocyte globulin	↔	↔	↔	↔	↔	↔	↔	↔	↔
Azathioprine	↔	↔	↔	↔	↔	↔	↔	↑	↔
Basiliximab	↔	↔	↔	↔	↔	↔	↔	↔	↔
Belatacept	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ciclosporin	↑	↑	↔	↔	↑	↑	↔	↔	↓
Mycophenolate	↔	↑↓	↔	↔	↔	↔	↔	↔	↔
Sirolimus	↑	↑	↔	↔	↑	↑	↔	↔	↓
Tacrolimus	↑	↑	↔	↔	↑	↑	↔	↔	↓

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⇓ Potential decreased exposure of COVID drug
↔ No significant effect

♥ One or both drugs may cause QT and/or PR prolongation. ECG monitoring is advised if coadministered.

Numbers refer to increase or decrease in AUC as observed in drug-drug interaction studies.

Notes:

Adalimumab and azathioprine + CLQ or HCLQ
The risk of haematological toxicity may be potentially increased as adalimumab, azathioprine, chloroquine and hydroxychloroquine can cause myelosuppression. Closely monitor haematological parameters.

Adalimumab + RBV
The risk of haematological toxicity may be potentially increased as adalimumab and ribavirin can cause myelosuppression. Closely monitor haematological parameters.

Adalimumab and basiliximab + TCZ
Avoid coadministration due to the enhanced immunosuppressive effect.

Azathioprine + RBV
Ribavirin may interfere with azathioprine metabolism possibly leading to an accumulation of 6-methylthioinosine monophosphate, which has been associated with myelotoxicity.

Azathioprine + TCZ
Caution is required due to potential additive haematological toxicity.

Key to abbreviations

ATV	Atazanavir	CLQ	Chloroquine
LPV/r	Lopinavir/ritonavir	HCLQ	Hydroxychloroquine
RDV	Remdesivir	NITAZ	Nitazoxanide
FAVI	Favipiravir	RBV	Ribavirin
		TCZ	Tocilizumab

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Potential interaction likely to be of weak intensity. Additional action/monitoring or dosage adjustment unlikely to be required.
No clinically significant interaction expected

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Inotropes & Vasopressors

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Adrenaline (Epinephrine)	↔	↔	↔	↔	↔	↔	↔	↔	↔
Dobutamine	↔	↔	↔	↔	↔	↔	↔	↔	↔
Noradrenaline	↔	↔	↔	↔	↔	↔	↔	↔	↔
Vasopressin	↔	↔	↔	↔	↔	↔	↔	↔	↔

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⇓ Potential decreased exposure of COVID drug
↔ No significant effect

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Numbers refer to increase or decrease in AUC as observed in drug-drug interaction studies.

Notes:

Remdesivir

Pressor requirement to maintain blood pressure is a key exclusion criteria to eligibility for remdesivir use.
See https://rdvcu.gilead.com/ for further details.

Key to abbreviations

ATV	Atazanavir	CLQ	Chloroquine
LPV/r	Lopinavir/ritonavir	HCLQ	Hydroxychloroquine
RDV	Remdesivir	NITAZ	Nitazoxanide
FAVI	Favipiravir	RBV	Ribavirin
		TCZ	Tocilizumab

Colour Legend

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Potential interaction likely to be of weak intensity. Additional action/monitoring or dosage adjustment unlikely to be required.
No clinically significant interaction expected

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Lipid Lowering Agents

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Atorvastatin	↑	↑ 490%	↔	↔	↔	↔	↔	↔	↔
Bezafibrate	↔	↔	↔	↔	↔	↔	↔	↔	↔
Clofibrate	↔	↔	↔	↔	↔	↔	↔	↔	↔
Evolocumab	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ezetimibe	↑	↔	↔	↔	↔	↔	↔	↔	↔
Fenofibrate	↔	↔	↔	↔	↔	↔	↔	↔	↔
Fish oils	↔	↔	↔	↔	↔	↔	↔	↔	↔
Fluvastatin	↑	↔	↔	↔	↔	↔	↔	↔	↔
Gemfibrozil	↔	↓ 41%	↔	↔	↔	↔	↔	↔	↔
Lovastatin	↑	↑	↔	↔	↔	↔	↔	↔	↔
Pitavastatin	↑ 31%	↓ 20%	↔	↔	↔	↔	↔	↔	↔
Pravastatin	↑	↑ 33%	↔	↔	↔	↔	↔	↔	↔
Rosuvastatin	↑	↑ 108%	↔	↔	↔	↔	↔	↔	↔
Simvastatin	↑	↑	↔	↔	↔	↔	↔	↔	↔

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Numbers refer to increase or decrease in AUC as observed in drug-drug interaction studies.

Notes:

Atorvastatin + ATV
Coadministration is not recommended. If the use of atorvastatin is considered necessary, use the lowest possible dose of atorvastatin with careful safety monitoring. The daily atorvastatin dose should not exceed 10 mg.

Atorvastatin + LPV/r
Do not exceed a daily dose of 20 mg with careful safety monitoring.

Evolocumab + TCZ
Avoid coadministration due to the enhanced immunosuppressive effect.

Rosuvastatin + ATV or LPV/r
Do not exceed rosuvastatin 10 mg/day.

Key to abbreviations

ATV	Atazanavir	CLQ	Chloroquine
LPV/r	Lopinavir/ritonavir	HCLQ	Hydroxychloroquine
RDV	Remdesivir	NITAZ	Nitazoxanide
FAVI	Favipiravir	RBV	Ribavirin
		TCZ	Tocilizumab

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Potential interaction which may require a dose adjustment or close monitoring.
Potential interaction likely to be of weak intensity. Additional action/monitoring or dosage adjustment unlikely to be required.
No clinically significant interaction expected

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Steroids

	ATV	LPV/r	RDV	FAVI	CLQ	HCLQ	NITAZ	RBV	TCZ
Beclometasone	↔	↑	↔	↔	↔	↔	↔	↔	↔
Betamethasone	↑* ⇓	↑* ⇓	⇓	↔	↔	↔	↔	↔	↔
Budesonide	↑*	↑*	↔	↔	↔	↔	↔	↔	↔
Ciclesonide	↑	↑	↔	↔	↔	↔	↔	↔	↔
Clobetasol	↑*	↑*	↔	↔	↔	↔	↔	↔	↔
Dexamethasone	↑* ⇓	↑* ⇓	⇓	↔	↔	↔	↔	↔	↔
Fludrocortisone	↑*	↑*	↔	↔	↔	↔	↔	↔	↔
Flunisolide	↑	↑	↔	↔	↔	↔	↔	↔	↔
Fluocinolone	↑*	↑*	↔	↔	↔	↔	↔	↔	↔
Fluticasone	↑*	↑*	↔	↔	↔	↔	↔	↔	↔
Hydrocortisone (oral)	↑*	↑*	↔	↔	↔	↔	↔	↔	↔
Hydrocortisone (topical)	↔	↔	↔	↔	↔	↔	↔	↔	↔
Megestrol acetate	↔	↔	↔	↔	↔	↔	↔	↔	↔
Methylprednisolone	↑*	↑*	↔	↔	↔	↔	↔	↔	↔
Mometasone	↑*	↑*	↔	↔	↔	↔	↔	↔	↔
Nandrolone	↔	↔	↔	↔	↔	↔	↔	↔	↔
Oxandrolone	↔	↔	↔	↔	↔	↔	↔	↔	↔
Prednisolone	↑*	↑*	↔	↔	↔	↔	↔	↔	↔
Prednisone	↑*	↑*	↔	↔	↔	↔	↔	↔	↔
Stanazolol	↑	↑	↔	↔	↔	↔	↔	↔	↔
Testosterone	↑	↑	↔	↔	↔	↔	↔	↔	↔
Triamcinolone	↑*	↑*	↔	↔	↔	↔	↔	↔	↔

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Notes:

* Risk of elevated corticosteroid levels, Cushing's syndrome and adrenal suppression.
This risk is present for oral and injected administration, and also for topical, inhaled or eye drops corticosteroids

Beclometasone + LPV/r
Ritonavir (100 mg twice daily) increased the AUC of the active metabolite by 108% but no significant effect on adrenal function was seen. Caution is still warranted, use the lowest possible corticosteroid dose and monitor for corticosteroid side effects.

Betamethasone or Dexamethasone + ATV, LPV/r or RDV
Betamethasone and dexamethasone are moderate inducers of CYP3A4 and could decrease exposure and efficacy of ATV, LPV/r or RDV particularly when administered orally or intravenously at high doses or for a long duration.

Ciclesonide + ATV or LPV/r
No dose adjustment required but monitor closely, especially for Cushing's syndrome, when using a high dose or prolonged administration.

Flunisolide + ATV or LPV/r
Use the lowest possible flunisolide dose with monitoring for corticosteroid side effects.

Prednisolone or Prednisone + LPV/r
Based on DDI study with LPV/r, exposure of prednisolone (obtained also after conversion from prednisone) is increased modestly (+30%). A 30% dose reduction of the corticosteroid might be considered during concomitant treatment.

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