# LETTERS



## Two antiretroviral drugs likely to be confused

Medications for the treatment of human immunodeficiency virus (HIV) infection continue to be developed and placed on the market at a rapid pace. Many of these products receive FDA approval under an accelerated process and therefore may arrive at practice sites before staff members can familiarize themselves with brand and generic names. This lack of product knowledge can easily translate into medication errors.

The names of many antiretroviral agents look alike when written and sound alike when spoken.[1] Contributing to the confusion are caregivers who refer to these medications by abbreviations instead of actual drug names.[2]

Viramune (nevirapine, Roxane Laboratories) and Viracept (nelfinavir mesylate, Agouron Pharmaceuticals) are used to treat HIV infection. Although their names are similar, these medications differ in important ways. Nevirapine is a nonnucleoside reverse-transcriptase inhibitor that binds directly to reverse transcriptase, inhibiting transcription of viral RNA into DNA. Nelfinavir is a protease inhibitor that prevents immature HIV from budding from the cell membrane and producing mature viral particles.[3]

**Orthographic Similarities between Two Antiretroviral Drugs**

| Drug Names | Bigram Similarity | Trigram Similarity | Levenshtein Distance |
|---|---|---|---|
| Viramune and Viracept | 0.75 | 0.50 | 5 |
| Nevirapine and nelfinavir | 0.80 | 0.14 | 6 |

The U.S. panel of the International AIDS Society recommends using one of two regimens to minimize the development of resistant virions during initial treatment of patients with HIV infection. One regimen combines two nucleoside reverse-transcriptase inhibitors with a protease inhibitor; the other regimen uses two nucleoside reverse-transcriptase inhibitors and a nonnucleoside reverse-transcriptase inhibitor.[4] If nelfinavir were the protease inhibitor prescribed in the first regimen, and nevirapine were inadvertently dispensed on refill, the patient would inappropriately stop protease inhibitor therapy. This could lead to the development of resistance to other HIV protease inhibitors, for cross-resistance among these agents is known to occur.[5] Correcting the error and resuming a protease inhibitor is unlikely to yield sustained suppression of viral replication.

On the other hand, if nevirapine were erroneously dispensed during the ini-

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tial fill and the error went undetected during subsequent refills, the benefits of early intervention with a protease inhibitor would be lost.

The orthographic similarity between the generic names nevirapine and nelfinavir and their brand names Viramune and Viracept may be analyzed by bigram and trigram similarities and Levenshtein distance. These methods are useful in determining the potential for errors with medications whose names look alike and sound alike. Bigram and trigram pair scores between 0.5 and 0.99 indicate an increasing likelihood that names will be confused for one another. The bigram and trigram values in the table predict a strong likelihood of product mix-up. The Levenshtein values also indicate a high probability of error. A Levenshtein score of 6 is associated with a high likelihood of confusion between names.[6]

The National Coordinating Council for Medication Error Reporting and Prevention recognizes circumstances likely to produce an error as its category A for error classification. The facts about Viramune and Viracept fit this category well. In this instance, recognition of the potential for error can guide practitioners toward appropriate safeguards in ordering and dispensing these medications.[7]


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