

Antiretroviral Formulations for Swallowing Difficulties

Revised March 2022.

Page 1 of 5

For personal use only. Not for distribution. For personal use only. Not for distribution. For personal use only. Not for distribution.

ARVs	Trade Names	Tablets/Capsules	Oral Solution or Powder or Other
Abacavir	Ziagen	Tablets can be crushed and added to a small amount of semi-solid food or liquid and taken immediately.	Oral Solution <ul style="list-style-type: none"> Dosing is the same for oral solution and tablets.
Abacavir + Lamivudine	Kivexa Epzicom	Tablets should not be crushed as separate abacavir and lamivudine solutions are available. [EACS Guidelines, version 11, 2021]	Oral Solution <ul style="list-style-type: none"> Separate abacavir and lamivudine solutions are available.
Abacavir + Lamivudine + Zidovudine	Trizivir	Tablets should not be crushed as abacavir, lamivudine and zidovudine solutions are available. [EACS Guidelines, version 11, 2021]	Oral Solution <ul style="list-style-type: none"> Separate abacavir, lamivudine and zidovudine solutions are available.
Atazanavir	Reyataz	Capsules should be swallowed whole. Do not open the capsules.	Oral Powder <ul style="list-style-type: none"> It is preferable to mix with food such as apple sauce or yogurt, however, it can be mixed with milk, infant formula, or water for infants who can drink from a cup, or mixed with infant formula and given using an oral dosing syringe to young infants (<6 months) who cannot eat solid food or drink from a cup. Using an infant bottle is not recommended as the full dose may not be delivered.
Atazanavir + Cobicistat	Evotaz	Tablets should be swallowed whole and must not be chewed, broken, cut or crushed.	
Bictegravir + Emtricitabine + Tenofovir alafenamide	Biktarvy	The European product label states tablets should be swallowed whole and should not be chewed, crushed or split. The American product label advises if unable to swallow a whole tablet, the tablet can be split and each part taken separately as long as all parts are ingested within approximately 10 minutes. A clinical study showed that dissolving a tablet in water resulted in a modest increase in bictegravir bioavailability and a modest decrease in tenofovir bioavailability. Crushing the tablet and administering with apple sauce resulted in reduced emtricitabine and tenofovir bioavailability. If a tablet cannot be swallowed whole, it is recommended to dissolve it in water and take it immediately; crushing is not recommended. [Hocqueloux L, et al, EACS 2021, abstract PE2/76]	
Cabotegravir	Vocabria	Tablets must be swallowed whole. [EACS Guidelines, version 11, 2021]	
Cabotegravir + Rilpivirine (Long Acting)	Vocabria + Rekambys; Cabenuva	Not applicable	Prolonged Release Suspensions <ul style="list-style-type: none"> For IM injection
Cobicistat	Tybost	Tablets should not be chewed or crushed.	
Darunavir	Prezista	Tablets can be crushed and added to a small amount of semi-solid food or liquid and taken immediately. [EACS Guidelines, version 11, 2021]	Oral Solution <ul style="list-style-type: none"> Dosing is the same for oral suspension and tablets.
Darunavir + Cobicistat	Prezcobix Rezolsta	The European product label advises that tablets may be split into two pieces using a tablet-cutter, and the entire dose should be consumed immediately after splitting. Based on data with a fixed-dose tablet containing DRV/c/FTC/TAF (Symtuza), crushing tablets does not impact significantly DRV/c pharmacokinetics. [Brown K, et al, Clin Pharmacol Drug Dev. 2019; 8(4):541-548.]	

All information refers to licensed use of products and is sourced from individual manufacturers' UK Summary of Product Characteristics and US Prescribing Information unless otherwise stated. Not all formulations may be available in all regions; additional formulations may be available in some regions. Refer to the product label for full dosing, preparation and storage information.

© Liverpool Drug Interactions Group, University of Liverpool, Pharmacology Research Labs, 1st Floor Block H, 70 Pembroke Place, LIVERPOOL, L69 3GF.

We aim to ensure that information is accurate and consistent with current knowledge and practice. However, the University of Liverpool and its servants or agents shall not be responsible or in any way liable for the continued currency of information in this publication whether arising from negligence or otherwise howsoever or for any consequences arising therefrom. The University of Liverpool expressly exclude liability for errors, omissions or inaccuracies to the fullest extent permitted by law.

Antiretroviral Formulations for Swallowing Difficulties

Revised March 2022.

Page 2 of 5

For personal use only. Not for distribution. For personal use only. Not for distribution. For personal use only. Not for distribution.

ARVs	Trade Names	Tablets/Capsules	Oral Solution or Powder or Other
Darunavir + Cobicistat + Emtricitabine + Tenofovir alafenamide	Symtuza	Product labels advise that Symtuza tablets may be split into two pieces using a tablet-cutter, and the entire dose should be consumed immediately after splitting. Crushing Symtuza tablets had no significant effect on darunavir, cobicistat or emtricitabine. TAF AUC reduced by 19% but this is unlikely to be clinically significant. [Brown K, et al, Clin Pharmacol Drug Dev. 2019; 8(4):541-548.]	
Dolutegravir	Tivicay	Tablets can be split or crushed and added to a small amount of semi-solid food or liquid and taken immediately. [EACS Guidelines, version 11, 2021]	Dispersible Tablets <ul style="list-style-type: none"> The bioavailability of dispersible tablets and film-coated tablets is not comparable and they are not interchangeable on a milligram per milligram basis. For example, the recommended adult dose for dispersible tablets is 30 mg versus 50 mg for film-coated tablets.
Dolutegravir + Abacavir + Lamivudine	Triumeq	Tablets can be split or crushed and added to a small amount of semi-solid food or liquid and taken immediately. [EACS Guidelines, version 11, 2021] Administration of crushed tablets suspended in water increased dolutegravir AUC by 26%, but had no significant effect on abacavir or lamivudine. Administration of crushed tablets with enteral nutrition decreased abacavir Cmax by 17%, but had no significant effect on dolutegravir or lamivudine. [Roskam-Kwint M, et al, J Antimicrob Chemother, 2018, 73(9):2430-2434.]	
Dolutegravir + Lamivudine	Dovato	No data are available with Dovato tablets but effects may be similar to those observed with Triumeq tablets. Dolutegravir AUC increased by 26% and there was no significant effect on lamivudine when crushed Triumeq tablets (dolutegravir, abacavir, lamivudine) were suspended in water and administered. Administration of crushed Triumeq tablets with enteral nutrition had no significant effect on dolutegravir or lamivudine. [Roskam-Kwint M, et al, J Antimicrob Chemother, 2018, 73(9):2430-2434.]	
Dolutegravir + Ralpivirine	Juluca	Tablets should be swallowed whole and should not be chewed or crushed.	
Doravirine	Pifeltro	Tablets must be swallowed whole.	
Doravirine + Lamivudine + Tenofovir-DF	Delstrigo	Tablets must be swallowed whole.	
Efavirenz	Sustiva Stocrin	Tablets may be divided for ease of swallowing. [EACS Guidelines, version 11, 2021] Capsules can be opened and the contents administered with a small amount of food using the capsule sprinkle method of administration.	Oral Solution <ul style="list-style-type: none"> Oral solution and tablets/capsules are NOT bioequivalent.
Efavirenz + Emtricitabine + Tenofovir-DF	Atripla	Tablets should be swallowed whole with water.	

All information refers to licensed use of products and is sourced from individual manufacturers' UK Summary of Product Characteristics and US Prescribing Information unless otherwise stated. Not all formulations may be available in all regions; additional formulations may be available in some regions. Refer to the product label for full dosing, preparation and storage information.

© Liverpool Drug Interactions Group, University of Liverpool, Pharmacology Research Labs, 1st Floor Block H, 70 Pembroke Place, LIVERPOOL, L69 3GF.

We aim to ensure that information is accurate and consistent with current knowledge and practice. However, the University of Liverpool and its servants or agents shall not be responsible or in any way liable for the continued currency of information in this publication whether arising from negligence or otherwise howsoever or for any consequences arising therefrom. The University of Liverpool expressly exclude liability for errors, omissions or inaccuracies to the fullest extent permitted by law.

Antiretroviral Formulations for Swallowing Difficulties

Revised March 2022.

Page 3 of 5

For personal use only. Not for distribution. For personal use only. Not for distribution. For personal use only. Not for distribution.

ARVs	Trade Names	Tablets/Capsules	Oral Solution or Powder or Other
Elvitegravir + Cobicistat + Emtricitabine + Tenofovir alafenamide	Genvoya	<p>Tablets may be split in half and both halves taken one after the other, ensuring that the full dose is taken immediately.</p> <p>Alternatively, tablets can be dissolved in water (one tablet in 120 ml water) and consumed immediately.</p> <p>Dissolving tablets in water decreased elvitegravir concentrations by 11%, but this is not clinically significant; no decrease in emtricitabine or tenofovir alafenamide concentrations was observed [<i>Hendrix CW, et al, CROI 2022, abstract 447</i>].</p> <p>Based on data with fixed-dose combination tablets (EVG/c/FTC/TDF or DRV/c/FTC/TAF), crushing tablets has no significant effect on EVG/c [<i>Jongbloed-de Hoon M, et al. J Acquir Immune Defic Syndr. 2017, 74(5):571-574</i>] and did not significantly alter FTC/TAF pharmacokinetics [<i>Brown K, et al, Clin Pharmacol Drug Dev. 2019; 8(4):541-548.</i>] (tenofovir bioavailability reduced by 20% (crushing) but this is unlikely to be clinically significant).</p>	
Elvitegravir + Cobicistat + Emtricitabine + Tenofovir-DF	Stribild	<p>Tablets should not be chewed or crushed.</p> <p>Crushing tablets is not recommended in the product label, however, there was no significant effect on the pharmacokinetics of the components of the tablet following oral administration of a crushed and suspended tablet. [<i>Jongbloed-de Hoon M, et al. J Acquir Immune Defic Syndr. 2017, 74(5):571-574.</i>]</p>	
Emtricitabine	Emtriva	<p>Capsules can be opened and contents dissolved in at least 30 ml water.</p> <p>[<i>EACS Guidelines, version 11, 2021</i>]</p>	<p>Powder for Oral Solution</p> <ul style="list-style-type: none"> • Oral solution and capsules are NOT bioequivalent. • Contains Na⁺ 460 µmol/ml.
Emtricitabine + Tenofovir alafenamide	Descovy	<p>Due to the bitter taste, tablets should not be chewed or crushed.</p> <p>Tablets may be split in half and both halves taken one after the other, ensuring that the full dose is taken immediately.</p> <p>Crushing of tablets is not recommended in the product information. However, based on data with a fixed-dose combination tablet containing DRV/c/TAF/FTC (Symtuza), crushing of tablets did not significantly alter FTC/TAF pharmacokinetics (tenofovir bioavailability reduced by 20% (crushing) but this is unlikely to be clinically significant).</p> <p>[<i>Brown K, et al, Clin Pharmacol Drug Dev. 2019; 8(4):541-548.</i>]</p>	
Emtricitabine + Tenofovir-DF	Truvada	<p>Tablets may be disintegrated in at least 100 ml of water, orange juice, or grape juice and taken immediately.</p>	
Etravirine	Intencele	<p>Tablets may be dispersed in 5 ml of water, or at least enough liquid to cover, and stir well. If desired, add more water or alternatively orange juice or milk (do not place the tablets in orange juice or milk without first adding water). Drink immediately and rinse the glass several times to ensure the entire dose is taken.</p>	
Fosamprenavir	Telzir Lexiva	(Not mentioned in product label)	<p>Oral Suspension</p> <ul style="list-style-type: none"> • Bioequivalence was not demonstrated when oral suspension was given with food. • Adults should take the oral suspension on an empty stomach; patients under 18 years should take the oral suspension with food.

All information refers to licensed use of products and is sourced from individual manufacturers' UK Summary of Product Characteristics and US Prescribing Information unless otherwise stated. Not all formulations may be available in all regions; additional formulations may be available in some regions. Refer to the product label for full dosing, preparation and storage information.

© Liverpool Drug Interactions Group, University of Liverpool, Pharmacology Research Labs, 1st Floor Block H, 70 Pembroke Place, LIVERPOOL, L69 3GF.

We aim to ensure that information is accurate and consistent with current knowledge and practice. However, the University of Liverpool and its servants or agents shall not be responsible or in any way liable for the continued currency of information in this publication whether arising from negligence or otherwise howsoever or for any consequences arising therefrom. The University of Liverpool expressly exclude liability for errors, omissions or inaccuracies to the fullest extent permitted by law.

Antiretroviral Formulations for Swallowing Difficulties

Revised March 2022.

Page 4 of 5

For personal use only. Not for distribution. For personal use only. Not for distribution. For personal use only. Not for distribution.

ARVs	Trade Names	Tablets/Capsules	Oral Solution or Powder or Other
Fostemsavir	Rukobia	The prolonged-release tablet should be swallowed whole with water, and not chewed, crushed or split.	
Ibalizumab-uiyk	Trogarzo	Not applicable	IV concentrate <ul style="list-style-type: none"> For dilution and infusion
Indinavir	Crixivan	Capsules should be swallowed whole.	
Lamivudine	Epivir	Tablets can be crushed and added to a small amount of semi-solid food or liquid and taken immediately.	Oral Solution <ul style="list-style-type: none"> Dosing is the same for oral solution and tablets. Contains 1g/5ml sucrose. Sorbitol significantly reduces the bioavailability of lamivudine solution in a dose dependent manner. [Adkison KK, et al, Clin Pharmacol Ther. 2018; 103(3):402-408.]
Lamivudine + Zidovudine	Combivir	Tablets may be crushed and mixed with a small amount of semi-solid food or liquid which must be consumed immediately.	Oral Solution <ul style="list-style-type: none"> Separate lamivudine and zidovudine solutions are available.
Lopinavir	Kaletra	Tablets must be swallowed whole and not chewed, broken or crushed.	Oral Solution <ul style="list-style-type: none"> Dosing is the same for oral solution and tablets. Contains 153 mg/ml propylene glycol and alcohol (42%). Not recommended for use with polyurethane feeding tubes due to potential incompatibility. Feeding tubes that are compatible with ethanol and propylene glycol, such as silicone and polyvinyl chloride (PVC) feeding tubes, can be used.
Maraviroc	Celsentri Selzentry	No specific pharmacokinetic data on file. Crushing the tablet is not expected to have a negative effect on bioavailability. [EACS Guidelines, version 11, 2021]	Oral Solution <ul style="list-style-type: none"> Dosing is the same for oral solution and tablets.
Nevirapine	Viramune Viramune XR	Tablets can be crushed and dissolved in water but any extended release effect will be lost. If the extended release effect is lost, twice daily administration is recommended in patients with higher body weight (≥ 90 kg) as sub-therapeutic trough levels may occur following administration of nevirapine 400 mg once daily immediate release. [EACS Guidelines, version 11, 2021]	Oral Suspension <ul style="list-style-type: none"> Viramune tablets and oral suspension are comparably bioavailable and interchangeable at doses up to 200 mg. Contains 150 mg/ml sucrose and 162 mg/ml sorbitol.
Raltegravir	Isentress	Film coated tablets should not be chewed, crushed or split due to anticipated changes in the pharmacokinetic profile. Crushing tablets is not recommended in the product information, however absorption of raltegravir was not compromised when the drug was crushed, dissolved in 60 mL warm water and administered by gastrostomy tube. [Sandkovsky U, et al. Pharmacotherapy, 2012, 32(2):142-7.]	Granules for Oral Suspension <ul style="list-style-type: none"> Isentress for oral suspension is NOT bioequivalent with Isentress film coated tablets. Each single-use sachet contains 100 mg of raltegravir which is to be suspended in 10 mL of water giving a final concentration of 10 mg/mL. Each sachet contains approximately 0.5 mg fructose, 1.5 mg sorbitol, 4.7 mg sucrose. Chewable tablets <ul style="list-style-type: none"> Isentress chewable tablets are NOT bioequivalent with Isentress film coated tablets. May be chewed or swallowed whole. Maximum dose is 300 mg twice daily.

All information refers to licensed use of products and is sourced from individual manufacturers' UK Summary of Product Characteristics and US Prescribing Information unless otherwise stated. Not all formulations may be available in all regions; additional formulations may be available in some regions. Refer to the product label for full dosing, preparation and storage information.

© Liverpool Drug Interactions Group, University of Liverpool, Pharmacology Research Labs, 1st Floor Block H, 70 Pembroke Place, LIVERPOOL, L69 3GF.

We aim to ensure that information is accurate and consistent with current knowledge and practice. However, the University of Liverpool and its servants or agents shall not be responsible or in any way liable for the continued currency of information in this publication whether arising from negligence or otherwise howsoever or for any consequences arising therefrom. The University of Liverpool expressly exclude liability for errors, omissions or inaccuracies to the fullest extent permitted by law.

Antiretroviral Formulations for Swallowing Difficulties

Revised March 2022.

Page 5 of 5

For personal use only. Not for distribution. For personal use only. Not for distribution. For personal use only. Not for distribution.

Rilpivirine	Edurant	Tablets should be swallowed whole with water and not be chewed or crushed. Rilpivirine is insoluble in water over a wide pH range.	
Rilpivirine + Emtricitabine + Tenofovir alafenamide	Odefsey	Tablets should not be chewed, crushed or split due to the bitter taste.	
Rilpivirine + Emtricitabine + Tenofovir-DF	Complera Eviplera	Tablets should not be chewed, crushed or split as it may impact absorption.	
Ritonavir	Norvir	Tablets should be swallowed whole and not chewed, broken or crushed.	<p>Oral Solution</p> <ul style="list-style-type: none"> Dosing is the same for oral solution and tablets. Bitter taste can be masked by mixing with chocolate milk. Must NOT be mixed with water and the measuring cup must be dry. Contains alcohol (~43%) and propylene glycol (~27%). Not recommended for use with polyurethane feeding tubes due to potential incompatibility. Feeding tubes that are compatible with ethanol and propylene glycol, such as silicone and polyvinyl chloride (PVC) feeding tubes, can be used. <p>Powder for Oral Suspension</p> <ul style="list-style-type: none"> Can be mixed with food or liquid. The entire contents of a sachet can be poured over a small amount of soft food or suspended in 9.4 ml of liquid (water, chocolate milk, or infant formula) giving a final concentration of 10 mg/ml. Can be administered via a feeding tube after being mixed with water.
Tenofovir-DF	Viread	Tablets may be disintegrated in at least 100 ml of water, orange juice, or grape juice if granules/powder not available.	<p>Granules/Powder</p> <ul style="list-style-type: none"> Viread granules should be mixed in a container with soft food not requiring chewing, for example yoghurt, applesauce or baby food. One tablespoon (15 ml) of soft food per one level scoop of granules is required. The entire mixture should be ingested immediately. Viread granules/powder must not be mixed with liquids.
Tipranavir	Aptivus	Capsules must be swallowed whole and must not be opened or chewed.	<p>Oral Solution</p> <ul style="list-style-type: none"> Dosing is the same for oral solution and capsules. Contains 78 mg/ml (116 IU/mL) of vitamin E.
Zidovudine	Retrovir	Capsules should not be opened due to the bitter taste. Zidovudine solution is available. [EACS Guidelines, version 11, 2021]	<p>Oral Solution</p> <ul style="list-style-type: none"> Dosing is the same for oral solution and capsules. <p>IV concentrate</p> <ul style="list-style-type: none"> For dilution and infusion

All information refers to licensed use of products and is sourced from individual manufacturers' UK Summary of Product Characteristics and US Prescribing Information unless otherwise stated. Not all formulations may be available in all regions; additional formulations may be available in some regions. Refer to the product label for full dosing, preparation and storage information.

© Liverpool Drug Interactions Group, University of Liverpool, Pharmacology Research Labs, 1st Floor Block H, 70 Pembroke Place, LIVERPOOL, L69 3GF.

We aim to ensure that information is accurate and consistent with current knowledge and practice. However, the University of Liverpool and its servants or agents shall not be responsible or in any way liable for the continued currency of information in this publication whether arising from negligence or otherwise howsoever or for any consequences arising therefrom. The University of Liverpool expressly exclude liability for errors, omissions or inaccuracies to the fullest extent permitted by law.