ADHERENCE IMPROVING SELF-MANAGEMENT STRATEGY (AIMS)

Good Evidence – Medication Adherence

INTERVENTION DESCRIPTION

Goals of Intervention
- Improve HIV viral suppression

Target Population
- HIV clinic patients who are antiretroviral treatment-experienced or treatment naïve

Brief Description

Adherence Improving self-Management Strategy (AIMS) is a nurse-delivered, individual-level intervention designed to increase medication adherence among HIV clinic patients in the Netherlands. Nurses receive three 6-hour training sessions on the AIMS intervention, and a 1.5-hour booster training session after seeing at least 2 patients. The intervention is delivered during routine clinic visits. Medication adherence data are collected using a Medication Event Monitoring System (MEMS)-cap for 4 to 8 weeks prior to the first AIMS intervention visit. Nurses utilize MEMS cap data to provide adherence feedback and to tailor the intervention to meet the needs and abilities of each patient. Patients are guided on identifying and achieving adherence goals and developing coping plans (e.g., identify patterns, causes, solutions) for periods of non-adherence. The aim of the intervention is for patients to achieve their desired level of adherence for the first 5 months, behavioral maintenance for the next 5 months, and follow-up for another 5 months. Patients are seen more frequently by the nurses if they experience adherence difficulties.

Theoretical Basis
- Theory of Planned Behavior
- Control/Self-Regulation Theory
- Self-Determination Theory

Intervention Duration
- On-going

Intervention Setting
- HIV clinic

Deliverer
- Nurse

Delivery Methods
- Corrective feedback
- Coping plans
- Discussion
- Personalized adherence plans
- Problem-solving

Structural Components
There are no structural components reported for this study.

INTERVENTION PACKAGE INFORMATION

An intervention package is not available at this time. Please contact **Marijn de Bruin**, Radboud Universitair Medisch Centrum, Radboud Institute for Health Sciences, IQ Healthcare, Geert Grooteplein 21, Postbox 9101, 6500 HB Nijmegen, The Netherlands.

Email: marijn.debruin@radboudumc.nl for details on intervention materials.

EVALUATION STUDY AND RESULTS

Study Location
The original evaluation study was conducted in The Netherlands between 2011 and 2014.

Key Intervention Effects
- Reduced viral load

Recruitment Settings
HIV clinics

Eligibility Criteria
HIV clinic patients were eligible if they were age 18 years or older, were either treatment-experienced (i.e., ≥ 9 months on combination ART and at risk of viral rebound) or treatment-naïve (i.e., initiating first combination of ART). At risk of viral rebound was determined based on having a least one detectable viral load during the previous 3 years and suboptimal adherence during the 2 months of baseline MEMS monitoring (<100% adherence for once-daily regimens, and ≤ 95% for twice-daily regimens).

Study Sample
The analytic sample of 221 HIV clinic patients is characterized by the following:
- *84% male, 16% female*
- *Mean age of 44 years (SD = 10.9)*
- *49% of patients were treatment-experienced; 51% were treatment-naïve*
- *34% of treatment-experienced patients had detectable viral load (>40 copies per mL)*

Assignment Method
HIV clinic patients (N = 224) were randomly assigned to 1 of 2 groups: AIMS intervention (n = 111) or treatment as usual comparison (n = 113).

Comparison
Participants in the treatment as usual comparison group received a range of common adherence intervention strategies, which included discussion with the nurse or physician about medication instructions, the best time to take medication, risk and benefits, adherence problems, and management of side effects. Patients also

received an information leaflet and a telephone number to call in case of occurrence of side-effects or difficulties with adherence.

Relevant Outcomes Measured

- Viral load (defined as log_{10}-transformed plasma viral load) was measured at 5, 10, and 15 months post-initiation of intervention and was assessed as undetectable (<40 copies per mL) or detectable.
  - Viral load was also assessed as treatment failure (e.g., having a detectable viral load on two consecutive follow-up assessments)

Participant Retention

- AIMS Intervention
  - 98.2% retained at 5 months post-initiation of intervention
  - 97.3% retained at 10 months post-initiation of intervention
  - 94.6% retained at 15 months post-initiation of intervention

- Treatment As Usual Comparison
  - 99.1% retained at 5 months post-initiation of intervention
  - 97.3% retained at 10 months post-initiation of intervention
  - 95.6% retained at 15 months post-initiation of intervention

Significant Findings on Relevant Outcomes

- Across the three assessment time points, log viral load was significantly higher among the treatment as usual comparison participants than AIMS intervention participants, adjusted for baseline viral load, treatment experience, and ethnic group (Estimated Marginal Means: 44.5 copies per mL vs 35.4 copies per mL; Mean difference = 1.26; 95% CI = 1.04—1.52; p = 0.012). Treatment as usual comparison participants also had higher odds of treatment failure than AIMS intervention participants (OR = 2.99, 95% CI = 1.27—7.38; p = 0.012), with 22.9% of treatment-as-usual and 9.0% of AIMS patients experiencing treatment failure (a 61% reduction).

Considerations

- This study did not meet best-evidence criteria because there was no statistical analysis conducted for adherence, due to substantial differences between the study arms in the use of MEMS monitoring after randomization (e.g., 91% of treatment-naïve participants assigned to AIMS intervention vs 54% assigned to treatment as usual). Patients in both groups were permitted to use their own medication bottles over MEMS-caps if preferred.
- There were no significant positive intervention effects on detectable viral load across the three assessment time points (OR = 1.89; 95% CI = 0.98 – 3.65; p=0.056).
- At 15 months post-initiation of intervention, but not month 5 and 10, there was a significant increase in CD4 cell counts among AIMS intervention participants, compared to treatment as usual comparison participants (Estimated Marginal Means: 597.8 cells per µL vs 558.4 cells per µL; Mean difference = 39.39 cells per µL; 95% CI=0.10—78.67).
- A Markov model was developed to assess the cost-effectiveness of the AIMS intervention on lifetime societal costs (e.g., healthcare costs, productivity loss, HIV transmission costs, and intervention cost) per quality-adjusted life-years (QALYs). Based on the base case model results, the AIMS intervention was cost-effective, as it reduced lifetime societal costs by €592 per patient (approximately $685 per patient) and

increased QALYs by 0.034 per patient. Results were also similar in the additional cost-effectiveness scenarios, as well as in the sensitivity analyses with a healthcare perspective and a 10-year time horizon.

- The AIMS intervention has been adapted to include a ½ day (4 hours) of online self-study, and 1 day (8 hours) of group training.*
- The AIMS intervention was pilot-tested (de Bruin et al., 2005) among 26 treatment-experienced patients in a within-subject comparison design.
    - There were significant increases in the adherence measures from 2 months pre-AIMS intervention to 3 months during the AIMS intervention; specifically:
        - Timing compliance (i.e., percentage of doses consumed within 10-14 hours for drugs taken twice daily, or 20-28 hours for once-daily regimens) ($Z = -2.1$, $p<0.05$)
        - Taking compliance (i.e., percentage of doses taken) ($Z= -2.8$, $p<0.01$)
        - Dosing compliance (i.e., percentage of days with correct amount of intakes) ($Z = -2.1$, $p<0.05$)
    - This finding does not meet PRS Best or Good Evidence criteria because of the within-subject comparison design.
- The AIMS intervention was also previously tested in a 9-month randomized controlled trial design among 133 treatment-experienced patients in a single HIV clinic (de Bruin et al., 2010). Adherence and viral load were measured at baseline, immediate post-intervention, and 4 months post-intervention.
    - This evaluation found a significant effect on timing adherence among AIMS intervention participants compared to participants assigned to the treatment as usual comparison (mean difference = 7.40, 95% CI = 3.50—11.30, $p<0.001$).
    - There was a significant effect on timing adherence among patients with <95% baseline adherence (mean difference = 15.20, 95% CI = 8.42—21.98, $p<0.001$).
    - There was a significant effect on taking adherence among patients receiving the full AIMS intervention compared to participants assigned to the treatment as usual comparison (mean difference = 6.51, 95% CI = 3.35—9.68, $p<0.001$).
    - The evaluation found that AIMS intervention participants had a significantly higher chance of being undetectable at immediate-post intervention compared to treatment as usual comparison participants (OR=2.96, 95% CI=1.00-8.74, $p<0.05$).
    - This study did not meet criteria for evaluation in the PRS Medication Adherence Chapter because PRS was not evaluating international interventions for medication adherence in 2010.

Funding
Netherlands Organisation for Health Research and Development (grant number 171002208)

***Information obtained from author**

REFERENCES AND CONTACT INFORMATION

de Bruin, M., Hospers, H. J., van den Borne, H. W., Kok, G., & Prins, J.M. (2005). Theory- and evidence-based intervention to improve adherence to antiretroviral therapy among HIV-infected patients in the Netherlands: A pilot study. *AIDS Patient Care STDS*, *19*(6), 384-394.

de Bruin, M., Hospers, H. J., van Breukelen, G. J., Kok, G., Koevoets, W. M., & Prins, J. M. (2010). Electronic monitoring-based counseling to enhance adherence among HIV-infected patients: A randomized controlled trial. *Health Psychology*, *29*(4), 421-428.

de Bruin, M., Oberjé, E. J., Viechtbauer, W., Nobel, H. E., Hiligsmann, M., van Nieuwkoop, C., … Prins, J. M. (2017). Effectiveness and cost-effectiveness of a nurse-delivered intervention to improve adherence to treatment for HIV: A pragmatic, multicentre, open-label, randomised clinical trial. *Lancet Infectious Disease, 17,* 595-604.

Researcher: **Marijn de Bruin, PhD**
Radboud Universitair Medisch Centrum
Radboud Institute for Health Sciences
IQ Healthcare
Geert Grooteplein 21
Postbox 9101, 6500 HB Nijmegen
The Netherlands

Email: marijn.debruin@radboudumc.nl