



COMBINATION MEDICATIONS

WHAT ARE COMBINATION MEDICATIONS?

Combination medications are pills or tablets that contain more than one medication to fight HIV. They are listed in the tables below. Pharmaceutical companies have been working hard to make their medications easier to take. Part of this effort has been to combine more than one medication in a single pill. These combinations are referred to as fixed-dose combinations, or FDCs.

The first FDC to treat HIV was Combivir by GlaxoSmithKline. Combivir contains two nucleoside analog reverse transcriptase inhibitors. This was followed by Trizivir, also by GlaxoSmithKline, which includes 3 nukes. Some antiviral products are only available outside the US through the US President's Emergency Plan for AIDS Relief (PEPFAR.) For more information, see fact sheet 475 or <http://www.pepfar.gov>.

Be sure that you do not take a combination medication along with any of its components! For example, do not take Truvada with tenofovir (Viread) or emtricitabine (Emtriva); do not take Combivir along with zidovudine (Retrovir) or lamivudine (Epivir.)

WHAT ARE PK BOOSTERS?

When some medications are taken by mouth, their levels in the blood are very low. For them to fight HIV, they have to be taken at high doses. Another possibility is to "boost" their blood levels. This is done by slowing down the processing (metabolism) of these drugs. A drug that slows down the metabolism is called a "PK booster." PK stands for pharmacokinetic. This refers to the way that medications are processed by the body.

The first PK booster used in HIV was ritonavir by Abbott. Ritonavir slows down the metabolism of many drugs by the liver. This increases the blood levels of some anti-HIV medications so that a lower dose can be taken. However, it can also increase blood levels of many other drugs. In some cases, this can cause a harmful overdose.

A second PK booster by Gilead Sciences, GS-9350, is in Phase II trials. Other PK boosters in Phase I trials include PF-03716539 by Pfizer, SPI-452 by Sequoia, and TMC558445 by Tibotec Pharmaceuticals.

1. Combinations of Reverse Transcriptase Inhibitors ("Nukes").

Year approved*	Generic Name	Trade Name	Also known as:	Manufacturer
1997	Zidovudine/lamivudine	Combivir	AZT or ZDV & 3TC	GlaxoSmithKline & generic
2000	Zidovudine/lamivudine/abacavir	Trizivir	AZT or ZDV, 3TC, Abacavir	GlaxoSmithKline & generic
2004	Abacavir/lamivudine	Epzicom	Ziagen and 3TC	GlaxoSmithKline & generic
2004	Emtricitabine/tenofovir	Truvada	Emtriva and Viread	Gilead Sciences & generic
At present, the following combinations are only available outside the US due to patent protections for the original developers				
2007	Lamivudine/stavudine		3TC, d4T	Generic
2008	Lamivudine/tenofovir		3TC, TDF	Generic

2. Combinations of a Non-Nucleoside Reverse Transcriptase Inhibitor and Reverse Transcriptase Inhibitors

2006	Efavirenz/emtricitabine/tenofovir	Atripla	Sustiva, Emtriva and Viread	Bristol-Myers Squibb and Gilead
At present, the following combinations are only available outside the US due to patent protections for the original developers				
2005	Nevirapine/zidovudine/lamivudine	Duovir	NVP/AZT/3TC	Generic
2006	Efavirenz/zidovudine/lamivudine		EFV/AZT/3TC	Generic
2006	Nevirapine/lamivudine/stavudine	Triomune	NVP/3TC/d4T	Generic
2006	Efavirenz/lamivudine/stavudine		EFV/3TC,d4T	Generic

3. Combinations of Protease Inhibitors (NOTE: a small dose of ritonavir is used to boost blood levels of other protease inhibitors. The amount of ritonavir is not high enough to fight HIV.)

2000	Lopinavir/ritonavir	Kaletra, Aluvia	LPV	Abbott & generic
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4. Other Combinations in Development

In development	Gilead Sciences is studying a combination of elvitegravir (integrase inhibitor); emtricitabine and tenofovir (nukes) with GS9350, a PK booster. This "quad" pill would be a full anti-HIV medication regimen in just one pill per day.			
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*Year of approval of the first version of the combination. More information on medications approved as part of the US President's Emergency Plan for AIDS Relief is available at <http://www.fda.gov/oa/pepfar.htm>

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