

HIV in 2015:

Better Treatment but Ongoing Stigma

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Overview

- HIV – what is it?
- Changes in when to start HIV treatment
- What treatments to take
 - One pill once daily combinations
 - Older vs newer drugs
 - New forms of treatments coming
- HIV cure research

HIV – What is it?

- HIV = Human Immunodeficiency Virus
- AIDS = Acquired Immune Deficiency Syndrome
- A person get infected with the virus... AIDS is what happens during the late stage of having the infection

You may be able to save on your prescription for **COMPLERA**

[Learn about patient assistance options »](#)





HIV – the early days

- 4 H' s of HIV:
 - Hemophiliacs
 - Heroin addicts
 - Homosexuals
 - Haitians

Pediatric HIV – >30 years into an epidemic

- 1982 – 4 AIDS deaths reported among infants born to mothers from known AIDS risk groups
- Soon recognized that majority of pediatric HIV infections resulted from mother-to-child transmission
 - In utero
 - Peripartum
 - Breast milk



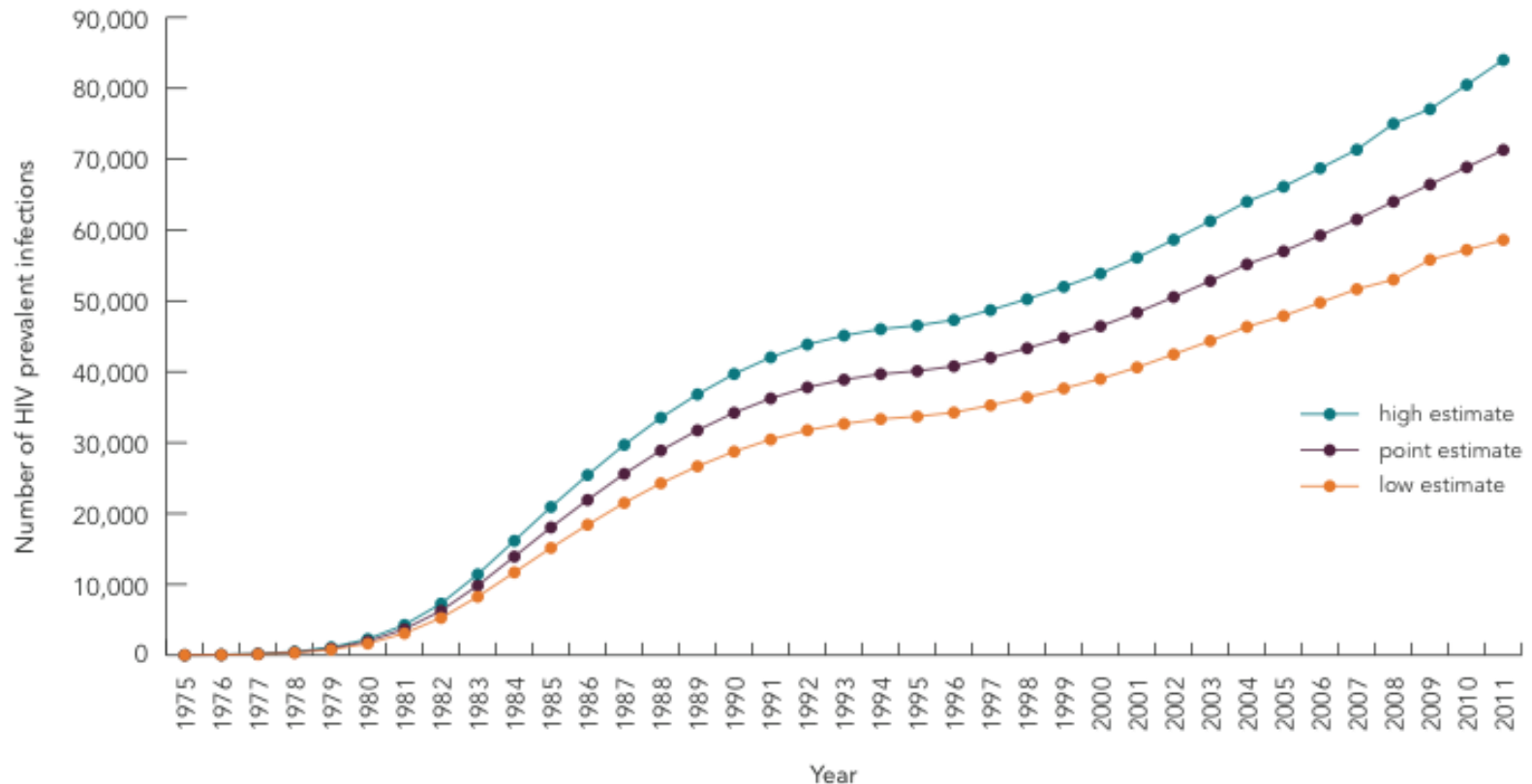
Global Burden of HIV

- Globally, HIV is a disease that affects **35 million** people worldwide (2013 estimate); 10% children <15 years
- Many groups of people affected – not only previous “high-risk” groups – majority of infections globally occur in general population through heterosexual intercourse
- Extremely common in Africa, but many cases in developed countries including Canada & US

Burden of HIV in Canada

- In Canada, HIV is estimated to affect **71,000** people (2011 estimate)

FIGURE 1. Estimated number of prevalent HIV infections in Canada by year.



Burden of HIV in Canada

TABLE 1. Estimated number of prevalent HIV infections and associated ranges of uncertainty in Canada at the end of 2011 and 2008 by exposure category, sex and ethnicity (point estimates and ranges are rounded)

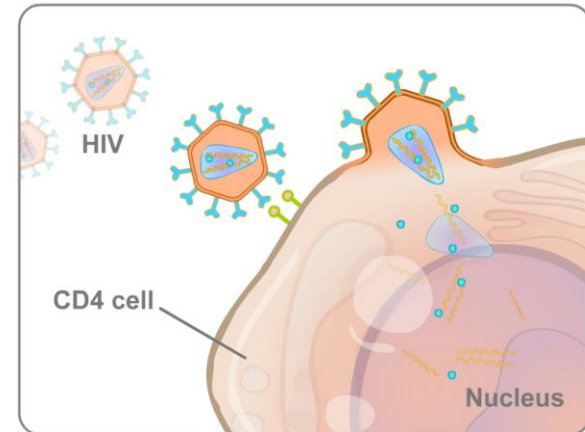
CLASSIFICATION	2011			2008		
	POINT	RANGE	PERCENTAGE	POINT	RANGE	PERCENTAGE
Exposure category						
MSM	33,330	28,160–38,500	46.7%	30,000	25,000–35,000	46.9%
MSM-IDU	2,160	1,520–2,800	3.0%	2,030	1,460–2,600	3.2%
IDU	12,040	9,580–14,500	16.9%	11,150	9,000–13,300	17.4%
Heterosexual/non-endemic	12,530	10,260–14,800	17.6%	10,900	8,900–12,900	17.0%
Heterosexual/endemic	10,640	8,780–12,500	14.9%	9,320	7,640–11,000	14.6%
Others	600	400–800	0.8%	600	400–800	0.9%
Sex						
Female	16,600	13,200–20,000	23.3%	14,740	11,980–17,500	23.0%
Male	54,700	44,400–65,000	76.7%	49,260	40,520–58,000	77.0%
Ethnicity						
Aboriginal	6,380	5,160–7,600	8.9%	5,440	4,380–6,500	8.5%
Non-Aboriginal	64,920	52,840–77,000	91.1%	58,560	47,120–70,000	91.5%
Total	71,300	58,600–84,000	100%	64,000	53,000–75,000	100%

MSM: men who have sex with men; MSM-IDU: men who have sex with men and inject drugs; IDU: people who inject drugs; Heterosexual/non-endemic: heterosexual contact with a person who is either HIV-infected or at risk for HIV or heterosexual contact as the only identified risk; Heterosexual/endemic: origin in a country where HIV is endemic; Other: recipients of blood transfusion or clotting factor, perinatal and occupational transmission

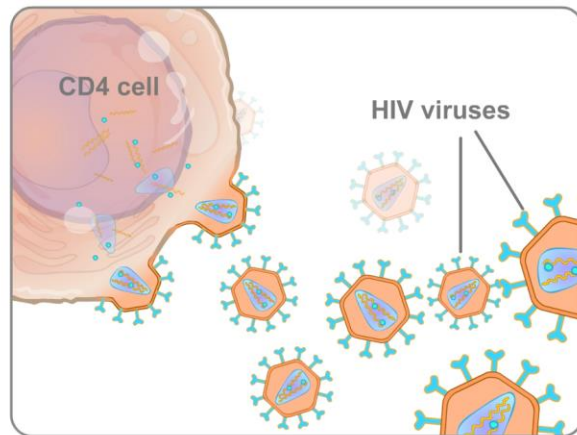
What does HIV do?

- Virus enters the body
- Infects CD4 cells
- Replicates (makes more copies of itself) in CD4 cells

HIV Cell Invasion



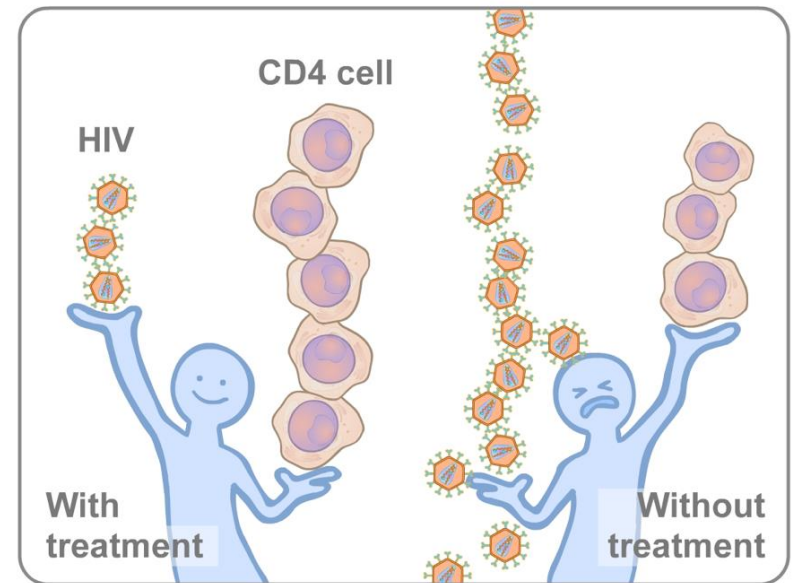
HIV attaches to the CD4 cell and injects its contents.



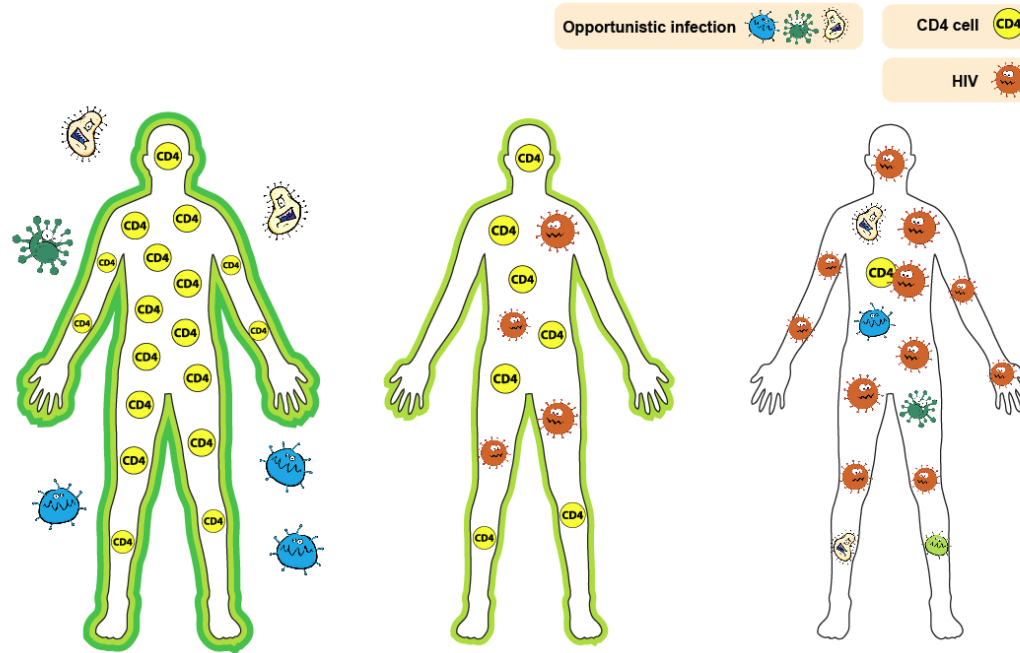
The infected CD4 cells are used to make more copies of the HIV virus. This destroys the CD4 cells.

What does HIV do?

- The body deals with it initially
- Eventually, the amount of virus in the body goes up and the **CD4 cells** go down
- Low CD4 cells means the **immune system** is very weak & at risk for severe infections



Without treatment, the number of the CD4 cells becomes very low and the immune system is weakened.



How HIV affects the body

- 'Soldiers' to protect the body from germs are called CD4 therefore they keep the body healthy
- After penetrating into the body, HIV attack CD4, making the number of CD4 cells decreases, thus they cannot protect the body
- The body is weak and gets diseases from different germs

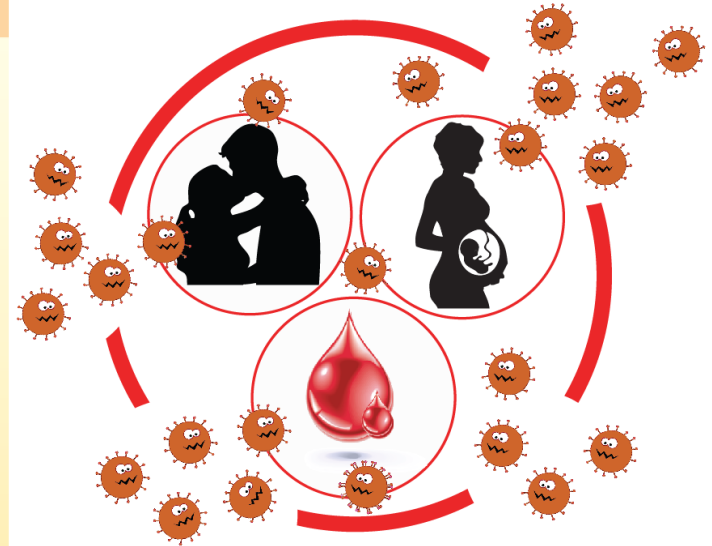
HIV Transmission

- **What is HIV?**

- HIV: a virus that causes immunodeficiency. That means HIV penetration into the body makes it difficult for the body to fight other germs in order not to get sick

- **How is HIV transmitted?**

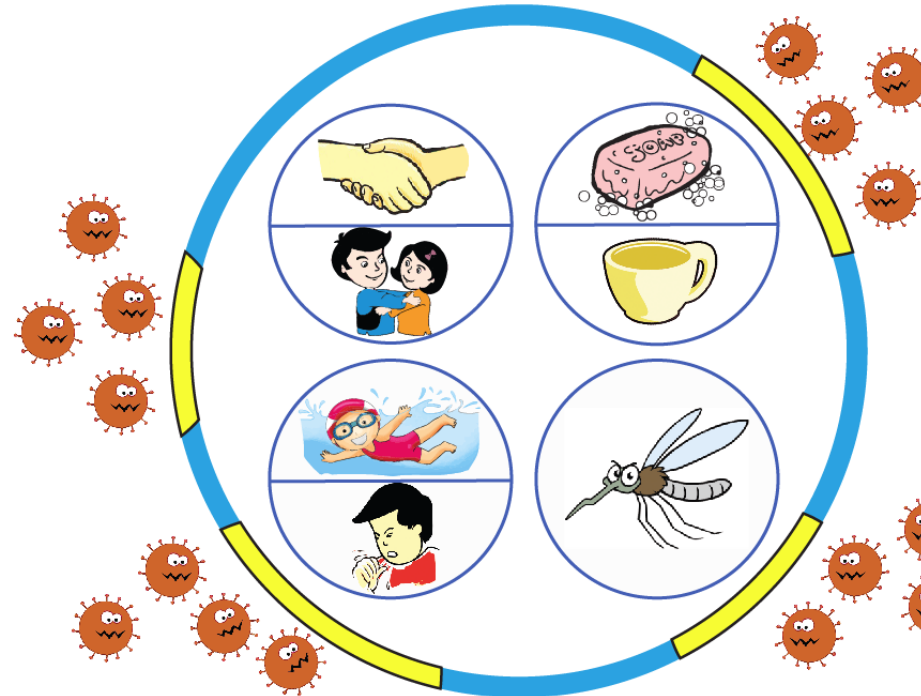
- From their mothers: during pregnancy, delivery & breastfeeding
- Through direct contact with blood or body fluids containing blood
- Through unprotected sexual intercourse



HIV Transmission

● HIV is not transmitted through:

- Tear, saliva, sweats, urine...that do not contain blood
- Casual contact
- Sharing air/water
- Sharing objects
- Insect bites

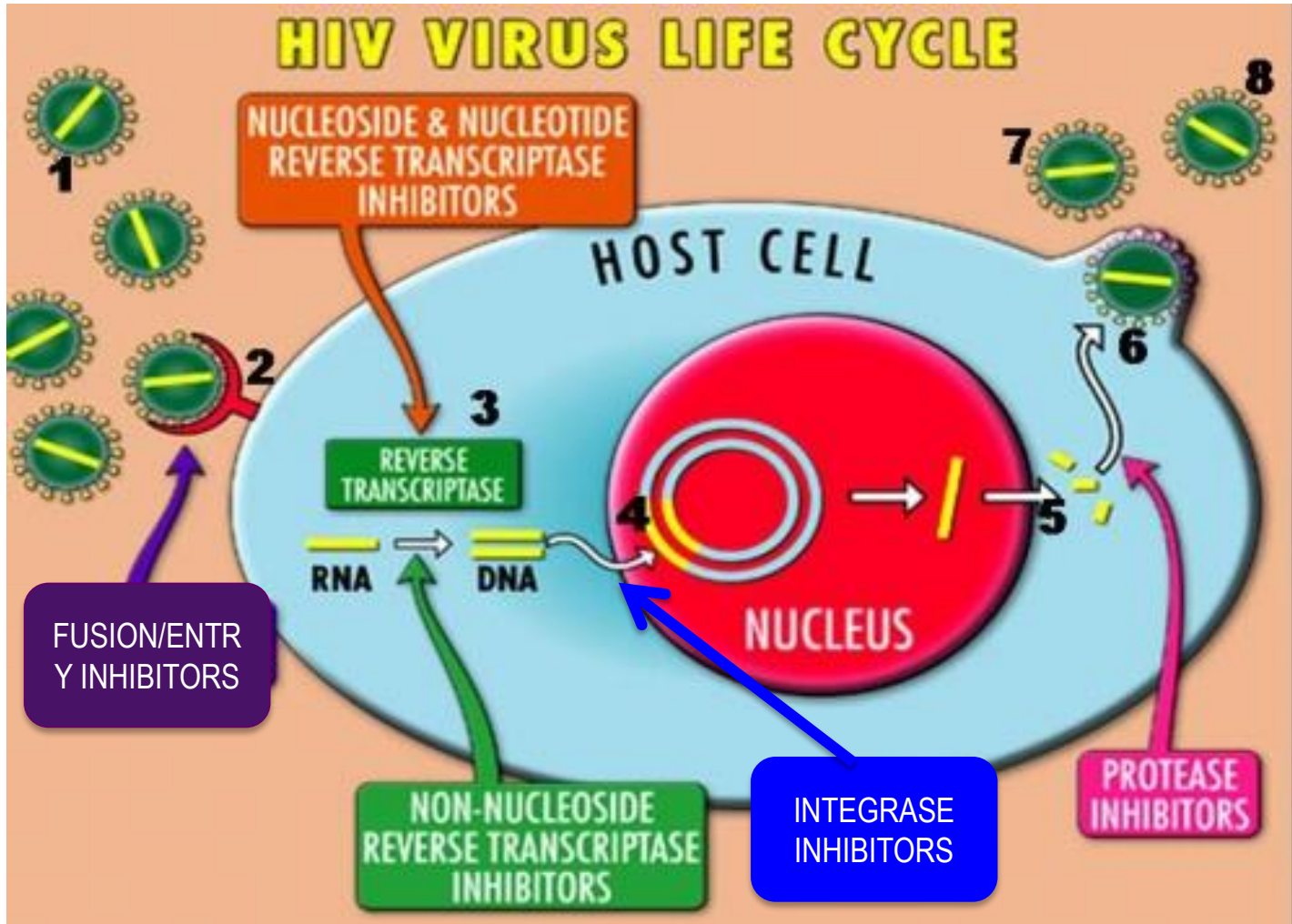


HIV Treatment

- Good news – HAART (Highly Active Anti-Retroviral Therapy) controls the infection by suppressing virus production and allowing immune system (CD4) recovery
- HIV has changed from a death sentence to a chronic manageable disease (like diabetes, high blood pressure)



Zidovudine, Lamivudine,
Tenofovir, Abacavir...



Maraviroc

Efavirenz, Nevirapine,
Raltegravir, Elvitegravir,
Dolutegravir

Raltegravir, Elvitegravir,
Dolutegravir

Lopinavir,
Atazanavir,
Darunavir...

Highly Active Antiretroviral Therapy (HAART) vs Combination ART (cART)

- HAART vs cART
- 3 active drugs, usually from 2 different classes
- In the past, this meant having to take many pills,
2 – 3 times per day



Combination ART (cART)

- These days, one pill once daily treatments are available and preferred
 - Combining 3 or 4 drugs in one pill
 - Seem to work better – not necessarily because the medicines are better than other medicines, but because people are able to take them better

Single Tablet Regimens



ATRIPLA
(efavirenz + tenofovir + emtricitabine)

One tablet once a day. Contains two NRTIs and one NNRTI in one tablet.

Take on an empty stomach and at bedtime to minimize dizziness, drowsiness and impaired concentration.



COMPLERA
(rilpivirine + tenofovir + emtricitabine)

One tablet once a day. Contains two NRTIs and one NNRTI in one tablet.

Take with a meal containing fat.



STRIBILD
(elvitegravir + cobicistat + tenofovir + emtricitabine)

One tablet once a day. Contains two NRTIs, one integrase inhibitor and one pharmacokinetic (PK) enhancer in one tablet.

Take with food.



TRIUMEQ
(dolutegravir + abacavir + lamivudine)

One tablet once a day. Triumeq alone is not recommended for people with known HIV resistance to abacavir, lamivudine or any of the approved integrase inhibitors.

Take with or without food.

Contains abacavir and should only be used in patients that are HLA-B*5701 negative.

One pill once-a-day combinations

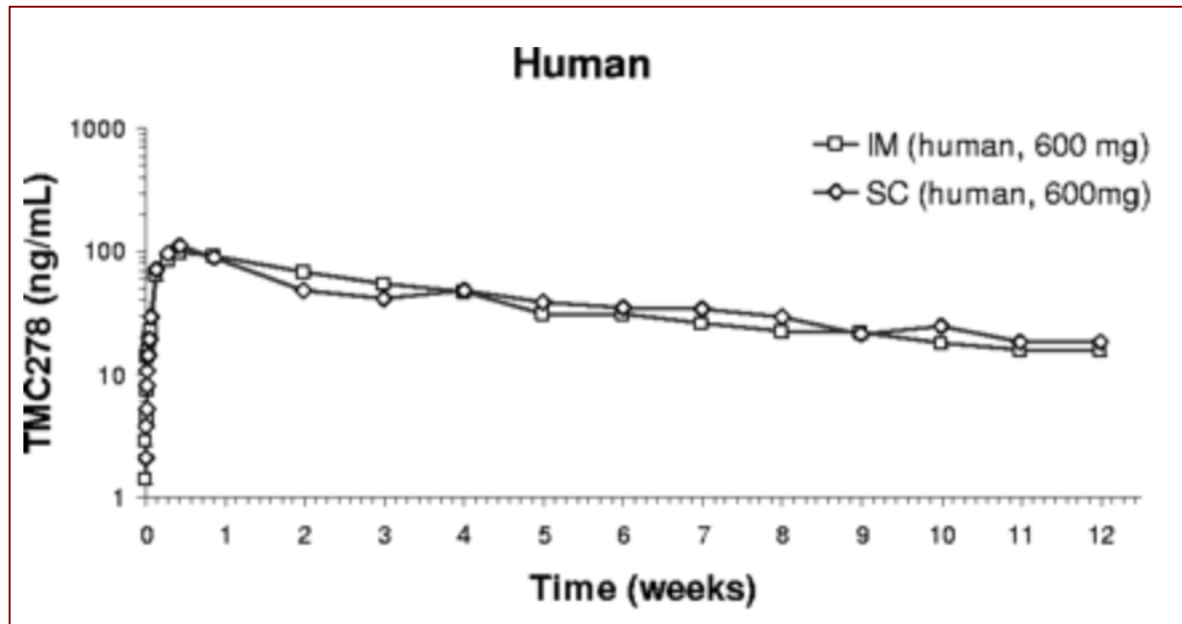
- **Atripla**
 - tenofovir + emtricitabine + efavirenz
 - **Stribild**
 - tenofovir + emtricitabine + elvitegravir + cobicistat
 - **Complera**
 - tenofovir + emtricitabine + rilpivirine
- ...and just recently
- **Triumeq**
 - abacavir + lamivudine + dolutegravir



In the near future???

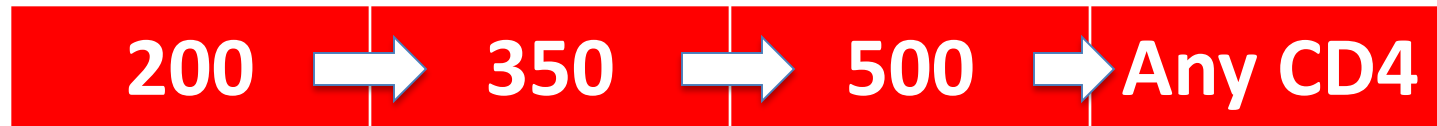
- Long-acting injectable ARVs are under study, similar to injectable contraception

Pharmacokinetics and Disposition of Rilpivirine (TMC278) Nanosuspension as a Long-Acting Injectable Antiretroviral Formulation



HIV Treatment Recommendations

- Recommendations for when to start treatment have changed a lot over the last decade, with a gradual trend towards earlier treatment



- Goals are two-fold:
 - Keep the person healthy – earlier, preventing complications
 - Reduce spread of HIV (lots of studies now supporting ***Treatment as Prevention***)

HIV in Pregnancy

- Recommendations on PMTCT
 - Canadian GLs
 - US DHHS GLs
 - BHIVA GLs
- HIV dx'd before/in pregnancy
- Full 3-drug treatment pre/T2
- IV AZT in labour
- Oral AZT to baby x 6 weeks
- No breastfeeding
 - Risk of transmission <1%



VT of HIV in Canada

A national review of vertical HIV transmission

John C. Forbes^a, Ariane M. Alimenti^a, Joel Singer^{b,f}, Jason C. Brophy^c,
Ari Bitnun^d, Lindy M. Samson^c, Deborah M. Money^e, Terry C.K. Lee^f,
Normand D. Lapointe^g, Stanley E. Read^d, the Canadian Pediatric AIDS
Research Group (CPARG)

AIDS 2012, **26**:757–763

Good News:

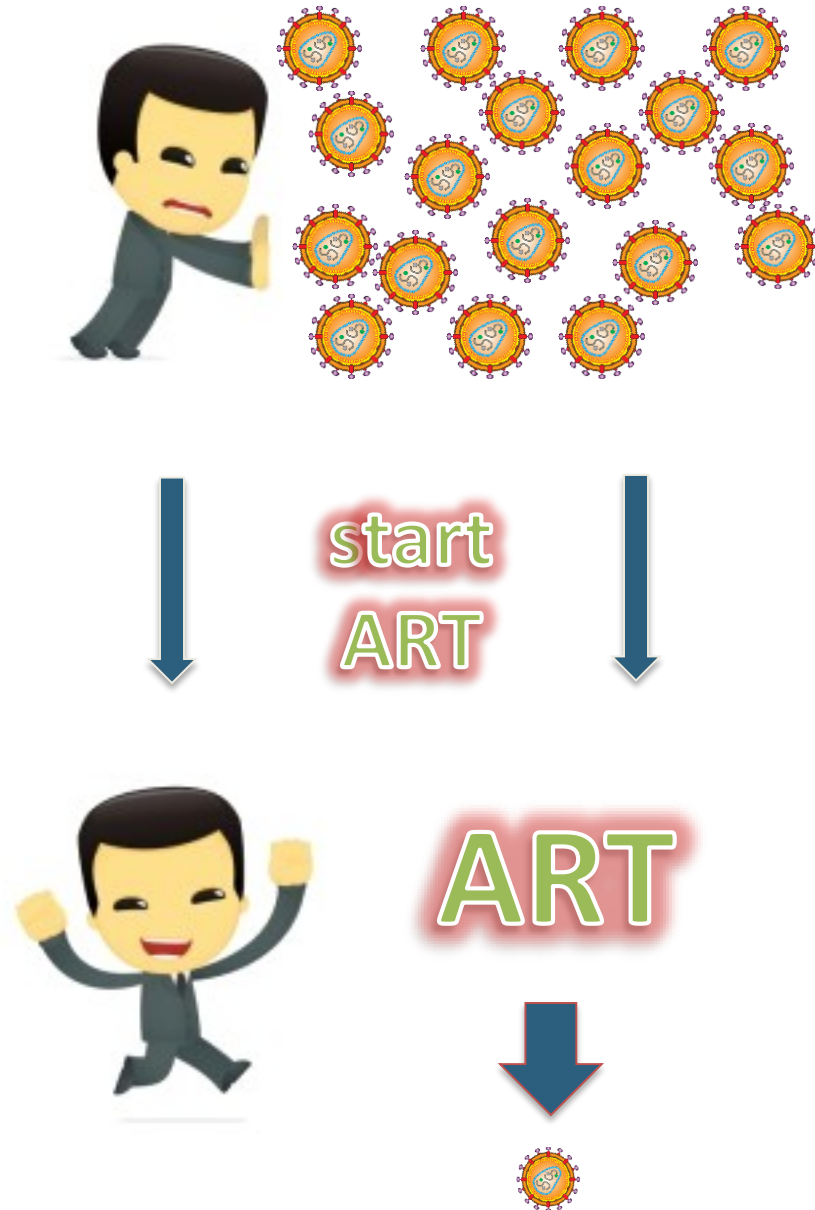
- **Vertical transmission:**
 - **2.9%** overall since 1997
 - **0.4%** if >4 weeks cART

Bad News

- 8 positive infants in 2010/11

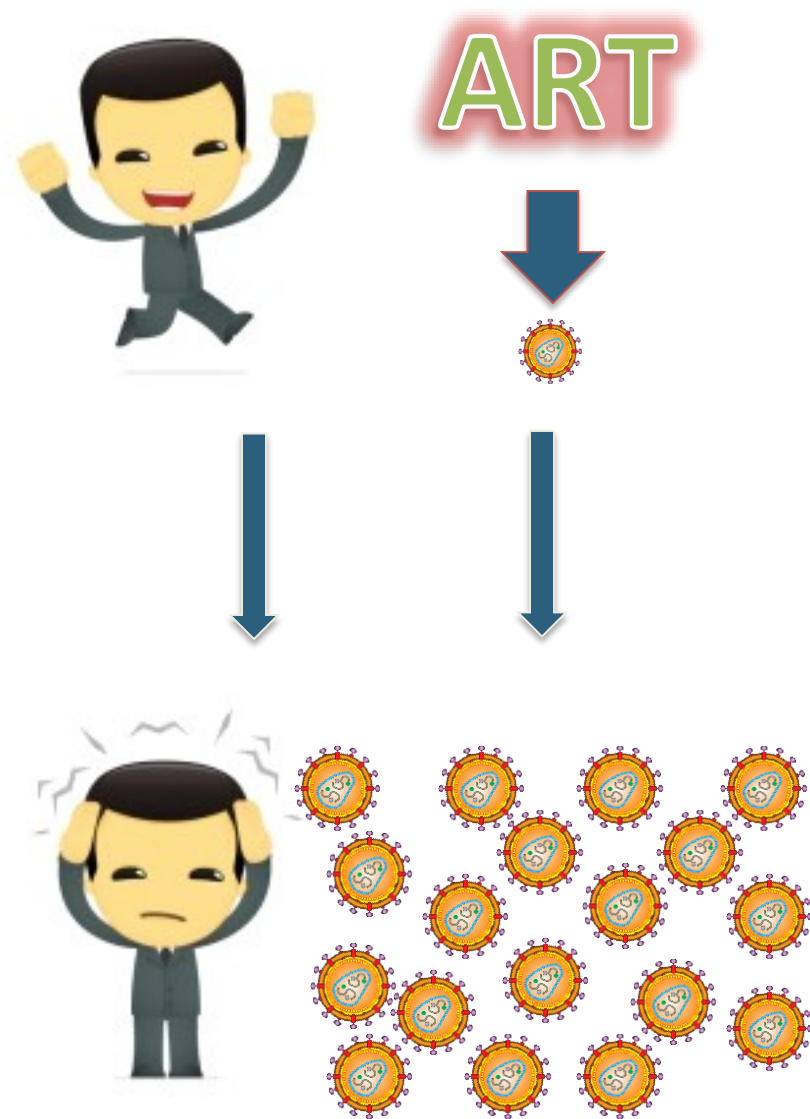
HIV cure research

- ART controls HIV replication in the blood and other compartments (genital tract, breast milk)
- When a person is started on ART, the viral load decreases to “undetectable” (<50 viral copies/mL of blood) within 2-6 months



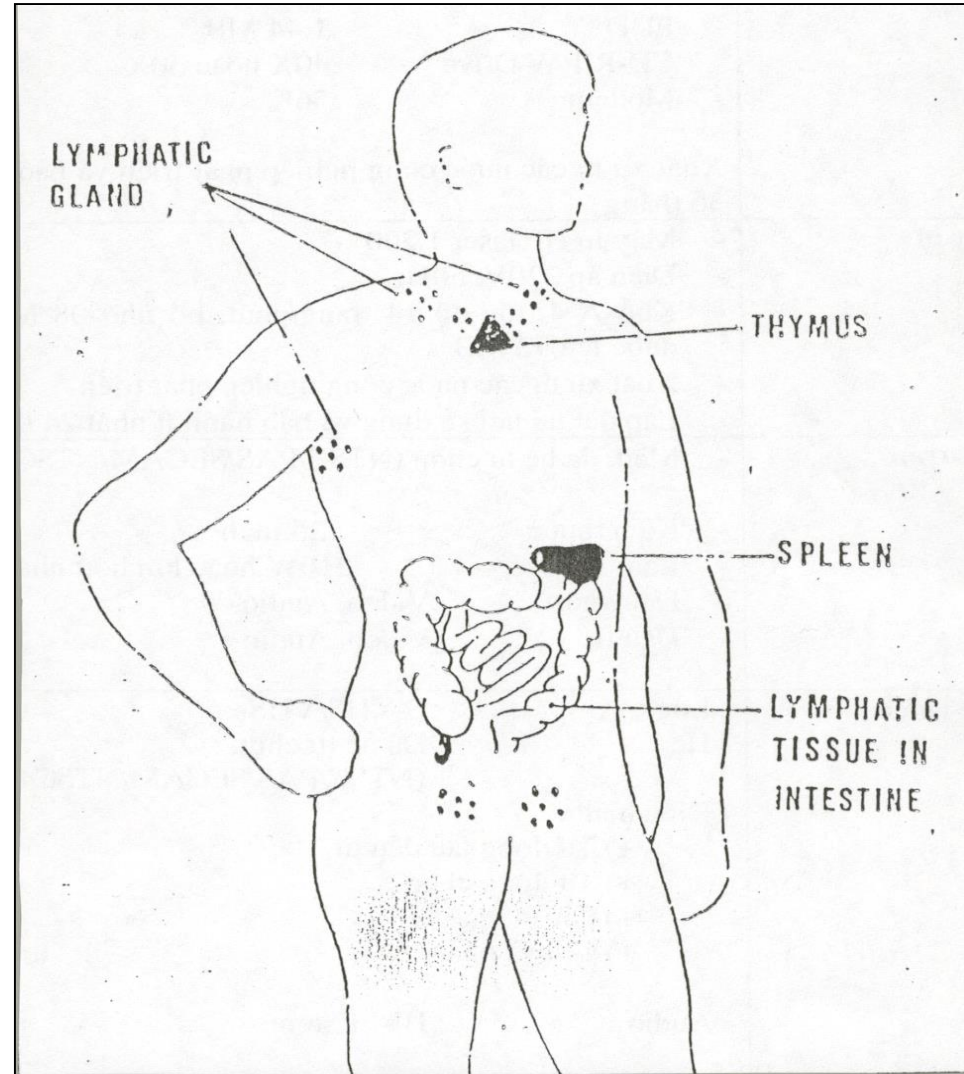
HIV cure

- But ART does not get rid of the HIV virus – if ART is stopped, the viral load climbs up again
- This is because even with ART, the virus remains integrated into the DNA in certain kinds of CD4 cells, capable of producing more HIV viruses if ART is not used

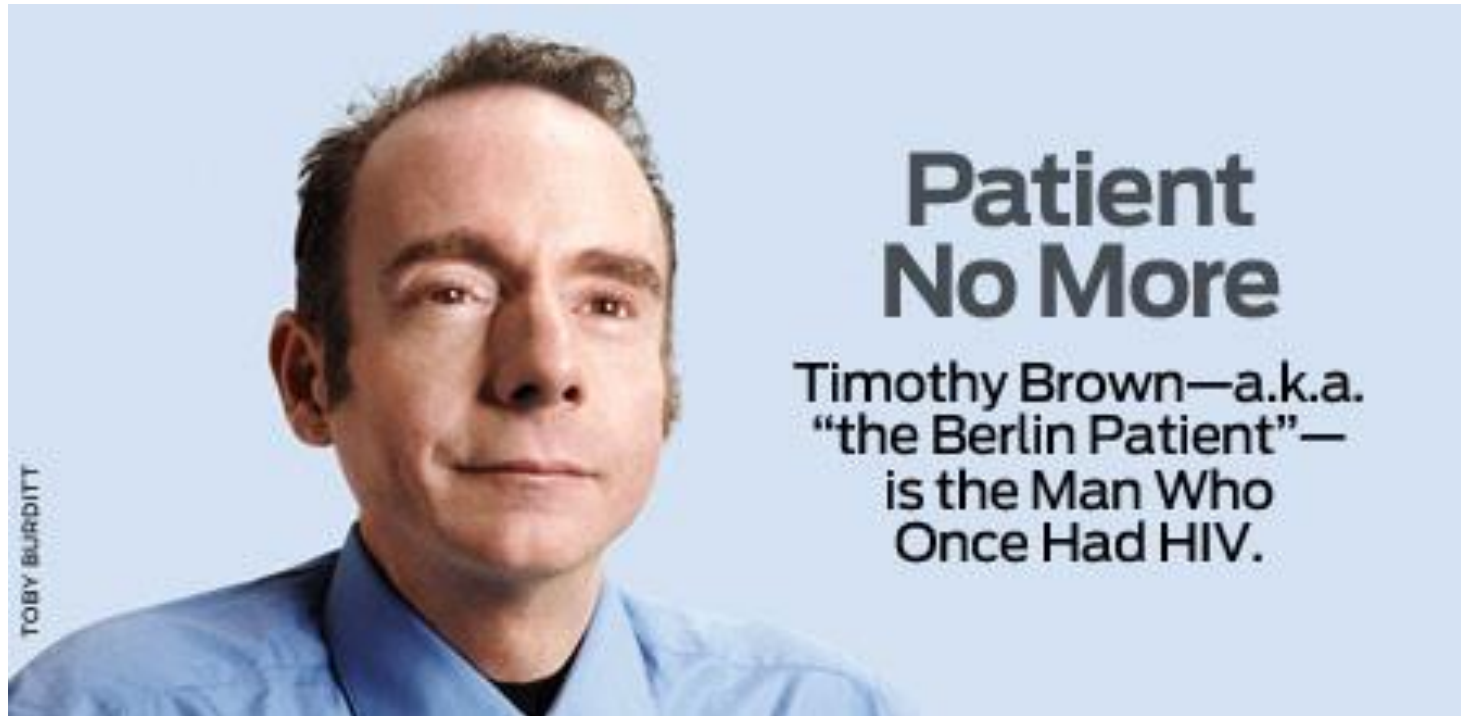


HIV reservoirs

- The kinds of cells where HIV hides and remains “latent” in the body are called “viral reservoirs” – long-lived cells with HIV integrated into their DNA, which can become activated many years later to produce more HIV virus
 - Certain tissues -> gut lymphoid tissue, lymph nodes, spleen, thymus; small numbers in blood
- Researchers have long believed that if they can target and remove these reservoirs, then HIV can be cured



Berlin Patient



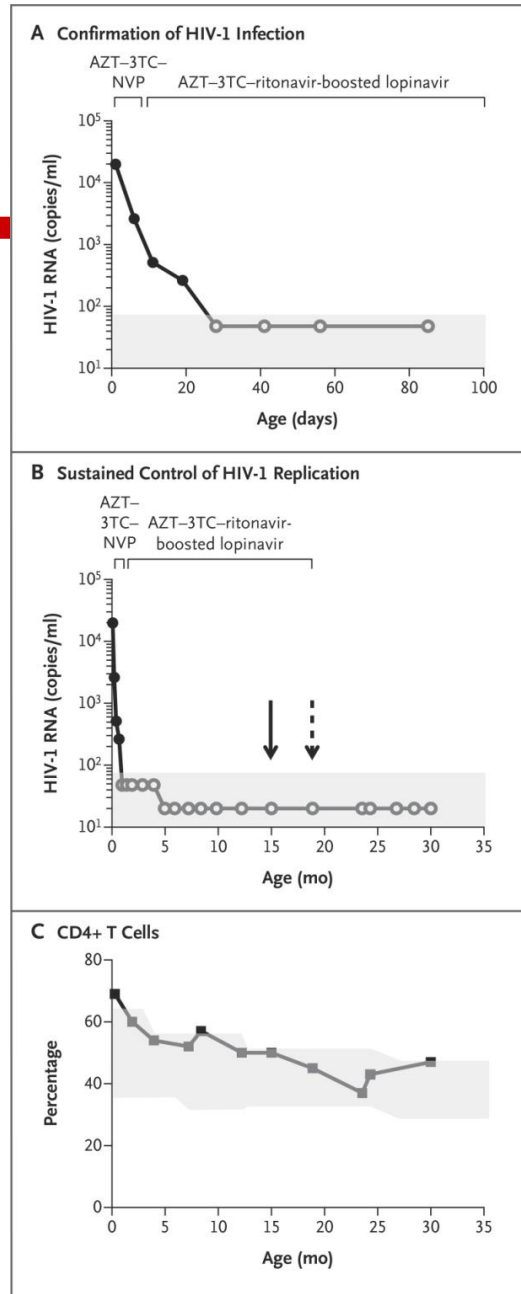
TOBY BURDITT

Patient No More

Timothy Brown—a.k.a.
“the Berlin Patient”—
is the Man Who
Once Had HIV.

« Mississippi Baby »

- Infant born to a HIV+ mother
- Mother's infection was detected only after delivery
- Treatment of the infant was started at 30 hours of age – full cART instead of prophylaxis dosing
- Treatment interrupted at 18 months
- No sign of the virus despite lack of treatment
- **Virus returned in the bloodstream 27 months later**
- **Not a cure, but possibly a remission – made possible by limiting reservoir size through immediate treatment**



Summary

- Lots new in HIV
- Great treatments, easier to take and very effective
- Medical aspects of HIV are much improved
- **Biggest struggle for most people living with HIV now remains STIGMA**

Haoua Inoua

Thank you!