A nurse-led adherence intervention for HIV works and saves money

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In Canada and other high-income countries today, several complete HIV treatment regimens (ART) are available in one pill that can be taken once daily. Furthermore, modern ART is generally well tolerated.

Studies have found that the initiation of ART usually has a considerable beneficial effect on laboratory measures of a person’s health. This effect of ART is so profound that it has a long-term benefit: Specifically, researchers increasingly expect that a young adult who is infected with HIV today and diagnosed shortly thereafter and who initiates ART and takes it every day (adherence) and who does not have other health issues—including substance use; smoking; co-infection with hepatitis-causing viruses; unrecognized, untreated or poorly managed mental health conditions—will likely survive into his or her senior years.

Adherence

A team of researchers in the Netherlands has been studying adherence for many years. Their latest study has shown that a nurse-led intervention called AIMS (Adherence Improving self-Management Strategy) has had a measurable and significant effect on improving treatment success rates. Participants who received AIMS were significantly more likely to have lower viral loads and less likely to develop virological failure compared to people who did not receive AIMS.

An economic analysis that accompanied the present AIMS study suggests that if AIMS were to be widely implemented, health systems would save millions of dollars while the number of years people with HIV would live in good health would increase. Authorities in the Netherlands are currently considering implementation of AIMS.

AIMS overview

AIMS was initially developed in 2003 based on data from previous studies, research about people’s behaviour and ideas from healthcare providers and patients.

A key aspect of AIMS is that it is data driven. It uses specialized pill bottles with covers or caps (called MEMS-Caps) that are capable of capturing information about the date and time the bottles were opened. According to Dutch researchers, AIMS is a “one-on-one behavioural intervention that incorporates adherence feedback from MEMS-Caps and [as a program] is designed to fit into routine clinical visits.” Previous studies of AIMS have found it to be effective and acceptable to patients in the short-term.

AIMS, which is meant to be delivered by nurses, can be used for people new to ART and for treatment-experienced patients. The approach to these two groups of patients differs mainly in the type of topics discussed at the initial clinic visit.

AIMS in depth

Here is an example of how AIMS was included in the care of treatment-experienced participants.

For between one and two months prior to their first visit associated with the full series of AIMS interventions, treatment-experienced participants were given their ART via MEMS-Cap-enabled bottles and were taught how to use them. Data captured during this time were then used to generate charts and graphs showing participants’
adherence patterns and to develop subsequent discussions about maintaining or improving their adherence. These discussions were led by nurses who encouraged participants to speak about their “desired adherence level.” Using the charts and graphs generated from MEMS-Caps, nurses helped participants uncover periods of non-adherence and the reasons for this as well as ways to improve adherence. Participants were also questioned about their feelings about adherence and their ability to achieve their adherence goals. If participants did not have a high level of confidence in their ability to adhere, the nurses “explored whether important adherence barriers had been unaddressed or if adherence goals should be approached [in smaller, shorter steps].”

During subsequent clinic visits, MEMS-Caps reports were used in nurse-led sessions to either help improve or maintain adherence. If participants continued to have problems with adherence, more frequent visits to see the nurse were an option.

**Study details**

The average profile of participants upon entering the study was as follows:

- age – 44 years
- 84% men, 16% women
- although the majority of participants were white, a substantial minority were from parts of sub-Saharan Africa and the Caribbean
- 63% of male participants were gay or bisexual
- CD4+ cell counts were distributed as follows – among people who were about to initiate ART, CD4+ counts were between 350 and 430 cells/mm$^3$; among treatment-experienced participants, CD4+ counts were greater than 500 cells/mm$^3$
- viral loads were distributed as follows – among people who were about to initiate ART, viral loads were between 20,000 and 63,000 copies/mL; among treatment-experienced participants, 34% had a detectable viral load, usually around 65 copies/mL (this may seem low but detectable viral loads, if they persist, can gradually degrade the effectiveness of treatment, leading to the development of drug-resistant HIV, treatment failure and reduced future treatment options)

Participants were randomly assigned to the study interventions—AIMS or treatment as usual. The distribution of participants whose data were used to analyse the study results was as follows:

- AIMS – 109 participants
- treatment as usual – 112 participants

Participants were monitored for about 15 months.

**Results—Time spent at clinic appointments**

To help calculate the future costs of AIMS, it is important to know how much time was spent by the nurses involved in the study. At each clinic visit the average time spent was as follows:

- usual care activities and AIMS – 29 minutes
- usual care activities (treatment as usual) – 19 minutes

**Changes in viral load and CD4+ cell counts**

Across three points in time—months five, 10 and 15 of the study—viral load was 1.26-fold greater in participants in the treatment-as-usual group vs. the AIMS group. These results were the same regardless of which study nurse delivered care.

Furthermore, the risk of virological failure was 61% greater for participants in the treatment-as-usual group compared to people in the AIMS group.

Over the course of the study, CD4+ cell counts increased in both groups, but was significantly higher at month 15 among participants who received AIMS compared to those who received treatment as usual.

The study’s results were similar whether participants were new to treatment or experienced.
Bear in mind

1. According to the study team, this is the first randomized controlled clinical trial of an adherence intervention that is “associated with a meaningful effect on viral load as well as cost-effectiveness.”
2. The effectiveness of AIMS was not different in different ethno-racial groups.
3. An economic analysis of AIMS suggests that if it were implemented among 10,000 patients and continued for 18 months, health systems would save almost €6 million (about $CAN 8.7 million, or $US 6.5 million).

Room for improvement

MEMS-Caps bottles have been described by some researchers and patients as “bulky,” causing concern amongst some patients about their ability to carry their medication around discretely. Most of the potential participants who refused to enter the present study did so because of these large bottles.

However, according to the researchers, more “user-friendly” bottles that can electronically monitor and record medication use should become available for studies later this year. Such bottles should make implementation of AIMS less of a barrier for some patients.

Adherence and getting to 90-90-90

Initiating ART soon after diagnosis has a profound personal benefit (improved health). What’s more, ART also has a huge societal benefit (reduced spread of HIV). Clinical trials have found that people who take ART and who achieve and maintain an undetectable viral load do not pass on HIV to their sexual partners. These twin benefits of ART have inspired the Joint United Nations Programme on AIDS (UNAIDS) to set measurable goals to which cities, regions and countries can aspire in their quest to improve health and reduce the spread of HIV. UNAIDS encourages health authorities to try to achieve these goals, which go by the shorthand 90-90-90, by the year 2020:

- 90% of people living with HIV are aware of their infection
- 90% of people diagnosed with HIV are taking ART
- 90% of people taking ART have an undetectable viral load

If all of these goals are met by 2020, 73% of HIV-positive people in a city, region or country would have an undetectable viral load, and therefore the risk of HIV transmission would be greatly reduced.

Researchers at the University of Washington in Seattle who have reviewed the Dutch research have noted that adherence “remains the primary obstacle to achieving the best outcome for patients receiving [ART].”

As countries and regions race to try to achieve the final 90 (90% of ART users will have an undetectable viral load) by 2020, programs such as AIMS could help play a pivotal role in ensuring high rates of success.

Resources

ART and survival

B.C. researchers explore life expectancy among HIV-positive people - CATIE News

Impressive gains in survival for older people with HIV but still less than general population - CATIE News

What reduces survival 10 years after starting ART in North America and Europe? - TreatmentUpdate 217

Challenges in achieving a longer life - TreatmentUpdate 214

Longer life expectancy for HIV-positive people in North America - TreatmentUpdate 200

Exploring factors linked to longer survival among ART users - TreatmentUpdate 200

Long-term HIV infection and health-related quality of life - CATIE News

Swiss researchers investigate drug use and its impact on health and survival - CATIE News

About 90-90-90
REFERENCES:


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Decisions about particular medical treatments should always be made in consultation with a qualified medical practitioner knowledgeable about HIV- and hepatitis C-related illness and the treatments in question.

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