**ViiV Healthcare**

# COST-UTILITY ANALYSIS OF LONG-ACTING CABOTEGRAVIR + RILPIVIRINE FOR THE TREATMENT OF HIV INFECTION IN THE UNITED KINGDOM

P030

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## Introduction

- Antiretroviral therapy (ART) has enabled people living with HIV (PLHIV), if treated and appropriately managed, to have a life expectancy near to that of the general population[1]
- To effectively maintain viral suppression, lifetime adherence to daily dosing of all currently available oral ART is required[2,3]
- Poor adherence has been demonstrated to be a large contributor to virologic failure, drug resistance, HIV progression, and increased hospitalization, mortality, and associated disease-management costs[4,5]
- Factors contributing to suboptimal adherence to daily oral dosing may be medical (eg, malabsorption, dysphagia, adverse events), emotional (eg, fear of disclosure, daily reminder of HIV), or practical in nature (eg, lifestyle, employment)[6-9]
- Cabotegravir + rilpivirine long-acting (CAB LA+RPV LA) is the first ART administered via intramuscular injection either every month or every 2 months (which is preferred by patients) by a healthcare professional
- Because an injection is administered every 2 months,[10] CAB LA+RPV LA removes the burden of daily oral dosing of ART and may improve adherence, quality of life, and clinical outcomes in PHLIV who experience the above-mentioned issues with oral ART
- Therefore, it is important to understand the potential impact of an LA injectable on adherence and viral transmission rates in PLHIV
- We evaluated the cost effectiveness (costs and quality-adjusted life years [QALYs]) of CAB LA+RPV LA vs standard of care (SoC) daily oral ART

## Methods

- A previously published Markov cohort state-transition model was adapted to account for adherence and its subsequent impact on viral transmission[11-13]
- Efficacy was assumed to be equal between comparators in line with the results of a noninferiority trial and confirmed via an indirect treatment comparison
- The relationship between adherence and suppression is as described by Ross et al[14] such that, as adherence decreases, viral suppression is expected to decrease
- Health states in the model were defined by viral load and CD4 cell count
- Because CAB LA+RPV LA removes the need for adherence to daily dosing, its effectiveness in clinical practice was assumed to be similar to clinical trial settings
  - Real-world adherence estimates from the literature were applied to the SoC arm (5%-25% reduction from optimal levels observed in clinical trials[15-17]); costs were assumed to remain the same (ie, patients fill prescriptions but do not adhere completely to the regimen)
- Health state utility values were assigned by CD4 cell count category[18]
- A UK National Health Service costing perspective was adopted with an annual discount rate of 3.5% for costs and utility
- Drug acquisition costs assumed price parity based on the average cost of the most used 3 integrase inhibitor single-tablet regimens

### Figure 1. Model Flow Diagram
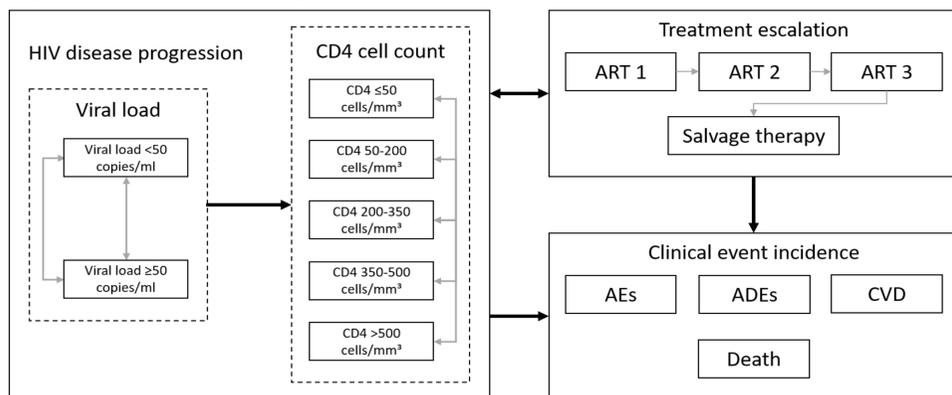


ADE, AIDS-defining event; CVD, cardiovascular disease.

## Results

- All scenarios show health outcome gains, demonstrated by an increase in QALYs, when patients receive CAB LA+RPV LA vs SoC in addition to total cost savings; this results in a dominant, incremental cost-effectiveness ratio (ICER) for CAB LA+RPV LA over SoC
- These results indicate that, as adherence is reduced from 5% to 25% from optimal clinical trial levels, it is expected that 53 to 286 years per 1000 patients in the equivalent of perfect health could be gained when patients receive CAB LA+RPV LA vs SoC when transmission is considered (Table 1; Figure 2B)

### Table 1. CAB LA+RPV LA vs SoC: Varying Real-World Adherence (Lifetime Results per 1000 Patients)

| Reduction in adherence for SoC from optimal clinical trial levels | Incremental cost, £ | Incremental QALYs | Incremental costs (incl. impact of transmissions), £ | Incremental QALYs (incl. impact of transmissions) | Incremental onward transmissions |
|---|---|---|---|---|---|
| 5% reduction in adherence | −4,215,924 | 43 | −5,176,123 | 53 | −2 |
| 10% reduction in adherence | −8,546,761 | 86 | −10,572,999 | 107 | −4 |
| 15% reduction in adherence | −12,584,576 | 128 | −15,816,196 | 163 | −6 |
| 20% reduction in adherence | −16,397,327 | 173 | −21,006,481 | 222 | −8 |
| 25% reduction in adherence | −20,018,474 | 220 | −26,211,872 | 286 | −11 |

QALY, quality-adjusted life year; SoC, standard of care.

- Where onward transmission is not considered in the model, treatment with CAB LA+RPV LA is expected to result in 43 to 220 years gained per 1000 patients, because adherence is reduced from 5% to 25% (Table 1; Figure 2B)
- Therefore, treatment with CAB LA+RPV LA is always estimated to be associated with positive health outcomes
- Depending on the reduction from optimal adherence levels applied to daily oral dosing, the approach described led to between 2 and 11 HIV cases averted per 1000 patients (Table 1; Figure 2A), with lifetime cost savings, driven primarily by the cost of salvage therapy (Table 2) of between £5.2 million and £26.2 million vs SoC (Table 1; Figure 2C)

### Figure 2. Relationship Between Adherence and (A) Additional Cases Averted, (B) Incremental QALYs, and (C) Incremental Costs, per 1000 Patients
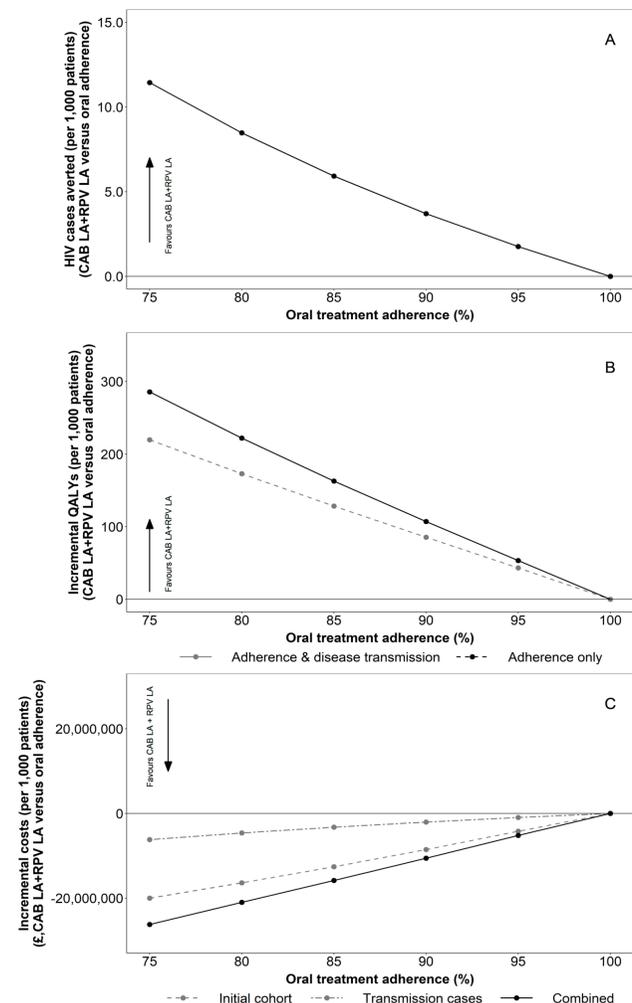


LA, long acting; QALY, quality-adjusted life year.

### Table 2. CAB LA+RPV LA vs. SoC: Disaggregated Incremental Costs for 5% Reduction in Adherence (Cost/Patient)

| Disaggregated incremental costs for 5% reduction in adherence (cost/patient) | | | | | | |
|---|---|---|---|---|---|---|
| Total | Health state | First-line therapy | First-line admin | Subsequent line | Salvage therapy | AE-related cost |
| £−4,215.92 | £200.37 | £4,533.61 | £471.43 | £1284.65 | £−10,750.54 | £67.38 |

## Discussion

- CAB LA+RPV LA has the potential to optimize adherence and subsequently reduce onward transmission vs oral SoC, leading to QALY gains and improved health outcomes for patients
- As a result of optimized adherence and minimal onward transmission, model estimates of treatment with CAB LA+RPV LA demonstrate substantial cost savings vs SoC
- Interfering medical conditions and HIV-specific emotional issues associated with daily oral dosing have not been included in analyses, but they may further increase the estimated QALY gains
  - Thus, these benefits demonstrated are likely to be an underestimate
- Further, it is important to note that, although economic analysis results in point estimates of cost or QALY gain, HIV is a complex infection and, thus, requires simplifying assumptions (as detailed) to model
  - It is likely that results will be highly variable around the point estimates from modeling
- Nevertheless, all analyses demonstrated potential additional benefits and cost savings for PLHIV receiving CAB LA+RPV LA compared with SoCs, thus demonstrating a large potential impact of the first LA regimen CAB LA+RPV LA

## Conclusions

- CAB LA+RPV LA is the first LA alternative available for maintenance treatment of HIV infection
- CAB LA+RPV LA offers an alternative for PLHIV for whom daily oral ART is challenging and provides a new choice of modality for effective management of this lifelong condition

**References:** 1. Trickey et al. *Lancet HIV.* 2017;4:e349-e356. 2. Iacob et al. *Front Pharmacol.* 2017;8:831. 3. Maggiolo et al. *Clin Infect Dis.* 2005;40:158-63. 4. Nachega et al. *Infect Dis Drug Targets.* 2011;11:167-174. 5. Yu et al. *BMC Public Health.* 2018;18:825. 6. Clay et al. *Medicine.* 2015;94:e1677. 7. Parienti et al. *Clin Infect Dis.* 2009;48:484-488. 8. Dorman et al. *J Perinatol.* 2017;37:215-219. 9. Levi-Minzi et al. *AIDS Patient Care STDS.* 2014;28:442-451. 10. Overton et al. CROI 2020; Virtual. Abstract 34. 11. Darlington et al. ISPOR US 2018; Baltimore, MD. Poster PIN55. 12. McEwan et al. ISPOR EU 2017; Glasgow, Scotland. Poster PIN63. 13. Ward et al. ISPOR EU 2018; Barcelona, Spain. Poster PIN64. 14. Ross et al. *Clin Infect Dis.* 2015;60:1102-1110. 15. Sherr et al. *AIDS Care.* 2008;20:442-448. 16. Pratt et al. *HIV Clin Trials.* 2001;2:146-159. 17. Sewell et al. *HIV Med.* 2017;18:463-473. 18. Kauf et al. *Value Health.* 2008;11:1144-1153.