Long-Acting Injectable CAB/LEN for Breastfeeding Women Living with HIV in South Africa

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BACKGROUND

- Long-acting injectable cabotegravir/lenacapavir (CAB/LEN) may reduce barriers for breastfeeding (BF) women with HIV who face challenges adhering to oral antiretroviral therapy (ART). CAB/LEN could reduce vertical transmission (VT) through BF and improve maternal and infant health outcomes. The cost of CAB/LEN remains uncertain.

METHODS

- We used the Cost-effectiveness of Preventing AIDS Complications (CEPAC) model to simulate mother-child pairs.
- Maternal cohorts, defined by status at delivery, include :
  1. VSHA: with viral suppression & high oral ART adherence
  2. VSLA: with viral suppression & low oral ART adherence
  3. DD: diagnosed with HIV at delivery
  4. NVS: not virally suppressed
- Women known to have HIV antenatally are prescribed oral TLD.
- Modeled strategies: After delivery, women either:
  1. Continue/start *TLD* - tenofovir/lamivudine/dolutegravir
  2. Start *CAB/LEN* – long-acting cabotegravir/lenacapavir
- Infants receive postnatal prophylaxis. Modeled outcomes include VT and maternal and pediatric life expectancy (LE) and lifetime HIV-related costs.
- Incremental cost-effectiveness ratios (ICERs) are calculated in $/year-of-life saved (YLS), using discounted combined maternal + pediatric LE and costs. "Cost-effective" defined as ICER < 0.5x GDP *per capita.* Willingness to pay (WTP) threshold = $3,100/YLS.
- In sensitivity analyses, we varied CAB/LEN cost and efficacy, BF duration, VT risk, and HIV care and PI-based regimen costs.
- In scenario analyses, we modeled a West African setting with lower antenatal care engagement, healthcare costs, and GDP-based WTP, using published data from Côte d'Ivoire as an example.

Table 1. Select base-case model input parameters

Parameter	VSHA	VSLA	DD	NVS
CD4 at delivery[1, 2]	535	480	399	322
Tenofovir/lamivudine/dolutegravir (TLD)				
6-month suppression (%)[1]	100	100	91	63
Annual drug costs (USD)[3]	37			
Long-acting CAB/LEN				
6-month suppression (%)[4]	100	100	97	94
Annual drug costs (USD)[5]	141			
24-month engagement in care (%)[6]	89	79	79	66
Mean BF duration (months)[1]	5			
Postnatal vertical transmission risk[7]	0.67-0.89%/month of BF			

1. Abrams, JIAS, 2025, Pepperrell, CID, 2021, Asare, OFID, 2023; 2. Western Cape programmatic data; 3. The Global Fund, 2024; 4. Brock, CID, 2024; 5. Hill, J Antimicrob Chemother, 2024, CHAI 2023, Phillips, Nat Commun, 2025; 6. Stover, JIAS, 2021, Haas, Lancet HIV, 2016; 7. Dugdale, JIAS, 2023.

Long-acting CAB/LEN could have substantial clinical impact. Cost-effectiveness will depend on pricing. Differential pricing will be essential to ensure equitable access across settings.

RESULTS

Table 2. Modeled clinical and cost-effectiveness outcomes

	Vert tx, %		Pediatric		Maternal		ICER
	PP	Total[a]	LE, y	Costs[b]	LE,[c] y	Costs[b]	
VSHA: Women with viral suppression & high oral ART adherence							
TLD	0.35	0.59	69.44	89	32.52	10,228	Ref
CAB/LEN	0.34	0.59	69.44	89	32.59	12,137	56,700
VSLA: Women with viral suppression & low oral ART adherence							
TLD	0.43	1.88	68.80	169	26.36	8,988	Ref
CAB/LEN	0.41	1.85	68.82	167	27.41	10,771	2,897
DD: Women diagnosed at delivery							
TLD	0.88	12.71	63.41	813	28.18	9,302	Ref
CAB/LEN	0.71	12.54	63.50	803	29.34	10,938	2,334
NVS: Women not virally suppressed							
TLD	1.49	4.29	67.62	317	22.27	9,429	Ref
CAB/LEN	0.88	3.68	67.88	279	24.77	10,169	452

PP: postpartum; LE: life expectancy; vert tx: vertical transmission.
a. Total = cumulative (intrauterine/intrapartum plus PP). b. costs in 2024 USD, discounted at 3%/year. c. Maternal LE is years lived after delivery.

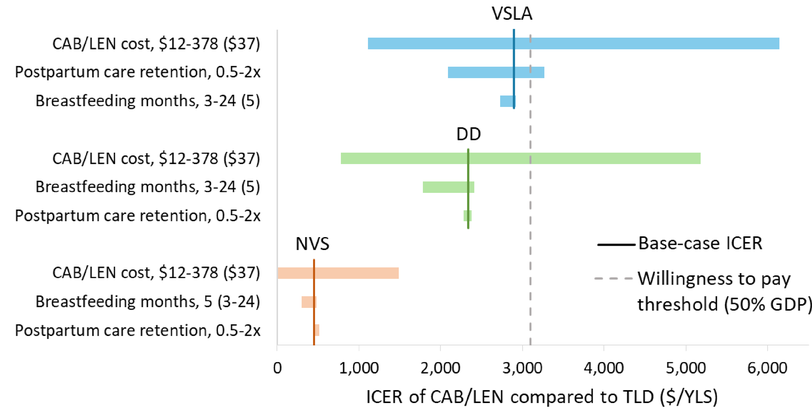
- CAB/LEN would modestly increase maternal LE, with little change in VT among women with VSHA. Benefits for mothers (LE gains >2 years) and infants (VT reductions 0.6-1.2%) would be greatest among women with NVS, and intermediate among women with VSLA and DD.
- At $141/year, CAB/LEN would be cost-effective for VSLA, DD, and NVS cohorts in South Africa.

PLAIN LANGUAGE SUMMARY

Using a computer model, we estimated the cost-effectiveness of long-acting cabotegravir/lenacapavir in breastfeeding women with HIV. We found that this regimen can reduce breastfeeding transmissions to infants, improve maternal health, and be cost-effective under specific conditions, particularly for women without viral suppression at delivery.

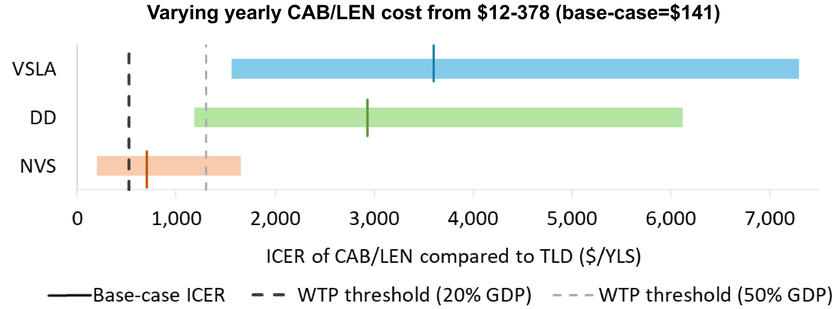
RESULTS, continued

Figure 2. Sensitivity analyses: CAB/LEN vs. TLD in South Africa



- Cost-effectiveness conclusions were most sensitive to CAB/LEN cost.

Figure 3. Scenario analyses: CAB/LEN vs. TLD in a West African Setting



- In a West African setting with a higher VT risk and lower antenatal care engagement, healthcare costs, and GDP-based willingness to pay threshold, CAB/LEN would ONLY be cost-effective among the NVS cohort under most modeled conditions.

CONCLUSIONS

- CAB/LEN for breastfeeding women with HIV could improve maternal health, reduce infant infections, and be cost-effective under specific CAB/LEN price, WTP, and care engagement conditions.
- Initiating CAB/LEN antenatally might achieve earlier viral suppression, leading to additional reductions in intrauterine and intrapartum transmission and improvements in maternal health.

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