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*New Intro to ART; Reports from IDWeek 2019*

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## EDITORIAL

### **This edition of HTB leads with reports from IDWeek 2019, thanks to the US activist organisation natap.org.**

We also include news that the Global Fund replenishment round raised US\$14 billion, with the UK contributing £1.1 billion.

Controversially, the US FDA have approved F/TAF as the second oral option for PrEP, but with a limited indication due to the exclusion of cisgender women in the phase 3 study.

Finally, Richard Jefferys reports on newly-retracted research from the journal Nature Medicine – in this case over a report that the CCR5-Δ32 mutation is associated with an increased rate of all-cause mortality.

As a supplement we include the newly revised Introduction to ART. This printed guide (also online) is free to UK clinics. Please bin (or recycle) any copies from 2018 and reorder the new edition to keep your patients up-to-date.

## SUPPLEMENTS

### **Introduction to ART - October 2019**

**This widely used guide to HIV treatment (ART) has been updated. It is available as a printed A5 booklet that is also available online.**

Main changes to the 2018 edition are to update the choice of drugs, to include the most current treatment guidelines and add new information about recently approved drugs. So both the text and drug chart (the pull-out centre pages or separate PDF) includes bictegravir, Biktarvy, doravirine, Delstrigo, Dovato and ibalizumab.

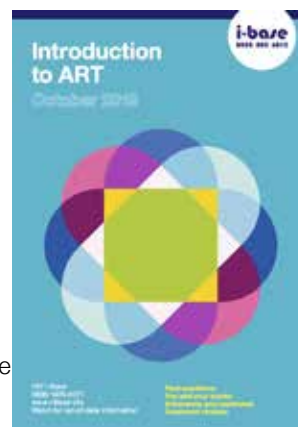
This is the 24th edition of this guide. i-Base set out to make information clear, easy to understand and direct. We update this guide every 12 to 18 months because treatment and the way it is used still changes - though not as quickly as for early editions.

UK guidelines have for many years recommended that treatment should be reviewed annually and we think that information for people living with HIV should match this too.

Also, all i-Base resources (booklets, leaflets, U=U posters and cards, questions to the information service and UK-CAB membership) remain free to UK clinics. This follows the model of NHS care based on universal healthcare as a right.

i-Base guides aim to help you understand your treatment choices, to encourage you to ask questions, and to have better health and better quality of life.

Thanks as always to the advisory group that have added comments each year, making this a collaboration between treatment advocates (many of who are living with HIV) and health workers.



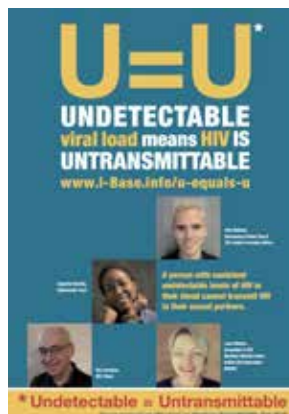
### **U=U resources for UK clinics: free posters, postcards and factsheets**

Please continue to order these free resources.

#### **Customise U=U posters for your clinic**

i-Base can customise U=U posters to include pictures of your doctors, nurses, pharmacists, peer advocates or any other staff that would like to help publicise U=U.

For further information please contact Roy Trelvelon at i-Base: roy.trelvelon@i-base.org.uk



## i-Base 2019 appeal

This year we are continuing a funding appeal to help i-Base continue to provide free publications and services.

Your help has been inspiring – and we hope this support will continue during 2019. If 1000 people support us with £5 a month we will be on course to meet our funding shortfall. All help is appreciated.

<http://i-base.info/i-base-appeal-we-need-your-help>

### Subscriptions

To join the email list for HTB please register free online:

<http://i-base.info/htb/about/subscribe>

## CONFERENCE REPORTS

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### IDWeek (2019)

2–6 October 2019, Washington DC

**This year the annual Infectious Diseases conference (IDWeek 2019) was held in Washington DC.**



Although i-Base wasn't able to attend this meeting, some of the studies reported by the US activist website natap.org will be of interest to UK readers.

It is likely that some of these studies might also be presented at the European AIDS Conference that is being held in Basel next month that i-Base will report from.

Unfortunately IDWeek doesn't publish much of the conference online as an open access resource. NATAP however has many presentations available with approximately 70 studies either reported as slides or in reports by Mark Mascolini.

<http://natap.org/2019/IDWeek/IDWeek.htm>

Articles in the issue of HTB include a selection of the 30 summary reports:

- HIV suppression and safety with ibalizumab at 48 weeks in expanded access
- Oral cabotegravir and rilpivirine is durable for 5.5 years in LATTE study
- Dolutegravir plus rilpivirine had good virologic, safety record in clinics before single tablet available
- Switching from TDF to TAF tied to higher BMI and cardio risk
- Possible higher diabetes risk with INSTIs or PIs than NNRTIs
- Fostemsavir interaction study flags strong CYP3A inducers, statins, oral contraceptives
- Over half of mostly black US HIV group has NAFLD – and many have NASH
- People taking more medications and women have higher fall risk in older HIV group
- No link between raltegravir and adverse birth outcomes in analysis in 2550 women
- PrEP linked to lower HIV incidence in US, independent of TasP

## HIV suppression and safety with ibalizumab at 48 weeks in expanded access

Mark Mascolini, natap.org

**Nearly half of ibalizumab expanded access programme participants who received the monoclonal antibody for 48 weeks reached and maintained an undetectable viral load, despite multidrug resistance when starting ibalizumab. [1]**



Response rates would have been higher if the analysis included seven people who left the programme to take commercially available ibalizumab. At the 24-week point, four of 24 people left the study because of adverse events and three because of virologic failure.

Ibalizumab (Trogarzo) is the first humanised monoclonal antibody licensed for treatment of multidrug-resistant HIV in combination with other antiretrovirals. The agent blocks HIV from binding to cellular CCR5 or CXCR4 coreceptors after it binds to CD4 on the cell surface. [2]

At week 25 of a phase 3 trial, 43% of participants reached a viral load below 50 copies/mL and 50% below 200 copies/mL. [3]

The IDWeek report involves highly pretreated people enrolled in the TMB-311 ibalizumab expanded-access programme. [1]

Everyone had a viral load above 1000 copies/mL, documented resistance to at least one antiretroviral in three classes, and full sensitivity to at least one antiretroviral that could anchor an optimised background regimen given with ibalizumab. No expanded-access participants had taken ibalizumab before.

Participants received a 2000 mg intravenous loading dose of ibalizumab and started the daily optimised background regimen at the same time. Fourteen days later, people started receiving 800 mg of ibalizumab every two weeks as the daily background regimen continued.

The 38 expanded access participants averaged 50 years in age, 87% were men, and 47% were nonwhite. The group had a median viral load of 54,050 copies/mL, and 24% had a viral load above 100,000 copies/mL. Median CD4 count stood at 26 cells/mm<sup>3</sup>, and 58% of participants had a count below 50 cells/mm<sup>3</sup>.

Most treatment-emergent adverse events were mild to moderate, the most frequent being diarrhea in nine people, headache in eight, rashes, nausea, cough, and fatigue. Immune reconstitution inflammatory syndrome (IRIS) developed in one person who had to stop ibalizumab. There were no injection site reactions, and no anti-ibalizumab antibodies emerged.

Seven days after people got the 2000 mg loading dose of ibalizumab and started the optimised background regimen, 76% had at least a 0.5 log drop in viral load, and 57% had at least a 1 log (10-fold) drop.

Among 24 people who reached week 24, median viral load fell 2.6 log copies/mL (about 400 copies), 46% had a viral load under 50 copies/mL, and 71% had a load below 400 copies/mL. Eighteen of these 24 (75%) had at least a 1 log drop in viral load.

In the first 24 weeks, four people stopped treatment because of an adverse event, three stopped because of virologic failure, and three left the expanded-access programme to start commercially available ibalizumab. In 23 participants, median CD4 count rose from 61 to 93 cells/mm<sup>3</sup> through the first 24 weeks.

Among 17 people who reached expanded-access week 48, median viral load fell 2.6 log copies/mL, 47% had a viral load below 50 copies/mL, and 59% had fewer than 400 copies/mL. Two thirds of participants (65%) had at least a 1 log fall in viral load. At this point seven people had left the expanded-access program to start commercially available ibalizumab.

The researchers noted that these findings are consistent with results of the phase 3 trial. [3]

### References

1. Emu B, DeJesus E, Berhe M, et al. Ibalizumab efficacy and safety through 48 weeks of treatment: results of an expanded access protocol (TMB-311). IDWeek, October 2-6, 2019, Washington, DC. Abstract 661.  
[http://natap.org/2019/IDWeek/IDWeek\\_08.htm](http://natap.org/2019/IDWeek/IDWeek_08.htm) (natap report)
2. Trogarzo.  
<http://trogarzo.com/hcp>
3. Emu B, Fessel J, Schrader S, et al. Phase 3 study of ibalizumab for multidrug-resistant HIV-1. *N Engl J Med.* 2018;379:645-654.  
<https://www.nejm.org/doi/full/10.1056/NEJMoa1711460>

## Oral cabotegravir and rilpivirine is durable for 5.5 years in LATTE study

Mark Mascolini, natap.org

**Oral cabotegravir (CAB) and rilpivirine (RPV) taken for 288 weeks proved a durable and largely well-tolerated 2-drug maintenance regimen after 24 weeks of CAB plus 2 nucleosides in the venerable LATTE study. [1]**



Researchers reported only six protocol-defined virologic failures in 160 people (5%) who started CAB+RPV.

ViiV Healthcare researchers planned LATTE to pick an oral dose of the integrase inhibitor CAB and to test an oral CAB+RPV combination over several years of treatment. Development of CAB continues as both an oral drug and a long-acting injectable given with injectable RPV in LATTE-2 and other trials.

LATTE randomised antiretroviral-naïve adults in a 1:1:1 ratio to oral CAB at 10, 30, or 60 mg once daily or to 600 mg of efavirenz once daily, each with tenofovir/emtricitabine or abacavir/lamivudine. CAB recipients who had a viral load below 50 copies/mL immediately before study week 24 replaced their nucleosides with 25 mg of oral RPV and continued 10, 30, or 60 mg of CAB through 96 weeks. People randomised to efavirenz continued their 3-drug regimen. At week 96 efavirenz-treated people left the study, while the CAB+RPV group got the option to continue open-label once-daily CAB at 30 mg plus RPV at 25 mg through study week 312. Thus participants could take oral CAB+RPV for 288 weeks.

Seven years ago, when LATTE began, median ages across the four treatment groups ranged from 32 to 34. Almost all participants – 95% or more in each group – were men, about two thirds were white and about 30% of African heritage. Across the four treatment groups, 11% to 18% had a pretreatment viral load above 100,000 copies.

In LATTE's primary endpoint, FDA snapshot analysis at week 48 determined that 82% randomised to CAB+RPV versus 71% randomised to an efavirenz combination had a viral load below 50 copies/mL. In the open-label phase starting at 96 weeks, 142 people continued CAB+RPV.

At week 312 an intention-to-treat analysis among 160 participants who took at least one maintenance dose of CAB+RPV determined that 66% had a viral load below 50 copies, 9% had a load above 50 copies, and 25% had no virologic data. Among the 15 people with virologic failure at week 312, 4 (2.5% of 160) discontinued for lack of efficacy and 8 (5%) discontinued for other reasons while not below 50 copies.

After taking CAB+RPV for 5.5 years, 8 of 160 people (5%) had protocol-defined virologic failure. Six of these eight met virologic failure criteria through week 144, three of whom had treatment-emergent nonnucleoside mutations and one of whom had treatment-emergent integrase inhibitor mutations. The two people who had protocol-defined virologic failure between weeks 144 and 312 both had treatment-emergent integrase inhibitor and nonnucleoside mutations.

Among 160 people who took maintenance CAB+RPV, after 312 weeks 10 (6%) had grade 2 to 4 drug-related events, 8 (5%) had adverse events leading to withdrawal, 32 (20%) had serious adverse events, 2 (1%) had serious drug-related adverse events, and 69 (43%) had grade 3 or 4 treatment-emergent lab abnormalities (including 26 creatine kinase, 16 lipase, 13 LDL cholesterol, and 8 phosphate abnormalities). People taking CAB through week 312 gained a median of 6.5 kg (range -14.7 to +32.2 kg) since entering the trial. Median weight gain at week 96 had been 3.0 kg.

### Reference

1. Margolis DA et al. Long term efficacy, safety and durability of CAB and RPV as two drug oral maintenance therapy--LATTE week 312 results. IDWeek, October 2-6, 2019, Washington, DC. Abstract 2840. (natap report)

## Dolutegravir plus rilpivirine had good virologic, safety record in clinics before single tablet available

Mark Mascolini, natap.org

**Before single-table dolutegravir/rilpivirine (DTG/RPV) became commercially available, clinicians who combined the two drugs (DTG+RPV) in practice found high rates of virologic control and frequent attainment of treatment goals, according to results of a 10-site US study. [1]**



Only 5 of 66 people stopped DTG+RPV, and only two of them because of virologic failure.

In November 2017, DTG/RPV became the first single-tablet two-drug antiretroviral regimen licensed by the FDA. Intended as maintenance therapy for people already taking a suppressive regimen, DTG/RPV (Juluca) has now compiled two years of clinic-based experience. But before the single-tablet regimen became available, some clinicians gave DTG+RPV as separate pills for a variety of reasons. This study analysed that US experience.

This retrospective chart review involved 278 adults with HIV in care at 1 of 10 US sites and taking any DTG 2-drug regimen. Everyone began the 2-drug regimen before 31 July 2017 and had follow-up data at least to 30 January 2018. This report focused on 66 people (24% of 278) who took DTG+RPV.

Almost everyone starting DTG+RPV (94%) had antiretroviral experience, logging an average 15.5 years on treatment. Of these 66 people, 79% were men, 68% white, 23% black, and 14% Hispanic. Age averaged 56 years. More than one third of participants (39%) had documented comorbidities, and 26% had mental health issues. Almost half of the study group (49%) had taken four or more prior antiretroviral regimens.

Clinicians reported that people usually started DTG+RPV to avoid long-term toxicities (53%), to avoid toxicity or intolerance of other antiretrovirals (20%), or to simplify treatment (15%). All but one person took DTG+RPV once daily. The group averaged 1.6 years taking DTG+RPV at the time of this analysis.

CD4 count before DTG+RPV started averaged 666. Forty-six of 66 people (70%) had a viral load below 50 copies/mL when starting DTG+RPV, while the rest had a detectable load (averaging about 104,000 copies/mL). Of the 46 people who began DTG+RPV with an undetectable load, 45 (98%) still had an undetectable load at last follow-up. Among the 20 people with a detectable viral load when starting DTG+RPV, 12 (60%) attained and maintained viral suppression. Two people with an initially detectable load became undetectable then rebounded. Overall, 91% of participants achieved their goal with DTG+RPV, according to their clinician's report.

Five of 66 people (8%) stopped DTG+RPV during follow-up, two because of virologic failure, two for further treatment simplification, and 1 because of toxicity/intolerance.

"Despite being used in a much more experienced population," the researchers concluded, "real-world experience with DTG+RPV appears to be consistent with outcomes in phase 3 clinical trials".

#### Reference

1. Ward D et al. Real world experience with dolutegravir plus rilpivirine two-drug regimen. IDWeek, October 2-6, 2019, Washington, DC. Abstract 2485.

## Switching from TDF to TAF linked to higher BMI and cardio risk

Mark Mascolini, natap.org

**A 110-person retrospective study found increasing body mass index (BMI) and atherosclerotic cardiovascular disease (ASCVD) risk after a switch from tenofovir disoproxil fumarate (TDF) to tenofovir alafenamide (TAF), even though participants changed no other drugs in their regimen. [1]**



Thomas Jefferson University researchers said clinical implications could include the need to treat more people with statins to keep ASCVD risk in line.

Switching from TDF to TAF spares antiretroviral-treated people unwanted impacts on kidney and bone. But ongoing research indicates that trading TDF for TAF hurts cholesterol numbers and boosts weight, while the impact on ASCVD risk remains uncertain. To explore these issues, Thomas Jefferson researchers conducted a retrospective study to assess changes in BMI and ASCVD risk score when changing from TDF to TAF while maintaining other antiretrovirals in the regimen.

The analysis included 40- to 75-year-old adults who took a TDF-containing regimen for at least one year, during which they never had a viral load above 200 copies/mL. Everyone replaced TDF with TAF without changing their other antiretrovirals and had one year of observation after the switch. In the year before and the year after the change, researchers calculated median BMI, weight, total cholesterol, 'bad' low-density lipoprotein (LDL) cholesterol, 'good' high-density lipoprotein (HDL) cholesterol, and triglycerides. Using 2018 American College of Cardiology/American Heart Association guidelines, they figured ASCVD risk scores at the switch and 6 to 12 months afterwards. To assess changes in BMI and ASCVD risk score, the investigators used repeated measures generalised estimating equations.

The 110 study participants averaged 50 years in age, 73% were men, 58% black, 34.5% white, 5.5% Hispanic, and 2% Asian. While 31% were normal weight, 4% were underweight, 28% overweight, and 37% obese. The group spent a median of eight years taking antiretrovirals. Almost half (49%) took an integrase inhibitor with TDF, while 29% took an NNRTI, 16% a PI, and the rest something else.

Median weight, BMI, total and LDL cholesterol, and ASCVD risk score all climbed significantly after TAF replaced TDF: weight 185.4 to 190.5 lb ( $p<0.01$ ), BMI 28 to 28.2 kg/m<sup>2</sup> ( $p<0.01$ ), total cholesterol 173.8 to 195.0 mg/dL ( $p<0.01$ ), LDL cholesterol 98.6 to 112.1 mg/dL ( $p<0.01$ ), and ASCVD risk score 6.9% to 8.1% ( $p<0.01$ ). HDL cholesterol and triglycerides rose nonsignificantly and total-to-HDL cholesterol ratio did not change.

Regression analysis controlling for female sex linked switching from TDF to TAF to a 0.45-kg/m<sup>2</sup> jump in expected BMI. Regression analysis controlling for age, female sex, race, and time since HIV diagnosis tied swapping TDF for TAF to a 13% boost in expected ASCVD risk score.



The Thomas Jefferson researchers argued it was unlikely that rising BMI represented a “return to health” because participants had long-standing HIV infection well-controlled by antiretroviral therapy. Although observed BMI changes were small, the investigators added, they could have clinical relevance since even small BMI changes can affect lifetime risk for diabetes and ASCVD. The 13% jump in ASCVD risk score, they noted, lifted more than half of the study group to scores that would require statin therapy.

Now that the FDA has cleared TAF/FTC for preexposure prophylaxis, the findings could also have implications for steady PrEP users.

#### Reference

1. Schafer JJ et al. BMI and ASCVD risk score changes in virologically suppressed patients with HIV switching from TDF to TAF containing ART. IDWeek, October 2-6, 2019, Washington, DC. Abstract 979.  
[http://natap.org/2019/IDWeek/IDWeek\\_48.htm](http://natap.org/2019/IDWeek/IDWeek_48.htm) (natap report)

## Possible higher diabetes risk with raltegravir or PIs than NNRTIs

Mark Mascolini, [natap.org](http://natap.org)

**Starting antiretroviral therapy (ART) with an integrase inhibitor (INSTI) or protease inhibitor (PI) may confer a higher risk of diabetes than starting with a nonnucleoside (NNRTI), according to an analysis of 21,516 treated people in a North American cohort (NA-ACCORD). [1]**



Heightened diabetes risk with INSTIs proved significant for raltegravir, but not for dolutegravir or elvitegravir.

Some (but not all) research suggests greater weight gains with INSTIs than with regimens based on NNRTIs or PIs, but the clinical import of these gains remains unclear. To address this question, NA-ACCORD investigators compared diabetes incidence (the new-diagnosis rate) in antiretroviral-treated people during the past decade.

Researchers selected antiretroviral-naive adults starting an INSTI, an NNRTI, or a PI in their cohort from January 2007 to December 2016. The outcome of interest was incident diabetes, defined as HbA1c above 6.5%, diabetes-specific medication, or a diabetes diagnosis plus diabetes-related medication. Follow-up ran from the day ART began until incident diabetes, virologic failure, regimen core switch, death, loss to follow-up, or the closing date of December 2016.

The 21,516 study participants included 10,553 (49%) starting an NNRTI, 6677 (31%) starting a PI, and 4286 (20%) starting an INSTI. Overall, 13% of participants were female, 39% men who have sex with men, and 58% nonwhite. The NNRTI, PI, and INSTI groups differed by age (median 42, 41, and 38), initial CD4 count (median 313, 262, and 360), first year of ART (2010, 2010, and 2014), and follow-up time (3.04, 2.35, and 1.64 years). Among people starting an INSTI, the raltegravir, dolutegravir, and elvitegravir groups differed in median age (44, 37, and 35), first year of ART (2011, 2015, and 2014), and follow-up time (2.64, 1.02, and 1.54 years).

To explore incident diabetes risk by antiretroviral class, the researchers used Cox proportional hazards regression adjusted for age, sex, race/ethnicity, HIV transmission risk, calendar year starting ART, and baseline weight, CD4 count, and viral load.

Diabetes incidence per 1000 person-years measured 9.24 with NNRTIs, 12.03 with INSTIs, and 11.82 with PIs. Adjusted hazard ratios (aHR) indicated about a 25% higher diabetes risk with INSTIs or PIs than with NNRTIs. Adjusted risk stopped short of statistical significant with INSTIs (aHR 1.22, 95% confidence interval [CI] 0.95 to 1.57) but not with PIs (aHR 1.25, 95% CI 1.05 to 1.49).

A separate analysis compared incident diabetes risk with raltegravir, dolutegravir, elvitegravir, or PIs versus NNRTIs. Incidence per 1000 person-years measured 16.22 with raltegravir, 15.57 with dolutegravir, 10.73 with elvitegravir, 13.74 with PIs, and 9.72 with NNRTIs. Starting a PI remained significantly associated with greater diabetes risk than starting with an NNRTI (aHR 1.22). Among individual INSTIs, starting raltegravir was independently associated with greater diabetes risk (aHR 1.50), but starting dolutegravir (aHR 1.14) or elvitegravir (aHR 0.96) was not.

The NA-ACCORD team proposed that starting ART with an INSTI or a PI versus an NNRTI “may confer increased risk of incident diabetes mellitus, though risk is heterogeneous among INSTIs.” Further analysis exploring direct versus indirect effects of antiretroviral classes or drugs on incident diabetes, they suggested, may help determine “if elevated risk observed in these analyses is attributable partially to weight gain.”

#### Reference

1. Rebeiro PF, Jenkins C, Bian A, et al. The effect of initiating integrase inhibitor-based vs. non-nucleoside reverse transcriptase inhibitor-based antiretroviral therapy on progression to diabetes among North American persons in HIV care. IDWeek, October 2-6, 2019, Washington, DC. Abstract LB9.  
[http://natap.org/2019/IDWeek/IDWeek\\_13.htm](http://natap.org/2019/IDWeek/IDWeek_13.htm) (natap report)

## Fostemsavir interaction study flags strong CYP3A inducers, statins, oral contraceptives

Mark Mascolini, natap.org

**Fostemsavir, an HIV attachment inhibitor now being studied for heavily pretreated people, has few meaningful interactions with other antiretrovirals or with medications commonly used for HIV-related comorbidities. [1]**



There are four exceptions: dose adjustments are recommended for most statins and for ethinyl estradiol-based hormonal therapies, such as oral contraceptives. Strong CYP3A inducers, such as rifampin, will be contraindicated with fostemsavir, as will the dual-drug elbasvir/grazoprevir for HCV.

Now in a phase 3 trial combined with other antiretrovirals [2], fostemsavir binds to HIV gp120 near the CD4 binding site and thus blocks HIV attachment to the CD4 receptor on T cells. Fostemsavir is an oral prodrug of temsavir, which is metabolised primarily by an esterase-mediated hydrolysis pathway and partly via a CYP3A4-mediated oxidative pathway. ViiV Healthcare researchers and collaborators collected data from 11 drug-drug interaction studies to inform potential use of fostemsavir with other antiretrovirals and with drugs frequently used by people with HIV infection.

This analysis determined that strong CYP3A inducers like rifampin, as well as the anti-HCV combination agent elbasvir/grazoprevir, are contraindicated with fostemsavir. Because temsavir is partly metabolized by CYP3A4, strong CYP3A inducers significantly lower temsavir plasma concentrations and may impair virologic response to fostemsavir. Temsavir inhibits the transporter OATP1B1/3, and that could lead to higher grazoprevir concentrations and thus to elevated liver enzymes

Dose modifications may be needed when fostemsavir gets taken with three groups of agents:

1. Estrogen-based therapies such as oral contraceptives (ethinyl estradiol dose should be at or below 30 ug).
2. Statins (temsavir inhibits OATP1B1/3 and BCRP and thus affects pharmacokinetics of certain statins; use lowest possible starting statin dose, monitor for adverse events such as myopathy, and limit daily doses of certain statins, such as rosuvastatin  $\leq$  20 mg).
3. Drugs that prolong QT interval (use fostemsavir with caution with drugs that pose a risk of torsades de pointes, in people with pre-existing cardiac disease, or in older patients).

Analysed data indicate that no dose adjustment will be needed when fostemsavir is taken with other drugs frequently used by people with HIV:

1. Drugs that increase gastric pH, such as famotidine.
2. Strong CYP3A inhibitors, such as ritonavir and cobicistat.
3. Moderate CYP3A inducers, such as rifabutin and etravirine.
4. Other antiretrovirals including nucleosides, nonnucleosides, protease inhibitors, integrase inhibitors, CCR5 antagonists, or entry inhibitors including the monoclonal antibody ibalizumab, which is licensed for people with multidrug-resistant HIV.
5. Opioid-dependence therapies such as methadone and buprenorphine.

#### References

1. Moore KP et al. Fostemsavir drug-drug interaction profile, an attachment inhibitor and oral prodrug of temsavir, for heavily treatment experienced HIV-1 infected patients. IDWeek, October 2-6, 2019, Washington, DC. Abstract 2500.  
[http://natap.org/2019/IDWeek/IDWeek\\_30.htm](http://natap.org/2019/IDWeek/IDWeek_30.htm) (natap report)
2. ClinicalTrials.gov. Attachment inhibitor comparison in heavily treatment experienced patients. ClinicalTrials.gov identifier NCT02362503.  
<https://clinicaltrials.gov/ct2/show/NCT02362503>

## Over half of mostly black US HIV group has NAFLD – and many have NASH

Mark Mascolini, natap.org

**Prevalence of nonalcoholic fatty liver disease (NAFLD) lay above 50% in a two-thirds black HIV group in Newark, NJ, higher than the 43% prevalence reported in a largely white HIV group in Palermo, Italy. [1]**



The US group had spent an average five more years on antiretroviral therapy (ART) than the Palermo group, and a higher proportion in the US cohort had diabetes. Prevalence of nonalcoholic steatohepatitis (NASH) was also higher in the US group.



A review of recent literature noted increasing reports of NAFLD and NASH in people with HIV infection [2]. A Netherlands group proposed that insulin resistance, mitochondrial dysfunction, and dyslipidemia drive NAFLD pathogenesis and progression to NASH in people with HIV [3]. But prevalence and risk factors for these conditions remain poorly understood, as does the potential impact of ART.

To learn more about NAFLD and NASH in ART-treated people, clinicians at Saint Michael's Medical Center in Newark prospectively gathered data on HIV positive people undergoing transient elastography (TE) at their center from November 2017 to September 2018. They compared their findings with a recent report on NAFLD and NASH in HIV-monoinfected patients at the University Hospital of Palermo [4]. The Newark team defined NAFLD and fibrosis severity by the same measures used in Palermo, Controlled Attenuation Parameter (CAP) above 248 dB/m and TE above 7.1 Kpa.

The Newark cohort included 624 consecutive patients with HIV, who did not differ significantly from the Palermo group in age or sex. NAFLD prevalence was high in both groups, but higher in Newark (51.6%) than in Palermo (42.7%). Among people with NAFLD, NASH prevalence was also higher in Newark (31%) than Palermo (23%).

The Newark and Palermo patient clusters differed in race (68% black in Newark, 87% white in Palermo), diabetes prevalence (20% in Newark, 6% in Palermo, although body mass index did not differ significantly between groups), and longer time on ART in Newark (average 5 years). The Newark team also noted trends in a lower percentage of patients with a viral load below 20 copies, a lower average CD4 count, a higher percentage taking integrase inhibitors, and a higher prevalence of hypertension in the Newark patients.

The Newark investigators concluded that the prevalence of NAFLD is alarmingly high in people with HIV. Gaining a better understanding of NAFLD in HIV patients is urgent, they stressed, "to prevent the potentially severe consequences of NASH". Because their study suggested longer antiretroviral duration may favour development of NAFLD, the Newark team urged closer monitoring of liver health as soon as ART begins.

#### References

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2. Rockstroh JK. Non-alcoholic fatty liver disease (NAFLD) and non-alcoholic steatohepatitis (NASH) in HIV. *Curr HIV/AIDS Rep.* 2017;14:47-53.
3. van Welzen BJ, Mudrikova T, El Idrissi A, Hoepelman AIM, Arends JE. A review of non-alcoholic fatty liver disease in HIV-infected patients: the next big thing? *Infect Dis Ther.* 2019;8:33-50. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6374241/>
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## People taking more medications and women have higher fall risk in older HIV group

Mark Mascolini, [natap.org](http://natap.org)

**Women in a US HIV clinic population had more than a 50% higher risk of falling than men, according to results of a 2208-person case-control study. [1]**



Every additional medication taken boosted odds of falling almost 10% in this retrospective analysis of men and women with HIV.

Falls become more prevalent as people with and without HIV age. And because people with HIV often have low bone mineral density, falls pose a concerning risk of fracture. In a prior US study of 359 people with HIV, 30% reported one or more falls; odds of falling were 1.7-fold higher with each additional comorbidity and 1.4-fold higher with each additional medication. [2]

A comparison of 536 HIV positive and negative men and women in two US cohorts recorded self-reported fall rates of 24% in people with HIV and 18% in HIV-negative people at risk for HIV infection. [3]

University of California, San Diego (UCSD) researchers reviewed records of HIV positive people 50 or older seen in their clinic from September 2012 to August 2017. They retrospectively determined which people had a documented fall (cases) and which did not (controls). The investigators used logistic regression analysis to identify fall predictors.

Among 2208 people studied, 643 fell and 1565 did not. Cases with falls did not differ from controls without falls in race, ethnicity, CD4 count, or viral load at the time of the fall. Univariate analysis identified 4 fall predictors: (1) older age: (average 59.0 versus 57.5 years,  $p < 0.0001$ ), (2) female gender (17.1% versus 10.3%,  $p < 0.001$ ), (3) taking more total medications (average 11.2 versus 7.5,  $p < 0.001$ ), and (4) taking more antiretrovirals (average 3.8 versus 3.3,  $p < 0.0001$ ).

Multivariate analysis confirmed older age, female gender, and more medications as independent predictors of falls. For female gender and each additional medication, the adjusted odds ratios (aOR) and 95% confidence intervals (CI) were:

- Female gender: aOR 1.56 (95% CI: 1.18 to 2.05) .
- Each additional medication taken: aOR 1.09 (95% CI: 1.07 to 1.11 )

The UCSD findings confirmed the impact of polypharmacy on falls in people with HIV seen in a prior smaller study. [2]

The researchers endorsed study of limiting prescriptions in HIV-positive people taking high numbers of drugs “to prevent harmful outcomes” such as falls.

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3. Erlandson KM et al. Fall frequency and associated factors among men and women with or at risk for HIV infection. *HIV Med*. 2016;17:740-748.

## No link between raltegravir and adverse birth outcomes in analysis in 2550 women

Mark Mascolini, natap.org

### Analysis of 2550 prospective pregnancy reports found no association between raltegravir use and adverse birth outcomes. [1]



Rates of spontaneous abortion, stillbirth, and major congenital anomalies matched those seen in the background population. Most of the reports came from the United States and Western Europe.

Not structurally similar to other HIV integrase inhibitors, raltegravir has been licensed since 2007 and is approved for use in neonates weighing at least 2 kg, children, adolescents, and adults. Neural tube defects have been described in infants of women taking dolutegravir in the periconception period. The purpose of this analysis was to assess all pregnancy outcomes among women taking raltegravir, especially potential neural tube defects following periconception raltegravir exposure.

The analysis focused on prospective raltegravir exposures – those received before the pregnancy outcome was known. Merck researchers collected data from three sources: prospective pregnancy outcomes reported to the Merck safety database and two published European sources not included in the Merck database – the National Study of HIV in Pregnancy and Childhood (NSHPC) in the United Kingdom and Ireland and the ANRS-French Perinatal Cohort.

Through 27 May 2019, the Merck safety database included 961 prospective reports with 976 outcomes, about half of them from the United States, about half dating from the first trimester and one third involving periconception exposure. Among the 976 pregnancy outcomes in the Merck database, there were 892 live births, 33 major congenital anomalies (no neural tube defects), 36 spontaneous abortions, 11 stillbirths or foetal deaths, 35 elective terminations, and 2 ectopic pregnancies. Rates of congenital anomalies per live birth, spontaneous abortion, and stillbirths were similar to those in the US general population.

The UK/Ireland NSHPC database involved 886 raltegravir exposures during pregnancy from 2008 through 2018, including 256 in the first trimester, of which 222 involved exposure to raltegravir at the time of conception. The overall congenital anomaly rate was 2.59%, and the rate for exposure at conception was 2.25%. The NSHPC recorded no neural tube defects.

The ANRS-French Perinatal Cohort saw no evidence of a higher birth defect rate among 218 women taking raltegravir at conception. And the French reported no neural tube defects with raltegravir.

The Merck team concluded that these three large databases (focused largely on the United States and Western Europe) produced no data suggesting an association between raltegravir during any stage of pregnancy and adverse birth outcomes. Rates of spontaneous abortions, stillbirths, and major congenital anomalies reflected general-population rates in the regions studied. The 765 recorded periconception raltegravir exposures led to no neural tube defects.

#### Reference

1. Shamsuddin H et al. Pregnancy outcomes following raltegravir exposure. IDWeek, October 2-6, 2019, Washington, DC. Abstract 886. [http://natap.org/2019/IDWeek/IDWeek\\_33.htm](http://natap.org/2019/IDWeek/IDWeek_33.htm) (natap report)

## PrEP linked to lower HIV incidence in US, independent of TasP

Mark Mascolini, natap.org

**Regardless of the impact of HIV treatment as prevention (TasP), preexposure prophylaxis (PrEP) with tenofovir/emtricitabine independently contributed to declining HIV diagnoses (incidence) in 105 US metropolitan areas from 2012 through 2017. [1]**



HIV incidence fell most in metropolitan areas with the highest PrEP use.

Tenofovir/emtricitabine was licensed for PrEP in July 2012. Over the past decade, HIV incidence has been dwindling in the United States. Gilead Sciences researchers who conducted this study noted that falling incidence could reflect increased HIV testing, earlier antiretroviral therapy, higher proportions of HIV positive people with an undetectable viral load, and growing use of PrEP. They conducted this study to assess the contributions of PrEP and TasP to the falling rate of new HIV diagnoses in US metropolitan statistical areas (MSAs).

The Gilead team analysed data from four sources.

1. Annual CDC HIV surveillance by MSA.
2. CDC estimates of PrEP use by jurisdiction, transmission risk group, and race/ethnicity.
3. National Real-World Data containing more than 84% of all tenofovir/emtricitabine PrEP prescriptions in the United States.
4. US census population estimates for MSAs over the period 2012-2017.

They calculated HIV incidence per 100 person-years with a formula in which the numerator was new HIV diagnoses by MSA per year and the denominator was (adults with PrEP indication alive at the beginning of each period x 1 year) – (new HIV diagnoses x average time exposed) – persons on PrEP x average time exposed with PrEP).

The investigators calculated PrEP use in 105 MSAs from a national pharmacy and medical claims databased and adjusted per the number of people at risk for HIV based on CDC surveillance. To calculate HIV incidence rates and incidence rate ratios, they used a Poisson regression model reflecting rate changes for each MSA over time after statistical adjustment for the effect of PrEP and TasP.

HIV incidence per 100 person-years fell steadily over the study period: from 4.72 in 2012 to 4.65 in 2013 to 4.18 in 2014 to 3.70 in 2015 to 3.66 in 2016 to 3.46 in 2017. Over those same 6 years, PrEP use per 100 persons with a PrEP indication rose from 1.6 to 2.2 to 4.4 to 9.6 to 11.9 to 15.4. PrEP use grew by an average 2.95% yearly. At the same time, the proportion of people with virologic suppression (viral load below 200 copies/mL and at least one viral load test in the calendar year) rose from 79.8% in 2012 to 81.9% in 2013 to 83.3% in 2014 to 84.5% in 2015 to 85.7% in 2016 and to 86.7% in 2017. The proportion of people with viral suppression rose by 1.34% yearly.

Next the researchers divided the PrEP use rate into five equal portions or quintiles. With each higher quintile, the change in HIV incidence per year fell:

- PrEP use 1.03, HIV incidence per year -0.23
- PrEP use 2.57, HIV incidence per year -0.57
- PrEP use 5.44, HIV incidence per year -1.2
- PrEP use 9.67, HIV incidence per year -2.13
- PrEP use 19.3, HIV incidence per year -4.24

The Poisson model determined that PrEP contributed 5.9% to declining HIV incidence over 2012 to 2017. For the same period, TasP contributed 2.9% to the decline. The model compared PrEP to no PrEP with TasP in the model, while it compared TasP to no TasP with PrEP in the model. With both PrEP and TasP in the model, the PrEP effect was 2.1 times greater than the TasP effect.

The Gilead investigators concluded that, from 2012 to 2017, HIV incidence dropped faster in MSAs with higher PrEP use. "The PrEP effect was statistically significant," they observed, "was independent of viral suppression, and was greater than the TasP effect." Using the same model, the researchers calculated that HIV incidence will fall by 41% by 2022 if PrEP use jumps by 50%.

#### Reference

1. Mera-Giler R et al. PrEP Significantly reduces the rate of new HIV diagnoses in US metropolitan statistical areas independent of treatment as prevention (2012-2017). IDWeek, October 2-6, 2019, Washington, DC. Abstract 1963.  
[http://natap.org/2019/IDWeek/IDWeek\\_47.htm](http://natap.org/2019/IDWeek/IDWeek_47.htm) (natap report)

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## ANTIRETROVIRALS

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### Dual dolutegravir/lamivudine submitted to US FDA as switch option

Simon Collins, HIV i-Base

**On 16 October 2019, ViiV Healthcare reported that the company had submitted a supplemental new drug application to the US FDA to use dolutegravir/lamivudine as a switch options for adults with undetectable viral load on their current combination. [1]**

This is based on results from the phase 3 TANGO study, reported at IAS 2019. [2]

The current indication, both in the EU and the US is for use as initial ART in people without resistance to either drug.

The fixed dose combination (FDC) of dolutegravir is marketed with the trade name Dovato.

#### References

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<https://viivhealthcare.com/en-gb/media/press-releases/2019/october/viiv-healthcare-submits-supplemental-new-drug-application-to-us->
2. van Wyk J et al. Switching to DTG+3TC fixed dose combination (FDC) is non-inferior to continuing a TAF-based regimen (TBR) in maintaining virologic suppression through 24 weeks (TANGO Study). 10th IAS Conference on HIV Science (IAS 2019), 21-24 July 2019, Mexico City. Late-breaker oral abstract WEAB0403LB.  
<http://programme.ias2019.org/Abstract/Abstract/4903>
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<http://i-base.info/htb/36450>

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## TREATMENT ACCESS

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### Global Fund raises US\$14 billion for 2020 to 2022

UNAIDS press release

**On 11 October 2019, UNAIDS issued a press statement saying that it is hugely encouraged by the firm commitment that donors have shown to the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund).**

At its Sixth Replenishment Conference, held in Lyon, France, on 9 and 10 October 2019, the Global Fund raised US\$ 14.02 billion, the highest amount ever for the partnership, which is working to end the three diseases.

UNAIDS congratulates the President of France, Emmanuel Macron, for his personal engagement and his call on countries to increase their pledges to honour the proposed 15% increase above the last replenishment. Most donors matched or surpassed the 15% increase and many new donors attended and pledged for the first time.

UNAIDS will continue to work closely with the Global Fund providing strategic information, technical expertise and capacity-building to countries in sourcing and implementing Global Fund grants. UNAIDS advocates for a people-centred, human rights-based approach to ending AIDS and fully supports the active engagement of civil society and community-based organisations in reaching the most marginalised people and people being left behind. In 2018, there were 37.9 million people living with HIV, 15 million of whom are still in urgent need of access to life-saving antiretroviral therapy.

The pledges to the Global Fund will boost the response to HIV. UNAIDS will continue to advocate for increased investment to meet the full resource needs of the AIDS response to end AIDS by 2030 as part of the Sustainable Development Goals.

#### Reference

UNAIDS press release. UNAIDS thanks all donors for pledging full funding for the Global Fund to Fight AIDS, Tuberculosis and Malaria: **The Global Fund to Fight AIDS, Tuberculosis and Malaria has raised US\$ 14 billion for the three diseases for a three-year period (2020–2022).** (11 October 2019).

[https://www.unaids.org/en/resources/presscentre/pressreleaseandstatementarchive/2019/october/20191011\\_global-fund](https://www.unaids.org/en/resources/presscentre/pressreleaseandstatementarchive/2019/october/20191011_global-fund)

## UK contributes £1.4 billion towards Global Fund for 2020 to 2022

### STOP AIDS press release

**On 11 October 2019, the Global Fund to Fight AIDS, Tuberculosis and Malaria has raised an unprecedented \$14.02 billion at its Replenishment Meeting in Lyon, France. President Emmanuel Macron hosted the meeting and galvanised world leaders' resolve to step up the fight and meet the \$14 billion target so that the Global Fund can help save 16 million lives over the next three years.**

The UK Government showed incredible leadership, alongside other donor countries, in increasing their previous contribution by 16% to £1.4 billion, an investment which will help save two million lives. France, Germany, Italy, Ireland and Portugal all increased their pledges by at least 15 percent. Secretary of State for International Development, The Rt Hon. Alok Sharma MP announced the UK's full pledge was unlocked, with the Malaria Match portion complemented with Private Sector investments. We highly commend the UK for demonstrating what true global leadership to defeat the world's three deadliest epidemics looks like.

STOPAIDS Director and Global Fund Board Member Mike Podmore was present in the meeting to witness the excitement as President Macron committed a 15% increase from France before challenging all those donors who hadn't met that increase level to step up. He even threatened to lock everyone in the room until the target had been met. Many did make further pledges and finally President Macron and Bill Gates pledged an additional 60 million each and committed to mobilise a further 100 million that pushed the total over the target.

Mike Podmore said, "The current global political climate is not easy and we went in to the replenishment concerned we would not meet the \$14 billion target. This was doubly worrying because \$14 billion is the minimum of what is needed to keep the Global Fund on track to meet its own strategic targets, let alone get back on track to deliver the global plans to end the three diseases.

"But what happened here today was inspirational and shows what international cooperation for health can achieve. The UK was one of many donor countries to step up on their previous commitments and we also heard pledges from new government and private sector donors - without whom we would not have seen success.

"However, we must contextualise today's result in the wider funding for global health picture. Whilst \$14 billion is undeniably a significant amount of money that will drive incredible results it falls short of calculations of what would be needed to meet global need across the three diseases. The Global Fund Advocate Network Get on Back Report estimated that between \$16.8 and \$18 billion should be the real target of replenishment.

"We know that there are severe resource gaps in the HIV response that must be closed if we are to meet the targets set out in the Sustainable Development Goals and STOPAIDS will continue to work with our members and global partners in efforts to help close them."

"Today's replenishment meeting was a critical step in the right direction, demonstrating donors' commitment to the Global Fund's critical role in ending the three diseases. We hope the incredible momentum and energy we saw today builds forward to help us achieve our goal of ending AIDS, TB and malaria for good."

#### Reference

STOP AIDS press release. STOPAIDS celebrates Global Fund to Fight AIDS, TB and Malaria replenishment outcome (11 October 2019).  
<https://stopaids.org.uk/2019/10/10/stopaids-celebrates-global-fund-to-fight-aids-tb-and-malaria-replenishment-outcome>

## GUIDELINES

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### NHS England best practice in HIV prescribing and multidisciplinary teams

#### HIV CGR

**The Best Practice in HIV Prescribing document has now been published by the HIV Clinical Reference Group (CRG).**

This document sets out the CRG's principles for providing clinical advice to NHS England on HIV prescribing, including the role, composition and operation of multidisciplinary team (MDT) meetings.

#### Reference

HIV CRG. Best Practice in HIV Prescribing. (October 2019)  
<https://www.england.nhs.uk/commissioning/spec-services/npc-crg/blood-and-infection-group-f/f03>

## PREVENTION

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### **US approves F/TAF for PrEP (Descovy): indication excludes risk from receptive vaginal sex**

**Simon Collins, HIV i-Base**

**On 3 October 2019, the US FDA approved the dual formulation F/TAF with a new indication for HIV pre-exposure prophylaxis (PrEP). [1]**

This is the second oral drug to be approved as PrEP.

Approval was based on results from the phase 3 DISCOVER study reported earlier this year at CROI that used F/TDF as an active control. [2]

However, approval was controversial for only allowing a limited indication based on the study population in DISCOVER: gay or bisexual men and transgender women.

The application had been for adult use (including woman) and the split panel decided that efficacy data was required in all populations for a broad indication.

The decision not to include women in the initial phase 3 studies was questioned at the time and the manufacturers now have a post marketing commitment to run additional studies in cisgender women and adolescent girls. [1]

More recent data from the DISCOVER study have shown that the pharmacokinetic benefits of F/TAF might have significant advantages for women. [3]

F/TAF is manufactured by Gilead Sciences with the trade name Descovy.

#### References

1. Gilead press release. US Food and Drug Administration approves Descovy for HIV pre-exposure prophylaxis (PrEP). (03 October 2019). <https://www.gilead.com/news-and-press/press-room/press-releases/2019/10/us-food-and-drug-administration-approves-descovy-for-hiv-preexposure-prophylaxis-prep>
2. Collins S. New option for PrEP – TAF/FTC is non-inferior to TDF/FTC: results of phase 3 DISCOVER study. HTB 12 March 2019. <http://i-base.info/htb/35809>
3. Collins S. PK advantages of TAF/FTC over TDF/FTC for HIV PrEP might compensate for low adherence: sub-analysis of DISCOVER study. HTB (23 August 2019). <http://i-base.info/htb/36592>

## PATHOGENESIS

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### **Science journal retracts article linking CCR5 deletion to reduced life expectancy**

**Richard Jefferys, TAG**

**In June 2019, a short paper was published in the journal Nature Medicine reporting that individuals homozygous for the CCR5-Δ32 mutation showed a 21% increase in the rate of all-cause mortality compared to those without the mutation (or heterozygotes, who inherit the mutation from one parent). [1]**

The senior author, Rasmus Nielsen, stated to the Wall Street Journal that this would equate to a nearly two-year shortening of lifespan on average. [2]

The findings were the subject of hundreds of media articles, largely because they came on the heels of a misguided and completely unethical experiment in which the CCR5 gene was edited in two embryos, leading to the birth of genetically altered twins. [3]

Questions were also raised about possible relevance to HIV cure research studies that attempt to ablate CCR5 expression with gene therapies. [4]

Yesterday, Nature Medicine published a notice that the paper has been retracted. [5]



News that the retraction was imminent emerged two weeks ago in an article by Rebecca Robbins for STAT News, after Nielsen tweeted an acknowledgement that a major error had been found. [7]

The original analysis was based on data from the UK Biobank, and it turned out that a technical artifact meant that individuals homozygous for the CCR5- $\Delta$ 32 mutation were underrepresented in the data (the problem is outlined in a paper available on the bioRxiv preprint server). [8]

These developments do not necessarily mean that homozygosity for the CCR5- $\Delta$ 32 mutation is entirely benign; a number of published reports have suggested an association with impaired responses to certain infectious diseases (particularly West Nile Virus, and possibly influenza as well). [9, 10]

Also, previously unappreciated roles of the CCR5 receptor continue to be identified, such as the promotion of hematopoietic stem and progenitor cell regeneration after radiation treatment. [11] But, after this retraction, there is no evidence (at least as yet) that any negative effects of the CCR5- $\Delta$ 32 mutation add up to a reduced life expectancy for homozygous individuals.

#### Source

Jefferys R. Widely Publicized Report Associating the CCR5- $\Delta$ 32 Mutation with Reduced Longevity is **Retracted**. *TAB Basic Science Blog*. (09 Oct 2019).

[https://tagbasicscienceproject.typepad.com/tags\\_basic\\_science\\_vaccin/2019/10/widely-publicized-report-associating-the-ccr5-%CE%B432-mutation-with-reduced-longevity-is-retracted.html](https://tagbasicscienceproject.typepad.com/tags_basic_science_vaccin/2019/10/widely-publicized-report-associating-the-ccr5-%CE%B432-mutation-with-reduced-longevity-is-retracted.html)

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1. Wei X, Nielsen R. CCR5- $\Delta$ 32 is deleterious in the homozygous state in humans. *Brief Communication*. *Nature* 2019; 25; 909–910 (03 June 2019). <https://www.nature.com/articles/s41591-019-0459-6>
2. Rana P. Study of HIV-related mutation adds to worries about first gene-edited babies (05 June 2019). <https://www.wsj.com/articles/study-of-hiv-related-mutation-adds-to-worries-about-first-gene-edited-babies-11559646973>
3. Jeffery R. Treatment Action Group statement on the reported birth of twins with edited CCR5 genes. *TAG Blog*. (26 November 2018). <http://www.treatmentactiongroup.org/content/treatment-action-group-statement-reported-birth-twins-edited-ccr5-genes>
4. Sax P. Exploiting the CCR5 Receptor: Potential Avenue for HIV Cure? *Medscape*. Commentary. (19 July 2019). <https://www.medscape.com/viewarticle/915384>
5. Wei X, Nielsen R. Retraction Note: CCR5- $\Delta$ 32 is deleterious in the homozygous state in *Nature Medicine* (2019). <https://www.nature.com/articles/s41591-019-0637-6>
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10. Falcon A et al. CCR5 deficiency predisposes to fatal outcome in influenza virus infection. *Jour Gen Viro* 96 (8). (01 August 2015). <https://www.microbiologyresearch.org/content/journal/jgv/10.1099/vir.0.000165>
11. Piryani SO et al. CCR5 signaling promotes murine and human hematopoietic regeneration following ionizing radiation. *Stem Cell Reports*. 13 (1);76-90. (09 July 2019). [https://www.cell.com/stem-cell-reports/fulltext/S2213-6711\(19\)30145-6](https://www.cell.com/stem-cell-reports/fulltext/S2213-6711(19)30145-6)

## FUTURE MEETINGS

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### Conference listing 2019/2020

The following listing covers some of the most important upcoming HIV-related meetings and workshops.

#### **International Workshop on HIV Drug Resistance and Treatment Strategies**

16 – 18 October 2019

[www.hivresistance2019.co.za](http://www.hivresistance2019.co.za)

#### **21st Intl Workshop on Comorbidities and Adverse Drug Reactions in HIV**

5 – 6 November 2019, Basel, Switzerland

[www.intmedpress.com/comorbidities/](http://www.intmedpress.com/comorbidities/)

#### **17th European AIDS Conference**

6 – 9 November 2019, Basel

[www.eacsociety.org](http://www.eacsociety.org)

#### **3rd European Chemsex Forum**

14-16 November 2019, Paris

[ihp.hiv](http://ihp.hiv)

#### **Conference on Retroviruses and Opportunistic Infections (CROI 2020)**

8–11 March 2020, Boston

[www.croiconference.org](http://www.croiconference.org)

#### **10th International Workshop of HIV & Women**

6 – 7 March 2020

[www.virology-education.com](http://www.virology-education.com)

#### **21st International Workshop on Clinical Pharmacology of HIV, hepatitis, and other antiviral drugs**

13 – 15 May 2020 (TBC), New York

[www.virology-education.com](http://www.virology-education.com)

#### **International Workshop on HIV Paediatrics 2020**

3 – 4 July, San Francisco tbc

[www.virology-education.com](http://www.virology-education.com)

#### **23rd International AIDS Conference (AIDS 2020)**

6 – 10 July 2020, San Francisco and Santa Barbara

[www.aids2020.org](http://www.aids2020.org)

#### **HIV Glasgow Congress 2020**

4 – 7 October 2020

[www.hivglasgow.org](http://www.hivglasgow.org)

## PUBLICATIONS & SERVICES FROM i-BASE

### i-Base website

**All i-Base publications are available online, including editions of the treatment guides.**

<http://www.i-Base.info>

The site gives details about services including the UK Community Advisory Board (UK-CAB), our phone service and Q&A service, access to our archives and an extensive range of translated resources and links.

Publications and regular subscriptions can be ordered online.

The Q&A web pages enable people to ask questions about their own treatment:

<http://www.i-base.info/qa>

### i-Base treatment guides

i-Base produces six booklets that comprehensively cover important aspects of treatment. Each guide is written in clear non-technical language. All guides are free to order individually or in bulk for use in clinics and are available online in web-page and PDF format.

<http://www.i-base.info/guides>

- Introduction to ART (May 2018)
- HIV & quality of life: side effects & long-term health (Sept 2016)
- Guide to PrEP in the UK (March 2019)
- HIV testing and risks of sexual transmission (June 2016)
- Guide to changing treatment and drug resistance (Jan 2018)
- Guide to HIV, pregnancy & women's health (April 2019)

### Pocket guides

A series of pocket-size concertina folding leaflets that is designed to be a very simple and direct introduction to HIV treatment.

The five pocket leaflets are: Introduction to ART, HIV and pregnancy, ART and quality of life, UK guide to PrEP and HCV/HIV coinfection.

The leaflets use simple statements and quotes about ART, with short URL links to web pages that have additional information in a similar easy format.

### U=U resources for UK clinics: free posters, postcards and factsheets

i-Base have produced a new series of posters, postcards and leaflets to help raise awareness about U=U in clinics.

This project was developed with the Kobler Centre in London.

As with all i-Base material, these resources are all free to UK clinics.

Until our online order form is updated to include the U=U resources, more copies can be ordered by email or fax.

email: [subscriptions@i-base.org.uk](mailto:subscriptions@i-base.org.uk)

### Customise U=U posters for your clinic

i-Base can customise U=U posters to include pictures of doctors, nurses, pharmacists, peer advocates or any other staff that would like to help publicise U=U.

Personalising these for your clinic is cheap and easy and might be an especially nice way to highlight the good news.

For further information please contact Roy Trelvelon at i-Base:

[roy.trelvelon@i-Base.org.uk](mailto:roy.trelvelon@i-Base.org.uk)

### Order publications and subscribe online

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## ***h-tb***

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