

Kidney Problems Are Uncommon Among People Taking PrEP Pills

Changes in kidney function were small for those using TDF/FTC either daily or on-demand for HIV prevention.

February 17, 2023 By [Liz Highleyman](#)

Tenofovir disoproxil fumarate for [pre-exposure prophylaxis \(PrEP\)](#) is generally safe for the kidneys, according to study results published in the [Journal of Antimicrobial Chemotherapy](#). People using daily PrEP saw a slightly larger decline in kidney function over two years compared with those taking the pills intermittently, but the difference was not deemed to be clinically important.

“In our study, the renal safety of PrEP with tenofovir disoproxil/emtricitabine was good, whatever the dosing regimen,” the study authors concluded.

For people without preexisting kidney problems, tenofovir disoproxil fumarate/emtricitabine (TDF/FTC; Truvada or generic equivalents) is a safe and effective way to prevent HIV. Studies have shown that daily PrEP and on-demand PrEP taken before and after sex work equally well for gay and bisexual men and transgender women. But TDF is metabolized by the kidneys, and it can lead to impaired kidney function in susceptible individuals, especially those who use it as part of a combination regimen for HIV treatment. For PrEP, taking the pills less often could reduce the risk.

Jean-Michel Molina, MD, and colleagues with the French ANRS-PREVENIR Study Group assessed the impact of different PrEP dosing regimens on kidney function. In particular, they looked at the [estimated glomerular filtration rate \(eGFR\)](#), a measure of how fast the kidneys filter toxins such as creatinine out of the blood. An eGFR of 90 or above is considered normal, a rate below 60 indicates mild to moderate kidney function impairment, below 30 indicates severe impairment and below 15 means kidney failure.

The analysis included 1,235 participants in the PREVENIR trial, which compared daily versus on-demand PrEP. Almost all were men who have sex with men, and the median age was 34. Because of TDF’s known effect on the kidneys, the study was limited to those with adequate kidney function at baseline, with an eGFR cutoff of 50. About 40% were considered to have risk factors for kidney dysfunction, including age over 40 or existing mild impairment (eGFR below 90).

Participants chose whether to use the daily or on-demand dosing schedule and could switch between them. The on-demand regimen, also known as [PrEP 2-1-1](#), involves taking two doses of

TDF/FTC between two and 24 hours before anticipated sex, one dose 24 hours after the initial double dose and a final dose 24 hours after that. As previously reported, [both regimens were highly effective](#).

For this analysis, PrEP users were retrospectively divided into three groups: daily use (40%), on-demand use (39%) and those who switched from one regimen to the other (21%). The three groups took a median of 6.0, 1.7 and 4.0 pills per week, respectively. The researchers asked participants about their PrEP use every three months and collected blood samples to measure creatinine levels, which are used to calculate eGFR. They compared the area under the curve (AUC), or the total change in eGFR measured over time. A negative value indicates a decline in kidney function, while a positive value indicates an improvement.

Kidney function initially declined in all groups during the first three months after starting PrEP but then gradually rose. Over a median follow-up period of about two years, kidney function declined slightly in the daily and switch groups (AUC of -1.09 and -0.69, respectively) and rose slightly in the on-demand group (AUC of +0.18).

After adjusting for age and baseline eGFR, the AUC was significantly higher with on-demand PrEP versus daily PrEP (+0.39 and +1.47, respectively). Among those with preexisting risk factors, the AUC again differed significantly (+0.21 and -1.44, respectively). But the researchers did not consider these small changes to be clinically important. Only five people, distributed across the groups, saw an eGFR decline of 25% or more.

“On-demand PrEP dosing had a smaller impact on eGFR evolution than daily PrEP, but the difference was not clinically relevant,” the study authors concluded.

These findings show that both daily and on-demand TDF/FTC are safe for people who start PrEP with adequate kidney function. For those at risk for kidney problems, on-demand PrEP might be preferable but only for those who have sex seldom enough and predictably enough to use fewer pills per week.

Another option for those at risk—including older people and those with existing mild kidney impairment—is tenofovir alafenamide/emtricitabine (TAF/FTC or Descovy; generics not yet available). TAF, a newer formulation of tenofovir, [works equally well for PrEP](#). While [TAF is easier on the kidneys and bones](#), it may lead to weight gain in people who switch from TDF.

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