

AIDS TREATMENT UPDATE

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Sex sells

Retrovirus conference data on oral sex and super-infection steal the headlines

INTERVIEWS BY ROBERT FIELDHOUSE

Amongst the hundreds of reports presented at this year's Retrovirus Conference held in San Francisco in February, two in particular seem to have received a disproportionate amount of press coverage. A study of the role of unprotected oral sex in HIV transmission between men, and a case report of HIV super-infection have renewed interest in the debate about what kinds of sex people are having and indeed, can feel safe in having.

A team of researchers from San Francisco and the Centers for Disease Control and Prevention in Atlanta, found that 8 of 122 men who had recently acquired HIV could identify no other possible route of transmission than unprotected oral sex. Whilst the researchers clearly stated "despite lower transmission risk, oral sex may be an important mode of HIV transmission due to its frequency", they did not conclude that the rates found in their sample could be used in isolation to predict the relative risk of unprotected oral sex among the general population. Nonetheless, much of the press could not resist the temptation to present the danger of oral sex as "high", and the relevance of these findings ran the risk of being all but lost amongst the spin and panic.

Researchers from Canada presented the case of an HIV-positive man who had been super-infected with drug resistant HIV after having had a sexual relationship with another HIV-positive man. Super-infection with a second, perhaps more virulent, or drug resistant HIV strain has always been a concern for many positive people and researchers alike. It has been one of many arguments used to motivate positive people to maintain safer sexual practices, not least because super-infection has the potential to narrow treatment options.

AIDS Treatment Update spoke to Edward King (EK), Site Editor of HIV & AIDS Medscape, Phil Anderson (PA), Positiveline Co-ordinator at Body Positive, and Dr Duncan Churchill (DC), Consultant at Brighton Healthcare NHS Trust, about their interpretations of these data and their significance both for HIV-positive people – in particular gay men, who were the subject of these two reports; and for HIV prevention work.

ATU: These data concerning oral transmission have been interpreted by some as the first real evidence we have about the potential risks associated with oral sex. What do you think is the real significance of these data?

EK: This isn't the first real evidence – there have been previous reports exploring the likely transmission risk associated with oral sex through statistical modelling of data from cohort studies. But the study has certainly focused attention on the fact that oral sex, while a very low risk activity, is not entirely safe. The high frequency of unprotected oral sex among gay men means that even a very low risk activity should be expected to account for a significant number of cases over time, especially in a high prevalence setting such as San Francisco.

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PA: It's hard to make a judgement about the meaning of these findings because they haven't been terribly well reported. What counts as evidence about the riskiness of oral sex (or any activity for that matter) must be the ratio of people doing it to the number who get infected in this way. The statistic that seven people out of a hundred who are infected were infected by sucking someone off doesn't say anything about the comparative risks of oral sex versus other means of transmission unless we have figures showing the number of people doing it. I suspect that unprotected oral sex is a much more common practice than unprotected anal sex and so you can't say that oral sex is 7% risky and anal sex 93% risky.

DC: I think that the poster at San Francisco on oral sex that has attracted all the attention does not actually change things a great deal. I was impressed by the degree of rigour of the investigation, and am reasonably convinced by the conclusion, namely that a substantial minority of cases of HIV infection [in the study] were recently acquired via oral sex.

ATU: Are we not running the risk of scaremongering? After all, ejaculation occurred in six of the eight cases of documented transmission. Risk reduction strategies have always advised avoiding taking semen in the mouth.

EK: It's a shame that the analyses presented at the conference didn't focus on the co-factors that undoubtedly influence the risk of transmission through oral sex. The quantity of HIV-infected fluid clearly seems to be one issue, and it's noteworthy that about half of the seroconverters also had significant gum disease or ulcers. It's very likely that the level of HIV in semen is another important factor, albeit one that cannot readily be taken into account in individual prevention strategies.

PA: As a positive gay man I have my own personal boundaries about what I do and these 'findings' won't change that. If we can arrive at a figure which allows us to compare the riskiness of one activity versus another then that might be a different matter. So to place too much emphasis on these findings would indeed be scaremongering.

ATU: What are your feelings about the argument that if oral sex is depicted as risky then we may see an increase in unprotected fucking, if the borders between what is and what isn't safe become less clearly defined?

EK: I would argue that the most important implication is to ensure that gay men are

aware that oral sex is not entirely safe, so that they can make informed decisions about their safer sex practices. Many gay men will doubtless conclude that, given the low risk, eliminating unprotected receptive oral sex is not acceptable to them. Others may conclude that they do wish to use condoms for oral sex, to keep all risk to themselves or to their partners to a minimum. The most important issue is to enable gay men to make fully informed choices.

PA: I guess that the sad fact is that the borders between what's safe and what's not is not terribly well defined and may never be and we need to live with that. When training Positiveline volunteers I always say it is important that they present unprotected fucking as much more risky than anything else and not complicate the message too much by being equivocal about oral sex.

DC: I don't think that safer sex messages need to change dramatically; unprotected oral sex (particularly with ejaculation) was never a 'no risk situation'.

ATU: The super-infection case report which was presented in San Francisco illustrated that an HIV-positive man acquired multi-drug resistant virus after a sexual relationship with another positive man. Doesn't this represent our worst fears confirmed?

EK: The study is indeed bad news, especially for HIV-positive couples who may have felt that there was no significant risk in unprotected sex with each other – although at least it may potentially enable them to make better informed decisions about whether unprotected sex [with people of the same HIV status] is a risk they are prepared to take. It may also have implications for vaccine strategies founded on the hope that immune responses generated in response to HIV or its subunits might be protective against subsequent exposure.

DC: I think that this is a very important finding. There was a similar case presented at a meeting eighteen months ago. There must surely have been many other cases, yet it is hard proving super-infection has taken place. Campaigns on this specific issue need to be targeted at HIV-positive people.

ATU: Over fifteen years of prevention work have failed to significantly reduce annual transmission rates and researchers and prevention workers acknowledge that prevention campaigns that simply advocate using a condom every time with every partner are unrealistic. Is it time to re-assert the fear in prevention messages?

EDITOR'S NOTE
Whilst the discussion presented in this article refers primarily to the HIV epidemic amongst gay men, and to prevention strategies which target gay men, we note that information on the risk of HIV transmission through oral sex, and of HIV super-infection will also be relevant to people from other affected communities, and plan to return to this issue in future.

“The most important issue is to enable gay men to make fully informed choices.” – Ed King

EK: I would hope that rather than generating fear, these findings can be used more constructively to help positive, negative and untested people more accurately to assess the risks presented by HIV, and to make better-informed, more confident choices.

PA: I really don't think 're-asserting fear' is a good idea psychologically. Fear gets in the way of thinking. My experience of ads that play on fear is that I feel pissed off at being manipulated and avoid thinking about them. I ignore them so as to avoid feeling bad about myself. Campaigns which address real concerns of real people, which reassure that it is possible to do something that will make a difference, even if risk cannot be eliminated, and which therefore encourage people to feel in charge and powerful, will work much better. The "don't die of ignorance" approach was a significant mistake, not just because it didn't have much effect on people's behaviour, it also quickly became apparent that the "everyone is equally at risk" message was patently false. The long-term effect is that future safer sex messages which rely on shocking people appear inherently untrustworthy and manipulative. It is also divisive; anything that plays on untested or negative people's fears makes positive people into the feared object.

There has to be a way of acknowledging difference (especially the different stakes that positive, negative and untested people have in safer sex) but at the same time maintaining the sense that HIV is everybody's problem. Unless gay culture as a whole allows the reality of HIV into their consciousness regardless of status there is a massive disincentive for positive people to be open and up front about their status so as to be able to belong.

DC: Aside from the specific example of super-infection, I am not sure that the message of safer sex campaigns need to be changed. I agree that there are plenty of examples of the message not being received, or at least not leading to changes in behaviour sufficient enough to make a large dent in transmission rates.

ATU: Research has shown that up to 50% of gay men do not strictly 'follow the rules' of HIV prevention strategies like negotiated safety, and risk transmission by engaging in activity with individuals whose status they are not certain of. How do you think such strategies stand in light of these recent findings?

EK: In practice, I believe that individuals have devised their own safer sex strategies – some more reliable than others – since the start of the epidemic. The endorsement of negotiated safety in the early 1990s simply represented a belated acknowledgment by prevention workers of the potential validity of those strategies, and opened the door for education about their weaknesses too. These new findings don't invalidate those strategies, but they certainly should influence them, so the immediate task for prevention agencies is to maximise understanding of these issues among communities at risk.

PA: If by negotiated safety you mean that individuals negotiate each sexual encounter separately in the light of what they know about the other person rather than following a blanket rule to cover all situations, then new research findings, whatever they mean will not change that principle. However, this principle only works if there is a culture of openness and honesty about one's status.

Key conclusions:

- ◆ Oral sex is a 'safer' activity compared with unprotected fucking. New research confirms, however, that it may be an important mode of HIV transmission amongst gay men due to its relative frequency.
- ◆ Taking ejaculate into the mouth is associated with an increased likelihood of transmission.
- ◆ Ulcers, bleeding gums and sores in the mouth can also increase the likelihood of HIV transmission.
- ◆ A recent case report suggests that super-infection with drug resistant HIV does occur. Super-infection could reduce your treatment options, and may worsen the course of disease progression.
- ◆ Safer sexual practices can offer protection from super-infection.

REFERENCES

Both reports referred to in this article were presented at the 7th Conference on Retroviruses and Opportunistic Infections held in San Francisco in February. The abstract numbers are 473 and LB2, and they can be read on the web at www.retroconference.org

Drug interactions

New data underline the role of drug interactions in treatment failure

BY ROBERT FIELDHOUSE

The purpose of clinical trials is to assess the effects and safety of medications. Drugs are licensed at doses that are supposed to be high enough to fight infection and low enough to avoid causing too many unwanted effects. People living with HIV may have to take a range of medication on a daily or intermittent basis: antiretrovirals, drugs to fight or prevent infections as well as drugs to help deal with side-effects. Additionally, many individuals take over-the-counter medication for common ailments, as well as recreational drugs. As an increasing number of agents are integrated into everyday HIV management the potential for interaction between them becomes more common.

The amount of a drug that is absorbed into the body and is active against infection can depend upon a range of factors. Drug levels may vary from patient to patient, they can be affected by food or liquid intake, by whatever other medication is being taken at the same time, and by the use of alcohol and recreational drugs.

Since the range of medication being taken by an individual varies from time to time, it is impossible for a clinical trial to show, conclusively, how all medications commonly used by people with HIV are likely to interact with one another. Interaction studies tend to evaluate the effects of one drug on another so conclusions applicable to the commonly prescribed multi-drug combinations of today can be hard to draw. However, information about how specific drugs interact with one another can be used to predict the likelihood of potential interactions with other drugs.

In the February 12th, 2000 edition of *The Lancet*, researchers presented data on the risk of drug interactions with St John's Wort (hypericin) and the protease inhibitor indinavir. St John's Wort is a herbal remedy used to treat mild depression. When taken at the same time as indinavir, however, it was responsible for a reduction in indinavir peak levels by 57%, and in trough levels by 81%. Reductions of such magnitude could lead to the development of drug resistance and treatment failure.

Public perceptions of products such as St John's Wort tend to be that they are natural and cannot easily do harm, and their potential role in HIV treatment failure has never been fully explored. It is as yet unknown whether other natural products may cause similar effects but this is certainly an area that

requires further investigation. The cause of this particular interaction is thought to be the induction of the enzyme system known as cytochrome P450 by St John's Wort. This enzyme system is explained below.

TYPES OF DRUG INTERACTION

Drugs can interfere with each other's uptake in the gut, circulation in blood or uptake by cells. Antagonism means that one drug blocks or reduces the effect of another.

When two drugs work together against one target to produce a response that is greater than the individual effects of the two put together, this is known as synergism (1+1 = more than 2). When one drug boosts the effect of another by increasing levels in the blood, this is known as potentiation (a+b = more b than usual). This is the way in which ritonavir works when given with saquinavir or indinavir. Drugs can also interact in the body as they are processed, or metabolised.

HOW ARE DRUGS PROCESSED?

Drugs are broken down, absorbed and removed from the body through a range of chemical reactions and processes. Drugs are absorbed in the mouth, gullet (oesophagus), stomach and intestines and then passed to the liver before they are circulated to the rest of the body. Many drugs are taken out of the blood unchanged by the kidneys, and leave the body in urine. However some drugs require processing by the liver before they can be eliminated.

ABSORPTION

Some drugs may slow the digestive process and therefore slow absorption from the intestines. The opiates morphine and codeine are particularly known for this. Some drugs have specific requirements for absorption. For example, the current formulation of ddl is broken down by stomach acid and must therefore be taken on an empty stomach. It has been developed with a buffer that neutralises stomach acid and allows the drug to be absorbed. If drugs which lower stomach acidity are taken at the same time as ddl this will increase the amount of ddl that is absorbed and may potentially increase the likelihood of side-effects associated with the drug. Some drugs commonly used in HIV

ABT-378/r INTERACTION

Abbott Labs have warned that levels of their protease inhibitor, ABT-378/r are lowered when the drug is taken with efavirenz. The company says that people who have previously taken another protease inhibitor before starting ABT-378/r may need to increase their dose of this drug to four capsules twice daily if it is taken with efavirenz.

It is advisable to keep an up-to-date list of all medications that you are taking.

management like dapsone, ketoconazole and ciprofloxacin actually need stomach acid to be absorbed in beneficial amounts, and as a result they cannot be taken at the same time as ddl. The buffer in ddl also interferes with the absorption of indinavir, so ddl and indinavir should not be taken at the same time. In the near future, however, these problems will be solved by the availability of a new, enteric-coated formulation of ddl, which does not have the buffer.

THE ROLE OF THE KIDNEYS

The kidneys excrete many drugs unchanged in the urine. Few drugs interact in a way either to block, slow down, accelerate or induce elimination by the kidneys.

THE EFFECTS OF LIVER ENZYMES

Drugs are processed by the liver to de-toxify them and make them either more water or fat soluble for excretion in urine or faeces respectively. The liver uses substances found in the cells of the liver called cytochrome P450 enzymes or isozymes to break down drugs. Researchers have identified 23 different P450 enzymes. There are five main enzymes that are important in processing drugs. Due to genetic make-up, some people produce higher or lower than average amounts of specific P450 enzymes and, as a result, respond to treatments very differently.

A drug interaction may occur when two drugs that are broken down by the same enzyme are taken at the same time. Simply, there may not be enough of the enzyme to break down both the drugs at once, allowing one to reach unusually high levels in the body. It is also possible for individual drugs to cause a reduction or increase in the activity of a specific P450 enzyme leading to slower or faster metabolism of another drug being taken at the same time. This is what has been shown to happen when St John's Wort is taken with indinavir.

Researchers have identified which P450 enzymes are involved in breaking down specific drugs as well as which drugs induce (speed up) or inhibit (slow down) metabolism.

This information allows them to predict when an interaction between two drugs may occur. Identifying the way in which St John's Wort speeds up metabolism of indinavir has allowed researchers to predict how it will interact with other drugs that are metabolised by the same pathway.

A warning about the potential interaction between St John's Wort and protease inhibitors and NNRTIs has already been issued by the UK's Medicines Control Agency. They advise anyone on antiretroviral therapy who has started taking St John's Wort since their last viral load test to contact their doctor for a repeat test to see if it has had any negative effect on their viral load.

THERAPEUTIC INDEX

The term 'therapeutic index' refers to the ratio between the desired effect of a compound and any undesired effects. A narrow therapeutic index means that there is a relatively small difference between the amount of drug which must be taken in order for it to be effective, and the amount which is likely to cause side-effects. When drugs that have a narrow therapeutic index are given at the same time as potential P450 inhibitors, the effect can be to increase or decrease their levels to a serious or even life-threatening extent. Such agents should not, therefore, be used together.

Key conclusions:

- ◆ It is advisable to keep an up-to-date list of all medications that you are taking. It is important to include any vitamins, herbal remedies, health foods, over-the-counter medication and recreational drugs and bring this list along with you to your clinic appointment to show either your clinician or HIV pharmacist.
- ◆ When given new medication, always check with the pharmacist if any interactions are likely with your existing medication.
- ◆ It is important that you only take prescription medication that has been prescribed for you personally.
- ◆ If in doubt, it is always best to check with a pharmacist who has knowledge about antiretrovirals.

USEFUL WEBSITES

Space does not allow us to publish full information about all potential drug interactions that may affect people with HIV, but the following websites have comprehensive tables that you can view online and print:

www.hiv.medscape.com/druginteractions

www.hiv-druginteractions.org

www.tthivclinic.com/interactions.htm

www.projectinform.org

www.hivandhepatitis.com

LIKELY CANDIDATES FOR DRUG INTERACTIONS

P450 INHIBITORS:

Protease inhibitors
 NNRTIs
 Antifungals ending in -azole (e.g. ketoconazole, itraconazole, fluconazole)
 Macrolide antibiotics (e.g. azithromycin, erythromycin)
 H2 antagonists (e.g. cimetidine, ranitidine)

P450 INDUCERS:

Protease inhibitors
 NNRTIs
 Rifamycin antibiotics (e.g. rifampicin, rifabutin)
 Some anti-convulsants (e.g. phenytoin, carbamazepine)

DRUGS CLEARED BY THE KIDNEYS WITH NARROW THERAPEUTIC INDICES:

Adefovir
 Ganciclovir
 Foscarnet
 Aminoglycosides (e.g. gentamicin)

DRUGS METABOLISED BY THE LIVER WITH NARROW THERAPEUTIC INDICES:

Oral contraceptives
 Recreational drugs (e.g. ecstasy)
 Non-sedating anti-histamines (e.g. terfenadine)
 Long acting opiate analgesics (e.g. fentanyl)
 Proton pump inhibitors (e.g. omeprazole)
 Anti-arrhythmics (e.g. flecainide)
 Long acting benzodiazepines (e.g. diazepam, nitrazepam)
 Ergotamines and dihydroergotamine (e.g. *Cafergot*[™])
 Coumarin anticoagulants (e.g. warfarin)

DRUGS WITH SPECIFIC REQUIREMENTS FOR ABSORPTION:

ddl
 Ketoconazole
 Fluoroquinolones (e.g. ciprofloxacin)

Pregnancy news

According to a recent report, drug resistance testing performed on fifteen pregnant women who received a single dose of nevirapine at the onset of labour detected resistance to the drug in three cases.

The women were enrolled in a pilot study run in Ugandan women prior to the larger HIVNET 012 trial. Last year, the latter reported a significant reduction in mother-to-child HIV transmission in women and infants receiving nevirapine prophylaxis compared to a very short course of AZT.

Genotypic sequencing was performed before nevirapine was given, and at six weeks after delivery. Though no mutations were detected pre-therapy, K103N, an NNRTI resistance signature mutation which confers resistance to nevirapine, efavirenz and delavirdine, was found in three of the fifteen women following treatment. Sampling at six weeks after delivery may have underestimated the frequency of resistance mutations, as some resistant sub-populations may have 'disappeared' from circulation by this point.

Three of fifteen women genotyped transmitted HIV to their infants despite the use of nevirapine. Of the three women in whom K103N was detected, one transmitted HIV infection; the remaining two did not.

These findings sparked a level of concern amongst doctors caring for HIV-positive women in the developed world, where a large international trial, ACTG 316, is currently evaluating the use of a single dose of nevirapine in pregnant women receiving other antiretrovirals. Where treatment has failed to reduce maternal viral load to undetectable levels, it seems a single dose of nevirapine may result in NNRTI resistance in some cases, narrowing options for future therapy. The potential for selection of nevirapine resistance mutations where viral load is fully suppressed ought to be lower. Women considering their use of anti-HIV drugs in pregnancy may need to weigh the risk that using nevirapine in this way may limit their future options against the potential benefit in reduced risk of transmission.

References: Eshleman SH et al. 7th Conference on Retroviruses and Opportunistic Infections, San Francisco, abstract 658, 2000; Guay LA et al. *Lancet* 354(9181):795-802, 1999.

SOURCE
 This table is reproduced, with permission, from *Managing Drug-Drug Interactions in HIV Disease*, by Flexner and Piscitelli. This review is published by Medscape and was recently updated. It is available at www.hiv.medscape.com/druginteractions.

New UK trials

ERA (Evaluation of Resistance Assays) is a comparison of different resistance testing strategies used when people change regimens. Group A is for people who have not taken many anti-HIV drugs in the past. People in this group will be randomly assigned to either select their new drugs without a resistance test or to receive a genotypic resistance test at the beginning of the study.

Group B is for more drug-experienced people, for whom an effective three drug regimen cannot be selected. All participants in this group will receive a genotypic test at the beginning of the study and whenever their treatment might need changing. They will also be randomly allocated to receive or not receive a phenotypic test. This means there will be four arms in this part of the study:

- ◆ genotypic test but no phenotypic test
- ◆ phenotypic test but no genotypic test
- ◆ phenotypic test and genotypic test
- ◆ no resistance test.

To join the trial, you must be receiving antiretroviral therapy with evidence of virological failure, and have a viral load over 2,000 copies. ERA is recruiting at sites across the UK.

Tenofovir DF, (formerly known as PMPA), is an experimental nucleotide analogue in development by Gilead Sciences, who are also responsible for the similar drug, adefovir. Study GS-99-907 is designed for people who are currently receiving stable antiretroviral therapy with a maximum of four licensed drugs, with viral rebound between 400 and 10,000 copies. Participants will be randomised to receive a once daily dose of tenofovir, or a placebo, for 24 weeks. After this time, everyone in the study will receive tenofovir for 24 weeks. After 48 weeks, all participants will be offered continued access to tenofovir. This study is recruiting at sites in Brighton and London.

BMS-232632 is a new protease inhibitor from Bristol-Myers Squibb. Protocol A1424-009 is currently recruiting 75 people who have been taking an antiretroviral regimen containing a protease inhibitor for at least twelve weeks, and have viral load between 2,000 and 10,000 copies. Participants will receive either:

- ◆ BMS-232632 (400mg once a day) plus

saquinavir (1200mg once a day) plus two of either ddI, 3TC, d4T or AZT

- ◆ BMS-232632 (600mg once a day) plus saquinavir (1200mg once a day) plus two of either ddI, 3TC, d4T or AZT
- ◆ ritonavir plus saquinavir twice a day plus two of either ddI, 3TC, d4T or AZT.

Safety and activity of the regimens will be assessed after four weeks of therapy. Any dosing group found to be inferior in antiviral activity will then be dropped. In stage 2, enrolment will re-open and 300 more participants will be divided into the remaining treatment groups. The trial will last for 48 weeks. Participants must not have prior exposure to at least one of the following nucleoside combinations: d4T/ddI, d4T/3TC, AZT/3TC, ddI/AZT. This study is recruiting at the Chelsea and Westminster and at the Royal Free Hospitals.

SU5416 is a new drug believed to have some effect on the growth of AIDS-related Kaposi's Sarcoma cells and tumour tissue, and works by slowing down the development of new blood vessels, thus preventing lesion growth. Study SE5416-301 aims to evaluate the anti-tumour effect of SU5416, and its safety and tolerability in people who have Kaposi's Sarcoma that has not responded to at least two standard therapies, and who have been on stable antiretroviral therapy for at least two weeks. All participants will receive the same fixed dosage of SU5416 by intravenous infusion twice weekly over a period of eight weeks (two cycles of four weeks), with an interim assessment after four weeks. Any patient responding well to treatment will be permitted to continue receiving treatment in further four weeks cycles, up to a maximum of one year in all. This study is recruiting at the Chelsea and Westminster Hospital.

2NN is a study designed to compare the efficacy of **nevirapine** and **efavirenz**, taken in combination with d4T and 3TC, in naive patients with viral load above 5,000 copies. Participants will receive d4T/3TC with either nevirapine or efavirenz, or with both drugs. 2NN is recruiting at sites in Brighton, London and Manchester. The study will last 48 weeks and treatment is open-label.

Full details of each of these trials, including contact information for participating sites is available on the NAM/BHIVA website aidsmap.com.

NAM FORUM

Salvage Therapy is the subject of the Information Forum to be held on April 17th.

The speaker is Dr Mike Youle, and the venue is the 4th floor room, University of London Union, Malet Street, London W1.

The forum is free, runs from 7-9pm and a sign language interpreter is available.

NAM REVIEW PANEL

NAM is looking to recruit a small group of HIV-positive people who would be willing to volunteer their views on our range of resources prior to publication. Your comments will help us ensure that our products are relevant and useful to the wider community of people affected by HIV. If you are interested in becoming involved, please contact Anna Poppa via the NAM office, or by email to anna@nam.org.uk.

GLOSSARY OF TERMS

antiretroviral Something that attacks retroviruses such as HIV

CD4 Molecule on the surface of some cells onto which HIV binds. CD4 cell count roughly reflects the state of the immune system

clinical trial A research study with people, usually to find out how well a new drug or treatment works in people and how safe it is

cross resistance When resistance to one drug reduces the virological response to subsequent treatment with another drug which has not been taken before

enzyme A protein which speeds up a chemical reaction

genotype The genetic make-up of an organism

intravenous Injected into a vein

lesion Any abnormal change in body tissue caused by disease or injury.

metabolism The mechanisms which sustain life, turning sugar and fat into energy

mutation A single change in gene sequence

NNRTI Non-nucleoside reverse transcriptase inhibitors: anti-HIV drugs that include nevirapine, delavirdine, and efavirenz

NRTI Nucleoside analogue reverse transcriptase inhibitors: anti-HIV drugs that include AZT, ddI, ddC, 3TC and d4T

phenotype Trait or behaviour which results

from a particular genotype

placebo A pill or liquid that looks and tastes exactly like a real drug, but contains no active substance

prophylaxis Taking a drug to prevent illness

protease An enzyme that HIV uses to break up large viral proteins into smaller ones

protease inhibitor Anti-HIV drugs which target the protease enzyme, e.g. saquinavir, ritonavir, indinavir, nelfinavir

regimen Drug or treatment combination

resistance A drug-resistant HIV strain is less susceptible to the effects of one or more anti-HIV drugs because of its genetic make-up

reverse transcriptase An enzyme which converts genetic material from RNA into DNA, an essential step in the lifecycle of HIV

strain A variant characterised by a specific genotype

tumour Uncontrolled new tissue growth, in which cells multiply rapidly

undetectable viral load A level of viral load that is too low to be picked up by the particular viral load test used

viral load The amount of virus in a sample. HIV viral load indicates the rate at which HIV is reproducing in the body

virologic response Effect of treatment on viral load

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ANY QUESTIONS?

The following national agencies, all based in London, offer one-to-one advice and information about treatment options, in person or over the telephone:

◆ AIDS Treatment Project

Phoneline: 0845 9470047
Mon & Wed 3pm - 9pm, Tue 3pm - 6pm
All calls charged at local rates.

◆ Body Positive

Treatment Advice: Tue & Wed 12pm - 5.30pm
Call Anthony on 020 7287 8010 to make an appointment.

◆ The Terrence Higgins Trust

Helpline: 020 7242 1010 Daily 12noon - 10pm
Treatment Support: Call the Treatments Team on 020 7831 0330 for an appointment.

NAM recommends readers to seek treatment advice from more than one source, and to discuss all your decisions with your doctor.

The publishers have taken all such care as they consider reasonable in preparing this newsletter. But they will not be held responsible for any inaccuracies or mis-statements of fact contained herein. Inclusion in this newsletter of information on any drug or clinical trial in no way represents an endorsement of that drug or trial. This newsletter should always be used in conjunction with professional medical advice.

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