

Core curriculum for Infection Control

HIV & hepatitis in Taiwan

Chin-Shiang Tsai, M.D.

Division of Infectious Diseases

National Cheng-Kung University Hospital, Douliu Branch

Outlines

- HIV
- HIV & HBV in Taiwan
- HIV & HCV in Taiwan
- HIV & HAV in Taiwan



The way of HIV transmission

Certain body fluids: blood, semen (cum), pre-seminal fluid (pre-cum), rectal fluids, vaginal fluids, and breast milk (rich in lymphocytes)

Damaged mucosa / tissue

Bloodstream

Three major structural genes

Gag	Group Antigen	e.g. p24, p18
Pol	Polymerase	e.g. RT
Env	Envelope	e.g. gp41, gp 120

<http://www.cdc.gov/hiv/risk/index.html>
Goldman's Cecil Medicine, 24th edition (Fig 394-2)

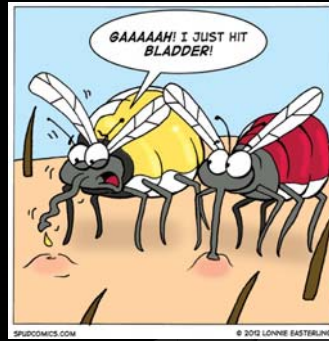
You may get HIV from:

- Unprotected sex (receptive anal > insertive anal > vaginal sex)
- Oral sex (fellatio most risky; lesbian sex very rare)
- Sharing needles, syringes, rinse water for IV drug users
- Bitten and injured by HIV patients
- Stuck with an HIV-contaminated needle or other sharp object
- Mother-to-child (pregnancy, birth, or breastfeeding)
- Blood transfusion
- Organ transplantation

<http://www.cdc.gov/hiv/risk/index.html>

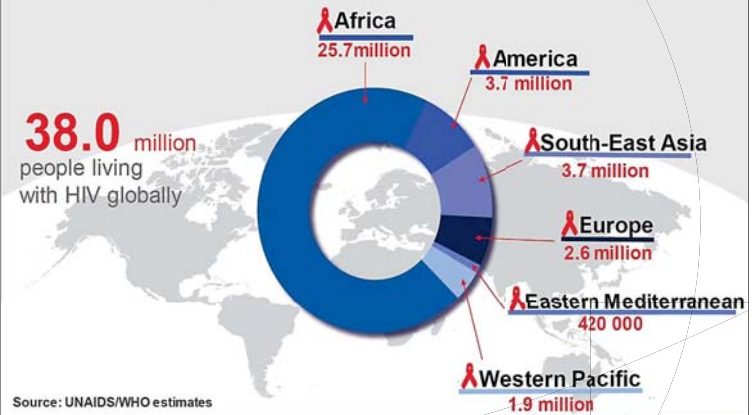
You won't get HIV from:

- Mosquito bites
- Shaking hands
- Kiss or hug (except deep kiss)
- Saliva, sweats, tears
- Sharing utensils
- In the same swimming pools



<http://www.cdc.gov/hiv/risk/index.html>

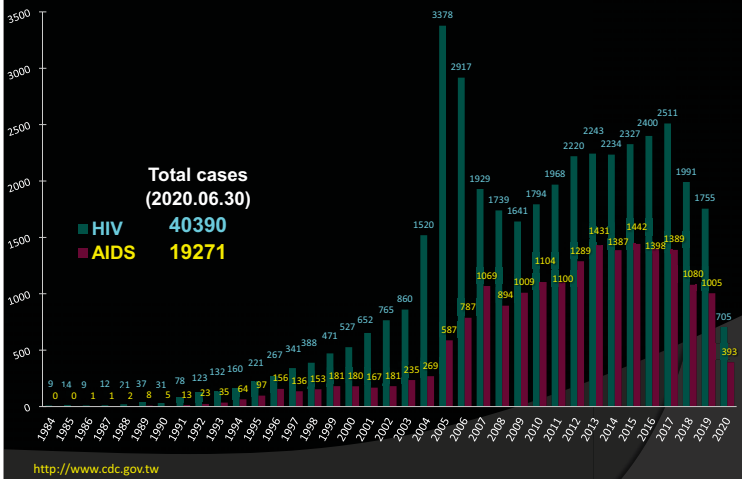
People living with HIV by WHO region (2019)



Source: UNAIDS/WHO estimates

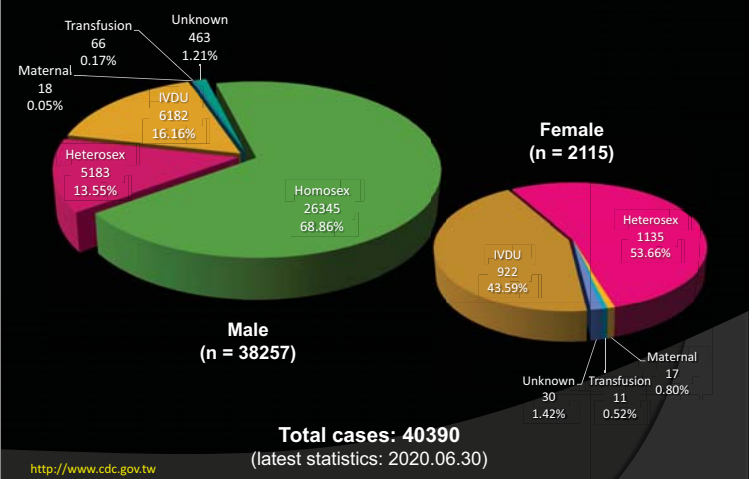


Number of new cases infected with HIV /AIDS in Taiwan (CDC-Taiwan, 2020)



<http://www.cdc.gov.tw>

Transmission Categories of people with HIV/AIDS in Taiwan (CDC-Taiwan, 2020)



<http://www.cdc.gov.tw>



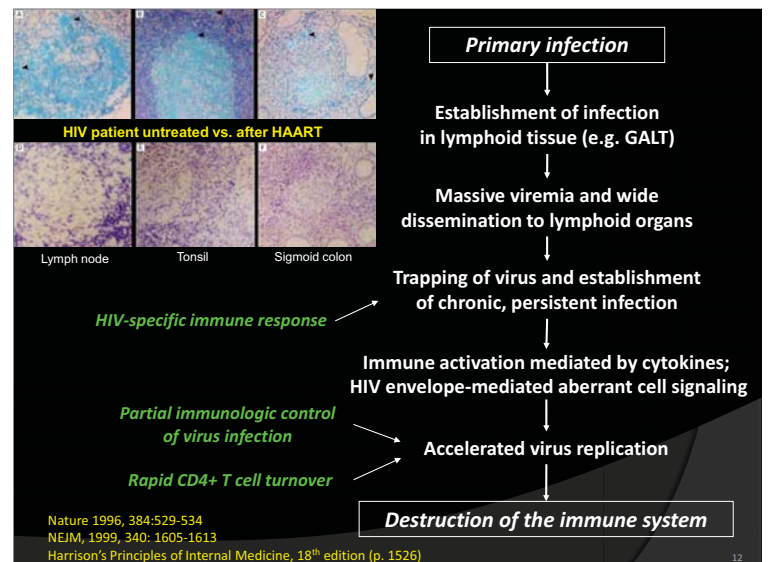
Anthony S. Fauci, M.D. (1940-)

Director of NIAID, USA (since 1984)

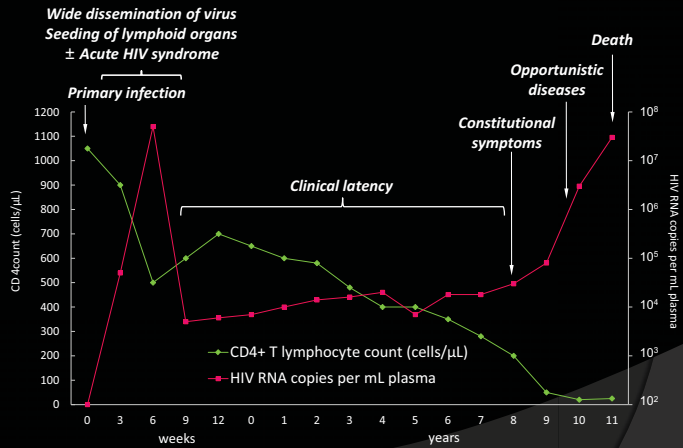
Major contribution to the treatment of vasculitis, and the mechanism of HIV/AIDS

Recipient of the U.S. Presidential Medal of Freedom (2008)

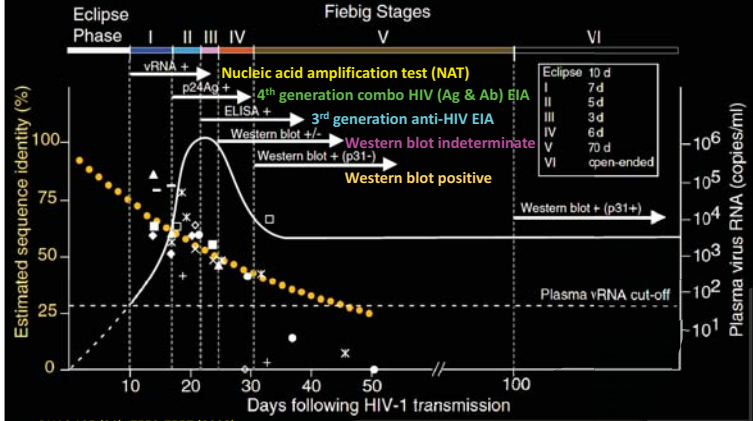
<https://time.com/5818134/anthony-fauci-never-shake-hands-coronavirus/>



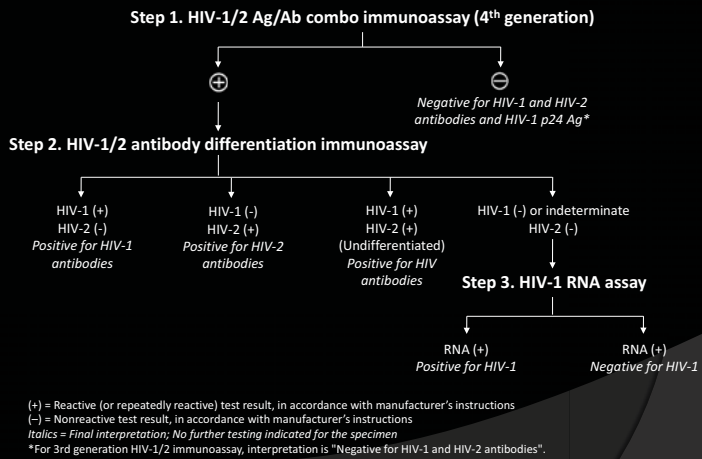
Typical course of an untreated HIV-infected individual



Fiebig stages defined by lab results



New HIV diagnostic algorithm (U.S. CDC)



疾管署新版檢驗定義

檢驗定義符合下列任一情形。

- HIV 抗原/抗體複合型篩檢(HIV antibody and antigen combination assay)或抗體篩檢(EIA 或 PA)陽性，再經HIV-1/2 抗體確認檢驗方法(抗體免疫層析檢驗法或西方墨點法)，確認為陽性反應者(年齡須大於 18 個月)。
- HIV 分子生物學核酸檢測(NAT)呈陽性反應者。
- HIV 抗原 p24 篩檢陽性，且進行中和試驗(Neutralization test, NT)，確認為陽性反應者。(年齡須大於 1 個月)
- *若使用快速抗體篩檢檢測陽性者，仍需進行 HIV 抗原/抗體複合型篩檢或抗體篩檢。

Timing of initiating antiretroviral therapy (ART)



David D. Ho, M.D. (1952-)

Taiwanese American AIDS researcher

CEO of Aaron Diamond AIDS Research Center (since 1990)

TIME Man of the Year (1996)

Recipient of U.S. Presidential Citizens Medal (2001)

"Time to hit HIV, early and hard."

NEJM, 1995; 333:450

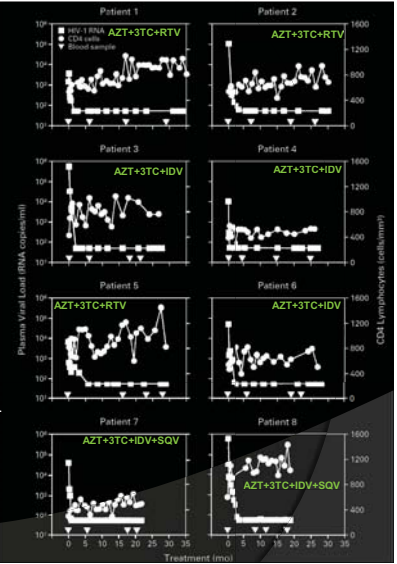
Dr. David Ho's major achievement

- One of the earliest to consider AIDS as viral infection
- The fourth in the world to isolate HIV-1 virus (HTLV-III)
- The first to isolate HIV-1 in semen and in the CNS
 - Science. 1984 Oct 26;226(4673):451-3.
 - N Engl J Med 1985; 313:1493-1497
- The first to show HIV-1 grows in long-lived macrophages
 - J Clin Invest. 1986 May; 77(5): 1712-1715
- One of the earliest to describe acute HIV syndrome
 - Ann Intern Med. 1985 Dec;103 (6Pt 1):880-3.
- One of the earliest to prove high viral load when primary HIV infection
 - NEJM. 1991 Apr 4;324(14):961-4 (with George Shaw et al)

Dr. David Ho's major achievement (2)

- High viral replication/clearance during clinical latency
- Combination therapy could persistently suppress HIV to undetectable levels
- The odds of resistance against three drugs within the therapy simultaneously will be 10 M to 1

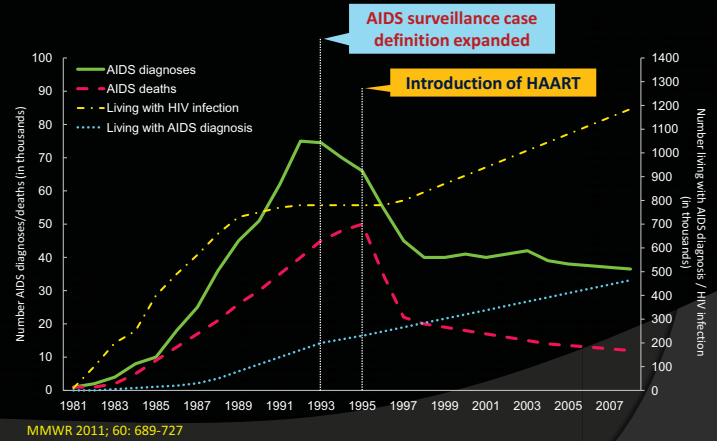
Nature. 1995 Jan 12;373(6510):123-6
 Science. 1996 Mar 15;271(5255):1582-6
 Nature. 1997 May 8;387(6629):188-91
 NEJM. 1999, 340: 1605-1613



The advent of HAART

N Engl J Med. 1997 Sep 11;337(11):734-9.

Persons living with HIV/AIDS and of AIDS deaths in the U.S. from 1981 to 2008

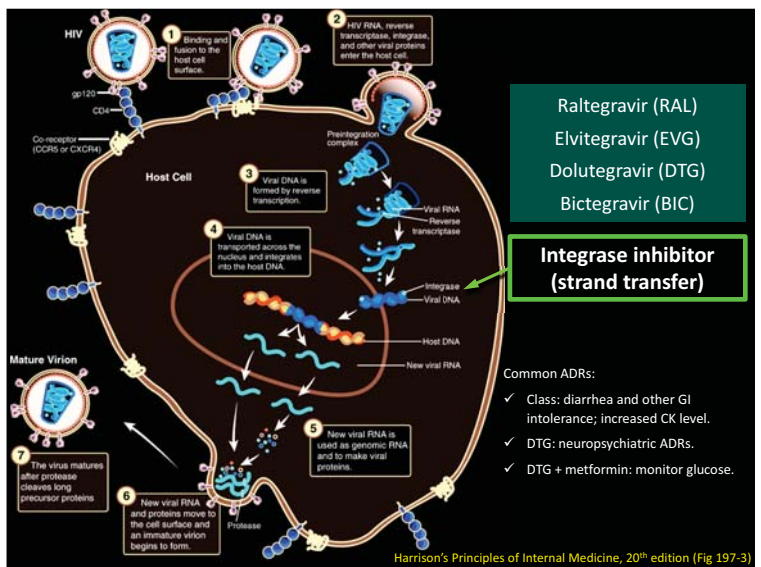
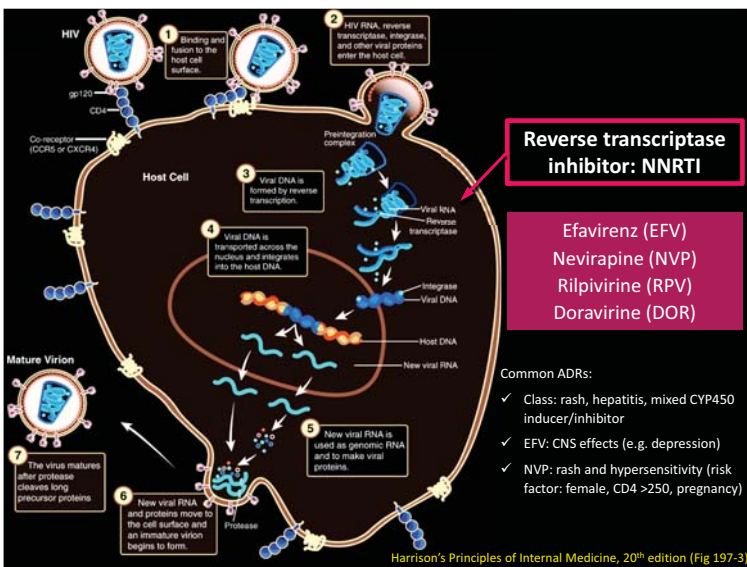
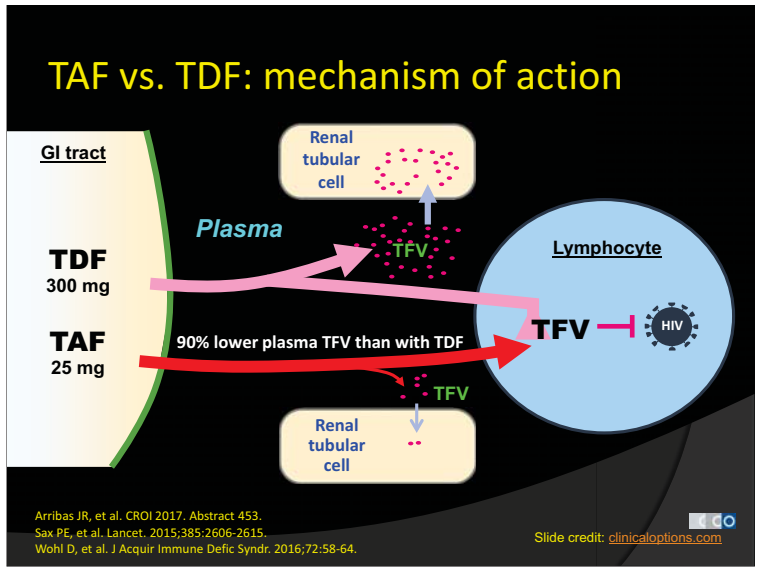
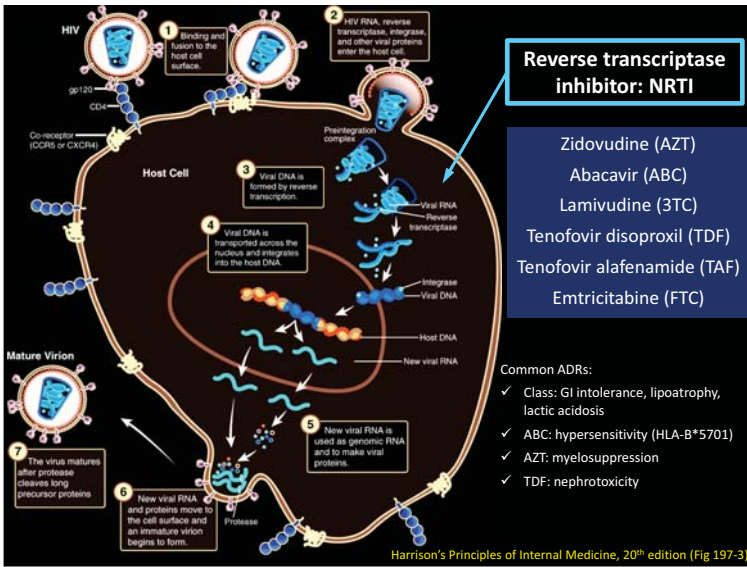
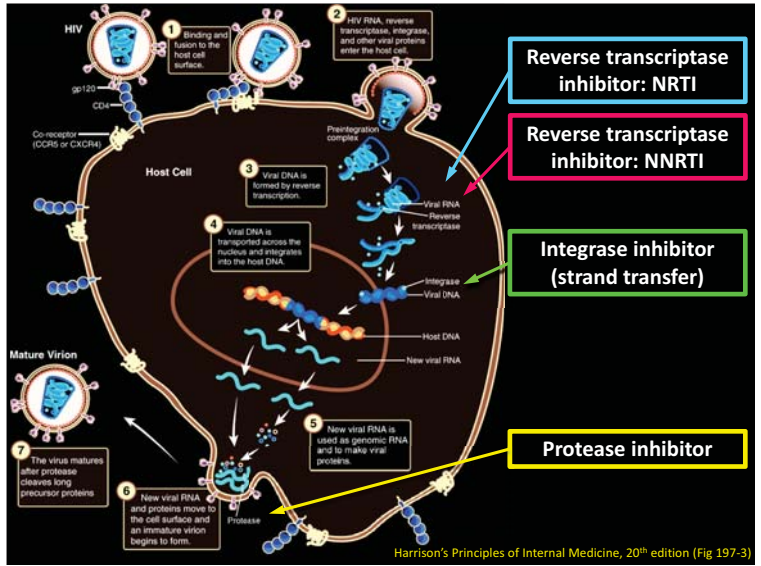


When to start ART?

- ART is recommended for all persons with HIV
 - To reduce morbidity and mortality.
 - To prevent the transmission of HIV to others.
- Initiate ART as soon as possible after HIV diagnosis
 - To increase the uptake of ART and linkage to care.
 - To decrease the time to viral suppression.
 - To improve the rate of virologic suppression among persons with HIV.
- Educate patients regarding the benefits of ART.
- Optimize care engagement and treatment adherence.

Choices of ART regimens

Fight for HIV drugs in the 1980s



DAIG Deutsche AIDS-Gesellschaft e.V. **ÖSTERREICHISCHE AIDS GESELLSCHAFT**

Combination partner 1

TAF/FTC ¹
TDF ⁴ /FTC ²
ABC/3TC ³
TDF/3TC (+Doravirine)
Tenofovir + Lamivudine

NRTI

Combination partner 2

Dolutegravir
Bictegravir/c (+TAF/FTC)
Raltegravir
Elvitegravir/c (+TAF/FTC)

INI

Rilpivirine (+TAF/FTC)
Doravirine

NNRTI

Darunavir/r or /c (+TAF/FTC or ABC/3TC)
Atazanavir/r or /c
Darunavir/r or /c (+TDF/FTC)

PI

Recommended
Alternative

- Kein Einsatz bei Schwangerschaft und Tuberkulose.
- Nicht mit Ritonavir, Cobicistat oder ATV, bei erhöhtem Risiko für Osteoporose oder Niereninsuffizienz/Nierenversagen (z.B. unter NSAR).
- Einsatz nach negativem Screening auf HLA-B*57:01, Einsatz mit Vorsicht bei Plasmavirämie >100.000 Kopien/ml oder hohem kardiovaskulärem Risiko.
- TDF = Tenofovir Disoproxil-Fumarat, - Phosphat, -Maleat oder -Succinat, auch in Ein-tablettenregimen (TDF/FTC/RPV, TDF/FTC/EVG/c).
- Nicht bei HIV-RNA >100.000 Kopien/ml (keine Zulassung).

* /c: Cobicistat, #/r: Ritonavir; TAF = Tenofovir-Alafenamid, FTC = Emtricitabine, ABC = Abacavir, 3TC = Lamivudin; x: Anmerkungen zur Konsensklärung s. Text

Deutsch-Österreichische Leitlinien zur antiretroviralen Therapie der HIV-Infektion (April, 2019)

Regimens for Treatment-Naive Patients (DHHS & IAS-USA)

	DHHS		IAS-USA	
INSTI-based	RAL	+ (TAF or TDF) + (FTC or 3TC)	DTG	+ (TAF / FTC)
	DTG		BIC	
	BIC	/ TAF / FTC	DTG	/ ABC / 3TC
DTG	/ ABC / 3TC	DTG	/ ABC / 3TC	
NNRTI based	None			
Boosted-PI based	None			

DHHS: <https://aidsinfo.nih.gov/contentfiles/lvguidelines/adultandadolescentgl.pdf> (December 2019)
IAS-USA: JAMA. 2018;320(4):379-396.

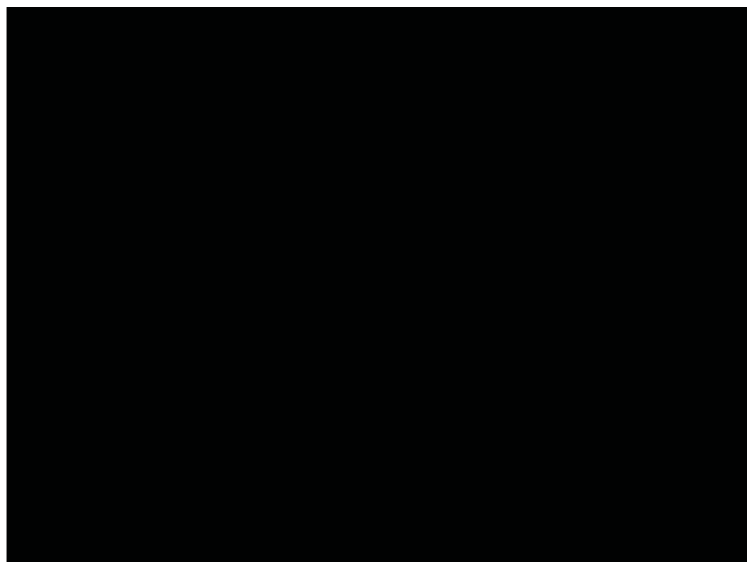
Choosing antiretroviral agents

1 NNRTI + 2 NRTIs
1 PI + 2 NRTIs
1 II + 2 NRTIs

2 NNRTIs + 1 NRTI?
3 NRTI?

Combination formulation

Combivir	Zidovudine + lamivudine	1# BID
Kivexa	Abacavir + lamivudine	1# QD
Kaletra	Lopinavir + ritonavir	4# QD or 2# BID
Truvada	TDF + emtricitabine	1# QD
Atripla	TDF + emtricitabine + efavirenz	1# QD
Complera	TDF + emtricitabine + rilpivirine	1# QD
Stribild	TDF + emtricitabine + elvitegravir + cobicistat	1# QD
Triumeq	Abacavir + lamivudine + dolutegravir	1# QD
Odefsey	TAF + emtricitabine + rilpivirine	1# QD
Genvoya	TAF + emtricitabine + elvitegravir + cobicistat	1# QD
Biktarvy	TAF + emtricitabine + bictegravir	1# QD



疾管署抗人類免疫缺乏病毒藥品處方使用規範 (109.12.01)

類別	處方(藥物品項)	
第一線推薦	TDF / FTC / EFV TAF / FTC / RPV TDF / 3TC / DOR	TAF / FTC / BIC ABC / 3TC / DTG DTG / 3TC
第一線替代	1. 藥價 13,200 元/月以下含三種藥品成分之口服處方組合 2. 藥價 10,800 元/月以下且核准使用於初服藥者之二合一口服藥	
第二線	藥價超過 13,200 元/月之口服處方組合	

注意事項：
一. 本規範將依預算核給、藥品上市及藥價調整情形適時檢討。
二. 斜線/表示複方，(數字)表示每日劑量。各藥品成分簡稱、學名及商品名之對照表如後附。
三. 處方前專業審查之條件，包括：(1)初次使用本規範之第二線處方，(2)第二線處方通過審查後，每次變更處方超過前次處方費用者，(3)使用不足三種藥品成分之口服處方組合(第一線處方及採處方後當期審查之二合一口服藥除外)。
四. 二合一口服藥(DTG/RPV)，轉換處方前不需提出前項專業審查，採處方後當期審查。病患轉換使用後應於下一次回診時檢測病毒量，以監測治療狀況；若該次檢測超過「全民健康保險醫療服務給付項目及支付標準」規定之次數，其費用由其他管道支付。
五. 有關藥品使用注意事項，請參照台灣愛滋病學會所訂之「愛滋病檢驗及治療指引」。

Ambitious treatment target by 2020 (UNAIDS)

WHO Goal

Target	Global 2020	Taiwan 2019
90% of all living with HIV will know their HIV status	81%	87%
90% of all living with HIV will receive sustained antiretroviral therapy	67%	90%
90% of all receiving antiretroviral therapy will have durable viral suppression	59%	95%