C肝簡易治療模式 & 再感染族群

台中榮民總醫院嘉義分院
呂家嘉

2025/05/27

2022 WHO 指引更新[2]

外展服務
社區與基層醫療機構提供C型肝炎篩檢與治療

整合治療
整合C型肝炎照護鍊於基層醫療機構現存的照護系統中

任務分擔
非專科醫師進行C型肝炎的診斷與直接作用抗病毒藥品 (DAA) 的開立與治療

及時診斷
創新檢測 C 型肝炎 RNA 濃度

2013
全面實施核酸擴大試驗 (NAT)[1,3]

2016
- WHO宣示於2030年消除C型肝炎[2]

民國108年

2019
放寬C型肝炎篩檢補助
年滿40至60歲具原住民身分[5]
製作成人預防保健B、C型肝炎篩檢 / 陽性名冊
供地方衛生局肝炎防治策略參考[8]

「愛滋病檢驗及治療指引」提供臨床醫師參考，建議HIV感染者定期檢驗C型肝炎[8]

民國109年

2020
放寬C型肝炎篩檢補助
擴大補助45至79歲民眾[3]

民國110年

2021
健保醫療雲端查詢系統—B、C肝專區頁籤
診所醫師查看民眾之篩檢資格、用藥 / 檢驗 / 就醫紀錄與結果[9]

地方政府衛生局結合民間團體
舉辦教育訓練與衛教活動，提供同志族群、HIV 感染者、血液透析病人等疾病諮詢服務[3]

不限DAA之處方醫師專科資格[9]

健保給付 Reflex testing
篩檢C型肝炎抗體時，即採集足夠之血液檢體，當抗體檢出陽性時，利用剩餘檢體主動檢驗病毒量[9]

民國111年

2021
新增給付[5]
- Sofosbuvir/ velpatasvir/ voxilaprevir

放寬給付再次治療[5]
- Glecaprevir + Pibrentasvir
- Sofosbuvir/ velpatasvir
- Sofosbuvir/ velpatasvir/ voxilaprevir

2022
建立特殊族群的預防性與再感染策略，並與其他現有的常規檢查結合
特殊族群指高風險族群，如血液透析病人、社區 / 監護機構之靜脈注射藥癮者、未採取安全性行為之男男性行為 / 性工作者[1,10,11]

8
染症內科
師處方

民國112年

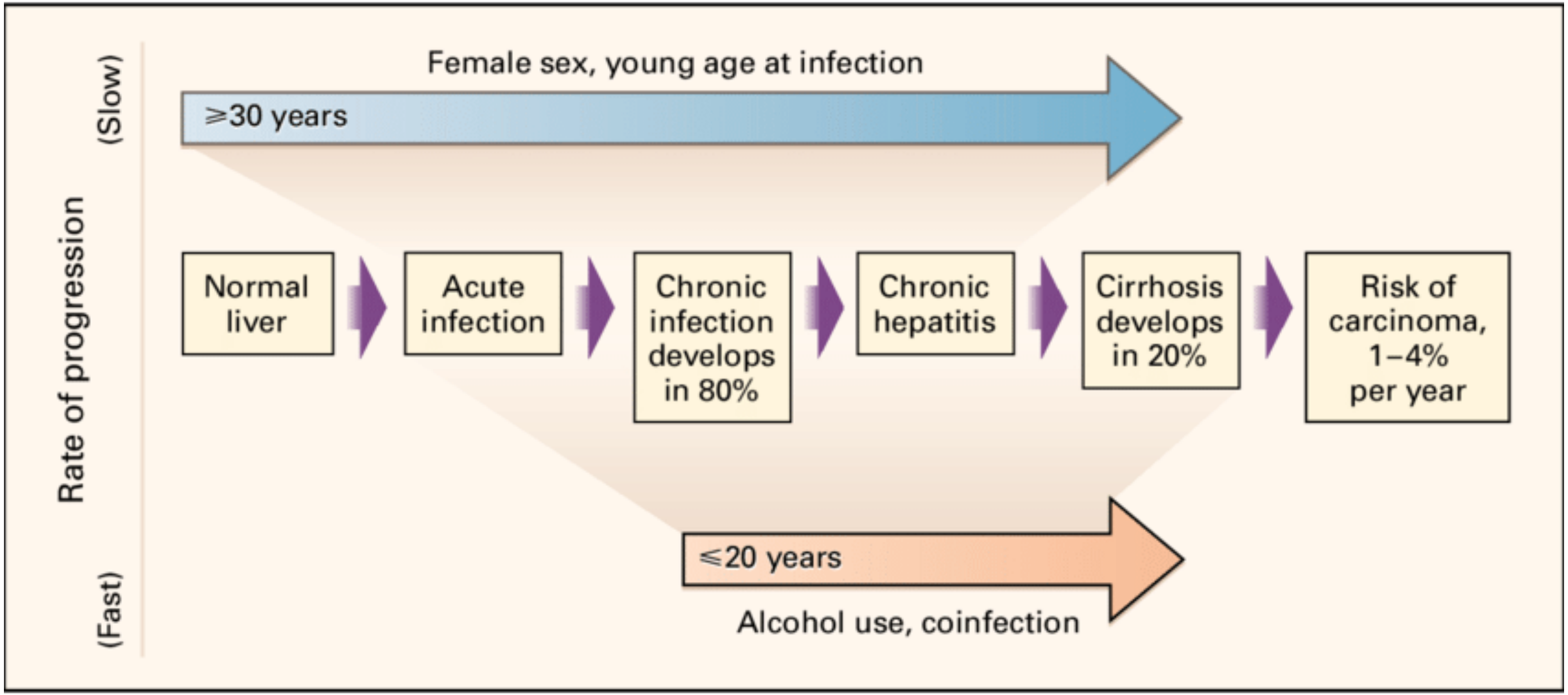
2023
臺灣成立「B、C 型肝炎防治辦公室」
呼應WHO 2030年消除病毒性肝炎之目標，一併納入B型肝炎防治任務[4]

民國114年

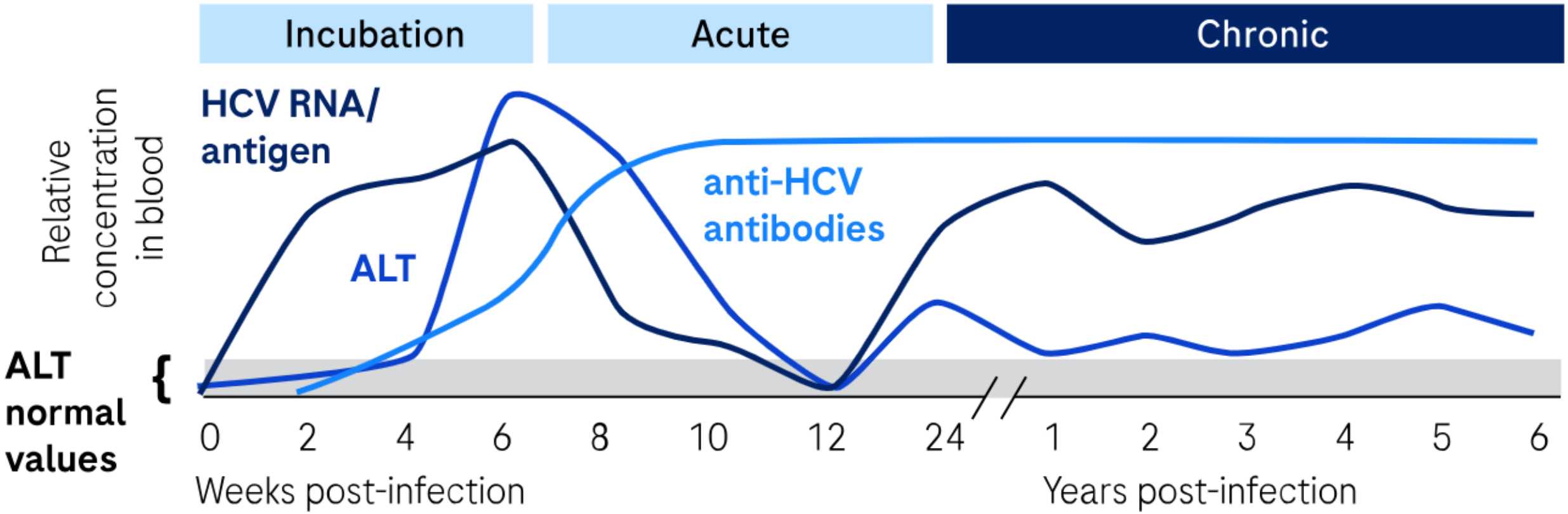
2025
臺灣達成消除C型肝炎目標[1]

大綱

- 流行病學與自然史
- HCV DAA 簡易治療
- Drug-Drug Interactions DDIs
- Reinfection
- 治療與追蹤建議



Georg M. Lauer, M.D., and Bruce D. Walker, M.D. Hepatitis C Virus Infection. N Engl J Med 2001;345:41-52



Roche; https://infectious-diseases-testing-guide.roche.com/test-hcv-suspectedacute

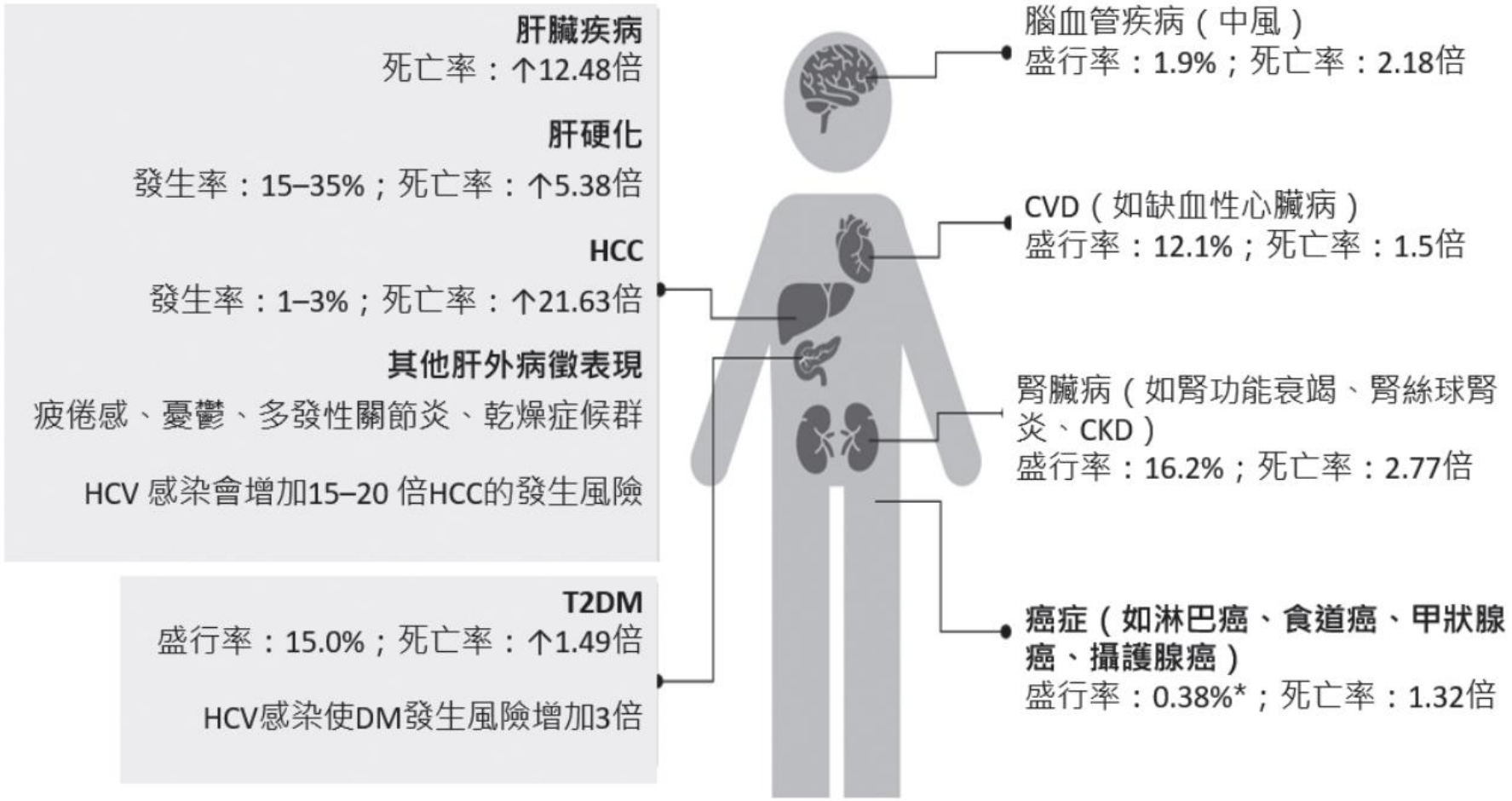


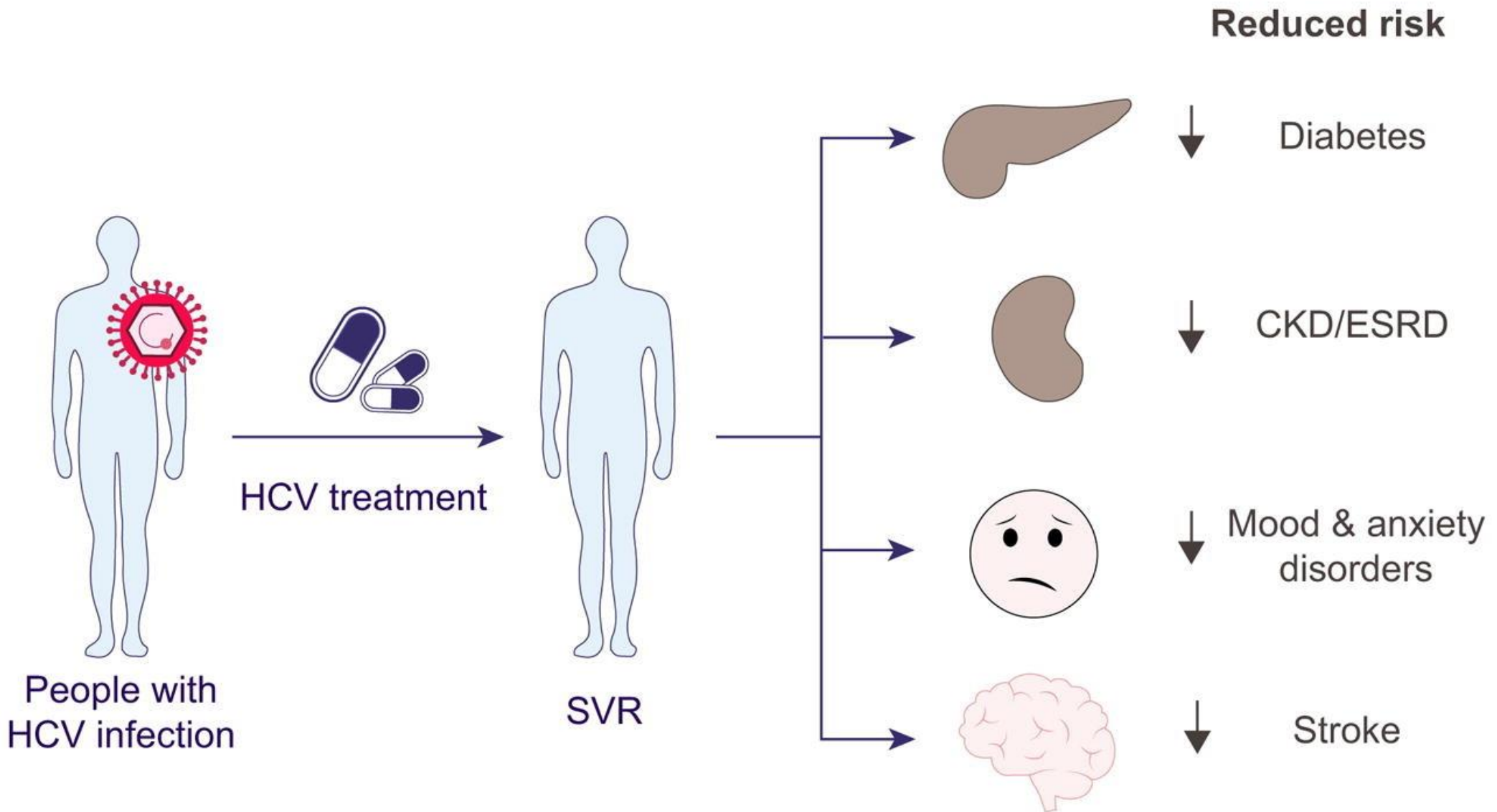
圖 1、HCV 的肝臟及肝外病徵表現之盛行率、發生率及死亡率。HCV 感染與肝臟及肝外的併發症相關。在肝臟病徵表現當中，肝硬化和肝癌分別是併發症與死亡的主要原因。在肝外病徵表現中，以心血管疾病及腎臟病最為常見[10, 14, 45, 101-103]**。**

*** 盛行率只適用於淋巴癌。**

CKD, chronic kidney disease; CVD, cardiovascular disease; HCC, hepatocellular carcinoma; HCV, hepatitis C virus; T2DM, type 2 diabetes mellitus.

TASL, TADE, and DAROC consensus for the screening and management of hepatitis C in patients with diabetes; Journal of the Formosan Medical Association 122 (2023) 202e220

Sustained virologic response from interferon-based Hepatitis C treatment is associated with reduced extrahepatic manifestations risk



Rossi C *et al* J Hepatol 2019. https://doi.org/10.1016/j.jhep.2019.07.021

表 2、HCV 抗病毒治療對於 DM 或其併發症與肝外癌症之益處。

HCV 相關併發症	HCV 抗病毒治療之益處
DM	改善血糖代謝指標，如 HbA1c 及空腹血糖 [17, 21-23]
糖尿病及 HCV 共病：	
• CKD	含 sofosbuvir 的治療可恢復慢性 HCV 感染合併 CKD 病人的腎功能 [75] HCV 治療期間，eGFR 上升 18% [96]
• HCV 共病	SOF/VEL 治療對台灣病人非常有效，無論何種病人族群，治癒率可達 99.4% [69] GLE/PIB 用於台灣病人的資料顯示 8 週治療的 SVR12 達成率為 98.8% [67]
• 肝臟併發症（HBV／HCV 合併感染）	干擾素治療可降低 HBV／HCV 合併感染和單獨 HCV 感染病人的主要肝臟相關併發症之長期風險 [97]
• 糖尿病前期血糖異常	糖尿病前期合併慢性 HCV 感染病人在成功根除 HCV 後，血糖異常獲得改善 [39]
• 重大心臟血管不良事件	顯著減少糖尿病前期病人的重大心臟血管不良事件發生風險 [98]
• 糖尿病視網膜病變	藉由改善血糖控制，間接改善糖尿病視網膜病變 [18, 99]
• 缺血性中風	顯著降低缺血性中風的發生風險 [18]
肝外癌症	根除 HCV 可降低非何杰金氏淋巴癌發生風險，顯示早期介入之重要性 [100] 肝外癌症風險下降 11% [100]

CKD, chronic kidney disease; DM, diabetes mellitus; eGFR, estimated glomerular filtration rate; GLE/PIB, glecaprevir/pibrentasvir; HbA1c, glycosylated hemoglobin; HBV, hepatitis B virus; HCV, hepatitis C virus; SOF/VEL, sofosbuvir/velpatasvir; SVR12, sustained virological response (at 12 weeks following treatment).

TASL, TADE, and DAROC consensus for the screening and management of hepatitis C in patients with diabetes; Journal of the Formosan Medical Association 122 (2023) 202e220

台灣C肝病人主要目標族群

未滿45歲

45歲以上

一般民眾

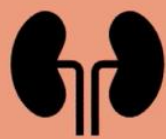
盛行率大多<1%

低風險地區 LV 0-3	中高風險地區 LV 4-5	高風險地區 LV 6-7

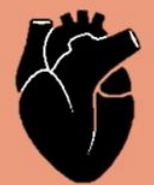
肝外共病

DM

CKD

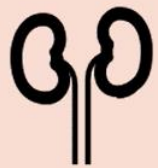


CVD



特殊族群

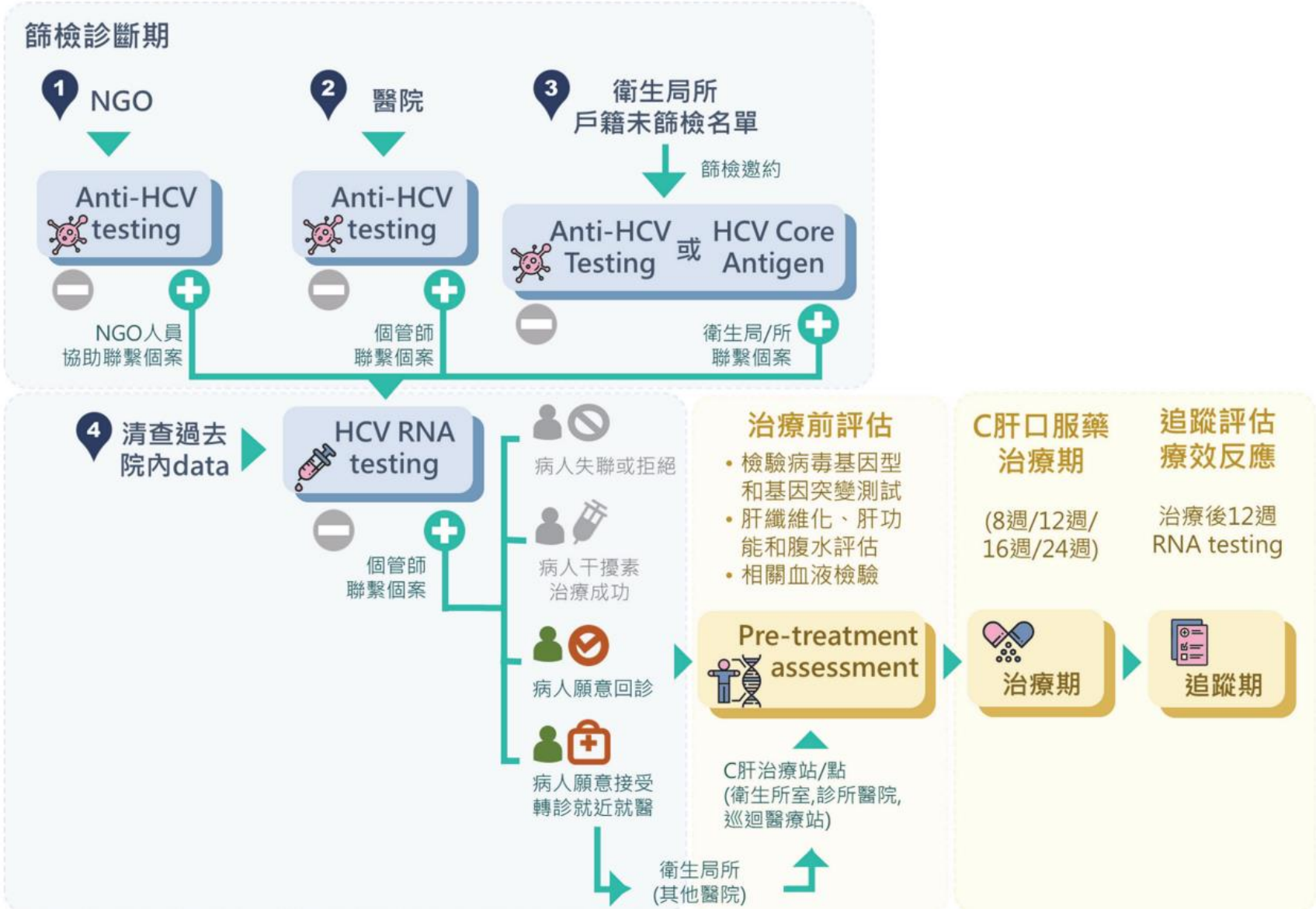
血液透析



PWID

HIV

監獄



Taiwan Hepatitis C Policy Guideline 2018-2025

項目	健保診察項目	項目代碼	次數	單位給付點數	總給付點數
1. 檢驗檢查費					
(1)RNA 定量測驗(治療前、結束、12W)	核糖核酸類定量擴增試驗	12185C	3	2,200	6,600
(2)基因型檢測	C 型肝炎病毒核酸基因檢測 - 即時聚合酉每連鎖反應法	12202B	1	2,450	2,450
(3)其他肝臟相關檢驗†					
A.治療前基礎檢驗					1,230
B.治療後 4 周					190
C.治療結束					190
D.結束後 12 周					820
(4)腹部超音波	腹部超音波（包括肝，膽囊,胰,脾，下腔靜脈，腹主動脈,腎及其他腹部超音波在內）	19001C	1	882	882
2. 診察藥事費					
門診 (第 0,2,4,8,12,+12 周)	一般門診診察費		6	260	1,560
門診藥事服務費 (第 0,2 周)	門診藥事服務費 (慢病處方 14 天)	05208D	2	24	48
門診藥事服務費 (第 4,8 周)	門診藥事服務費 (慢病處方 28 天)	05209A	2	75	150
合計					14,120

診察項目	項目代碼	給付點數	治療前	治療4週	治療結束	結束後12周
C型肝炎病毒抗體檢查	14072B	250	V			
血液一般檢查（白血球．紅血球及血色素）	08014C	50	V			V
白血球分類計數(中性白血球)	08013C	70	V			V
血小板計數	08006C	40	V			V
凝血酶原時間 (一段式)	08026C	150	V			V
白蛋白	09038C	40	V			V
血清麩胺酸苯醋酸轉氨基胺(GOT)	09025C	50	V	V	V	V
血清麩胺酸丙酮酸轉氨基胺(GPT)	09026C	50	V	V	V	V
膽紅素總量	09029C	50	V	V	V	V
直接膽紅素	09030C	40	V	V	V	V
甲型胎兒蛋白 AFP	12007C	200	V			V
血中尿素氮 BUN	09002C	40	V			V
肌酸酐 Creatinine	09015C	40	V			V
B型肝炎表面抗原 HBsAg (EIA/LIA)	14032C	160	V			
合計			1,230	190	190	820

C肝相關檢查－治療前VPN登錄要求項目

- 1. WBC
- 2.Neutrophils (非必要)
- 3. Hb
- 4. Platelet
- 5. PT
- 6. INR
- 7. GOT/AST
- 8. GPT/ALT
- 9. Total-Bilirubin
- 10. Direct-Bilirubin
- 11. AFP
- 12. BUN (非必要)
- 13. Creatinine
- 14. Albumin
- 15. HBsAg
- 16. Anti-HBsAb (非必要)
- 17. Anti-HBcAb (非必要)
- 18. 肝纖維化狀況(F0~F4)

常見的肝纖維化診斷方式：

FIB-4 → 公式計算

Fibroscan → 儀器

Biopsy → 肝臟切片

C肝相關檢查－治療中及治療後檢查

治療中(第4週)	治療結束(EOT)	治療結束後第12週(SVR12)	
GOT/AST	GOT/AST	WBC	Direct-Bilirubin
GPT/ALT	GPT/ALT	Neutrophils (非必要)	AFP
Total Bilirubin	Total Bilirubin	Hb	BUN (非必要)
Direct Bilirubin	Direct Bilirubin	Platelet	Creatinine
	HCV RNA	PT	Albumin
		INR	HCV RNA
		GOT/AST	
		GPT/ALT	
		Total-Bilirubin	

健保VPNC肝個案登錄系統

Evolution of WHO HCV Guidelines Towards Simplified HCV Service Delivery

Topic	2014	2016	2018	2022
Who to treat?			Treat All	Treat All
Genotyping	Yes	Yes	No	No
Regimens	PEG-IFN+RBV	DAAs preferred	Pan-genotypic DAAs	Pan-genotypic DAAs
	8 options - PEGIFN+RBV - SOF+RBV - SIMP or TELAP or BOCEP /PEGIFN+RBV	6 options DAAs preferred by GT or cirrhosis	3 options SOF/DAC SOF/VEL G/P PEGIFN phase out	3 options SOF/DAC SOF/VEL G/P
Age group	Adults ≥18yrs	Adults≥ 18yrs	Adults ≥18yrs and adolescents ≥12 yrs	Adults, adolescents and children≥3 yrs
Service Delivery			8 Good Practice Principles for Simplified Service	Decentralization Integration Task-shifting

SIMPLER TREATMENTS

TREATMENT OF CHILDREN AND ADOLESCENTS

SIMPLIFIED SERVICE DELIVERY

Who is Eligible for Simplified HCV Treatment Algorithm

Adults with chronic HCV infection, including persons living with HIV:

- Infected with any genotype
- Have not previously received HCV treatment
- Without cirrhosis or with compensated cirrhosis (Child-Pugh A) as determined by:
  - Liver stiffness >12.5 kPa by FibroScan
  - FIB-4 >3.25
  - Noninvasive serologic test[a]
  - Liver biopsy
  - Liver nodularity or splenomegaly on imaging
  - Platelet count <150,000/mm^3

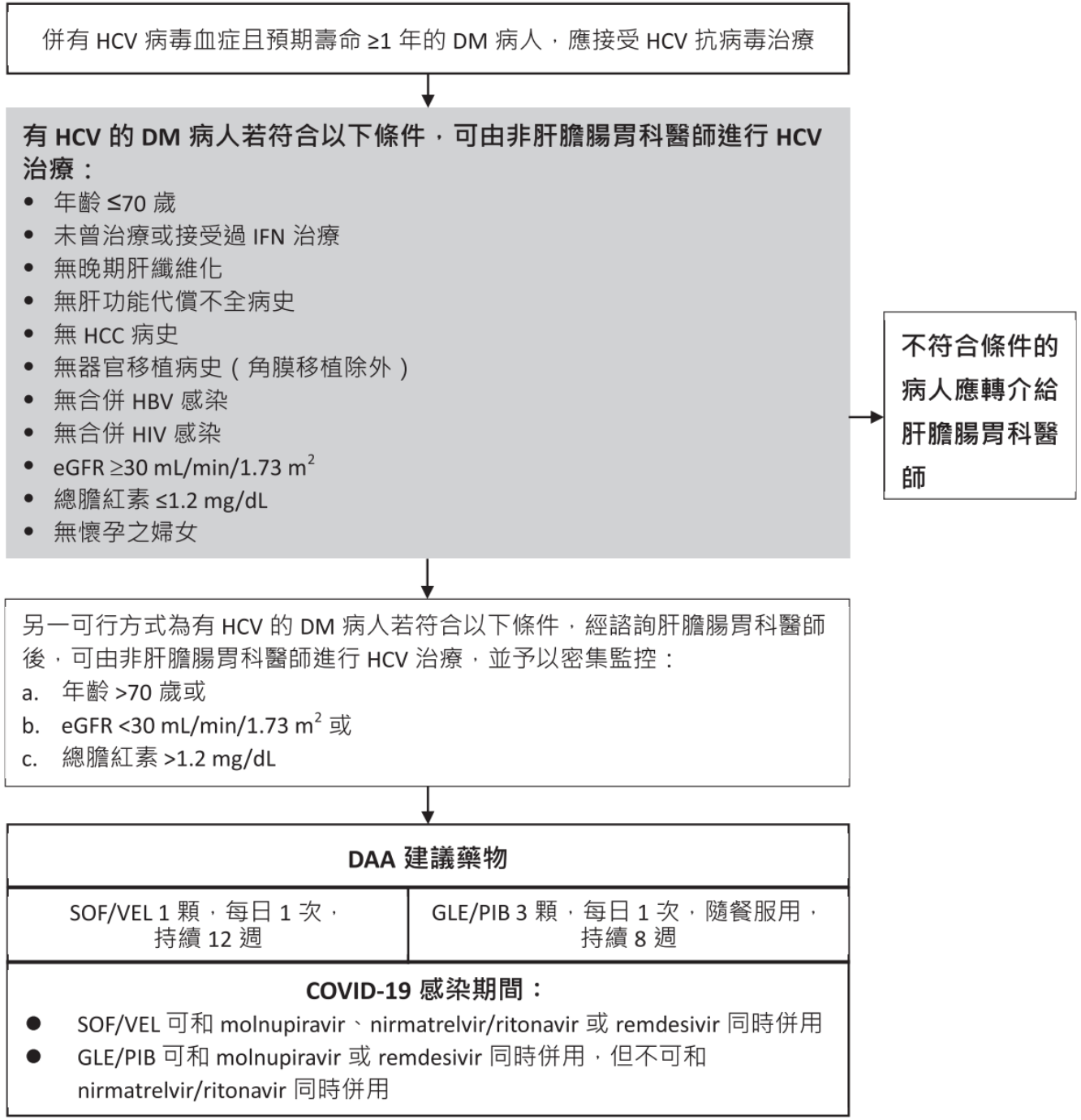
Who is Excluded from Simplified HCV Treatment Algorithm

Adults with chronic HCV infection:

- Previously received HCV treatment
- Hepatitis B surface antigen-positive
- Compensated cirrhosis (Child-Pugh A) with end-stage renal disease (eGFR <30 mL/min/m^2)
- Current or prior decompensated cirrhosis, defined by Child-Pugh score ≥7[b]
- Current pregnancy
- Known or suspected hepatocellular carcinoma
- Prior liver transplantation

Figure 3. Inclusion and exclusion criteria for simplified HCV treatment algorithm. Abbreviations: eGFR, estimated glomerular filtration rate; FIB-4, fibrosis-4 index for liver fibrosis; HCV, hepatitis C virus. [a]Noninvasive serologic tests include HCV FibroSure or enhanced liver fibrosis test. [b]Child–Pugh score based on presence of ascites, hepatic encephalopathy, total bilirubin >2.0 mg/dL, albumin ≤3.5 g/dL, or international normalized ratio ≥1.7.

IDSA GUIDELINES Hepatitis C Guidance 2023 Update: American Association for the Study of Liver Diseases– Infectious Diseases Society of America Recommendations for Testing, Managing, and Treating Hepatitis C Virus Infection



TASL, TADE, and DAROC consensus for the screening and management of hepatitis C in patients with diabetes; Journal of the Formosan Medical Association 122 (2023) 202e220

immunosuppressive therapy

Risk level- high (>10%)

HBsAg(+)	HBsAg(-)/anti-HBc(+)

• Anti-CD20 monoclonal antibodies: Rituximab, Ofatumumab, Obinutuzumab
• Hematopoietic stem cell transplantation (both allogeneic and autologous)
• Steroid (high dose) ≥ 20 mg/day for ≥ 4 weeks
• Anti-TNF agents with higher potency: Adalimumab, Infliximab, Golimumab, Certolizumab
• Anthracyclines
• **DAA for HBV/HCV coinfection, except non-cirrhotics with HBsAg < 10 IU/ml**
• Immune Checkpoint inhibitors (moderate to high risk):
  ○ Anti-PD-1: nivolumab, pembrolizumab
  ○ Anti-PD-L1: atezolizumab
  ○ Anti-CTLA-4: ipilimumab
  ○ Tyrosine kinase inhibitors (moderate-to-high): Imatinib, Nilotinib, Dasatinib, Erlotinib, Gefitinib, Osimertinib, Afatinib
	• Anti-CD20 monoclonal antibodies: Rituximab, Ofatumumab, Obinutuzumab
	• Allogeneic hematopoietic stem cell transplantation

au et al., Hepatol Int 2021 Oct;15(5):1031-1048

Moderate (1–10%)

HBsAg(+)	HBsAg(-)/anti-HBc(+)
• Cytotoxic chemotherapy (except anthracyclines) • Anti-TNF agents with lower potency: Etanercept • Steroid (median dose): 10–20 mg/day for ≥ 4 weeks • Proteasome inhibitor: Bortezomib Ustekinumab	• Anthracyclines • Autologous hematopoietic stem cell transplantation • Anti-TNF agents with higher potency: Adalimumab, Infliximab, Golimumab, Certolizumab • Proteasome inhibitor: Bortezomib Ustekinumab

Low (< 1%)

HBsAg(+)	HBsAg(-)/anti-HBc(+)
• Methotrexate • Azathioprine • Steroid (low dose < 10 mg/day) • **DAA for HBV/HCV coinfection for non-cirrhotic patients with HBsAg < 10 IU/ml**	• Cytotoxic chemotherapy (except anthracyclines) • Steroid (high dose) ≥ 20 mg/day • Anti-TNF agents with lower potency: Etanercept • Tyrosine kinase inhibitors Imatinib, Nilotinib, Dasatinib • **DAA for HCV**

Evaluation liver fibrosis

Advantages and disadvantages of noninvasive methods to evaluate liver fibrosis

Parameters	Transient elastography	pARFI	2D-SWE	MR elastography	Serum biomarkers
Advantages	High accuracy, rapid results	High accuracy	High accuracy	High accuracy	Availability
	Reproducibility	Reproducibility	Reproducibility	Reproducibility	Reproducibility
	Very easy to learn	Easy to learn	Easy to learn, larger measurement area than other ultrasound techniques	Examination of the whole liver	Biomarker indices (APRI, FIB-4 and GPR) are low cost and easy to calculate*
		Conventional ultrasound images are also obtained	Conventional ultrasound images are also obtained	Conventional MR images are also obtained	Biomarker indices can be performed in real-time
		Obesity and ascites are not limiting	Ascites is not limiting	Obesity and ascites are not limiting	
Disadvantages	Technical requirements (elastography equipment)	Technical requirements (ultrasound equipment)	Technical requirements (ultrasound equipment)	Technical requirements (MR imaging equipment)	Nonspecific (eg, hyperbilirubinemia, hemolysis, inflammation)
	Intermediate cost	Intermediate cost	Intermediate cost	High cost, time-consuming	Proprietary biomarker panels are relatively high cost
	Limited recognition of intermediate stages of fibrosis	Limited recognition of intermediate stages of fibrosis	Limited recognition of intermediate stages of fibrosis	Limited recognition of intermediate stages of fibrosis	Limited recognition of intermediate stages of fibrosis
	Blind selection of measurement area			Not applicable in case of iron deposition	Results from proprietary tests not immediately available
	Restricted value in patients with obesity or ascites	Narrow range of values, small measurement area		Potential need for sedation	
	False positive values in patients with acute hepatitis, cholestasis, and heart failure	Quality criteria not well-defined	Quality criteria not well-defined		

2D-SWE: two-dimensional shear wave elastography; APRI: aspartate aminotransferase to platelet ratio; FIB-4: index combining three biochemical values (platelet count, alanine aminotransferase, aspartate aminotransferase) and age; GPR: gamma-glutamyl transpeptidase to platelet ratio; MR: magnetic resonance; pARFI: point-shear wave elastography using acoustic radiation force impulse.

* For details on these biomarker indices of fibrosis, refer to UpToDate content on noninvasive assessment of hepatic fibrosis.

Reference:

1. *Cui XW, Friedrich-Rust M, De Molo C, et al. Liver elastography, comments on EFSUMB elastography guidelines 2013. World J Gastroenterol 2013; 19:6329.*

Fibrosis-4 (FIB-4) Index for Liver Fibrosis

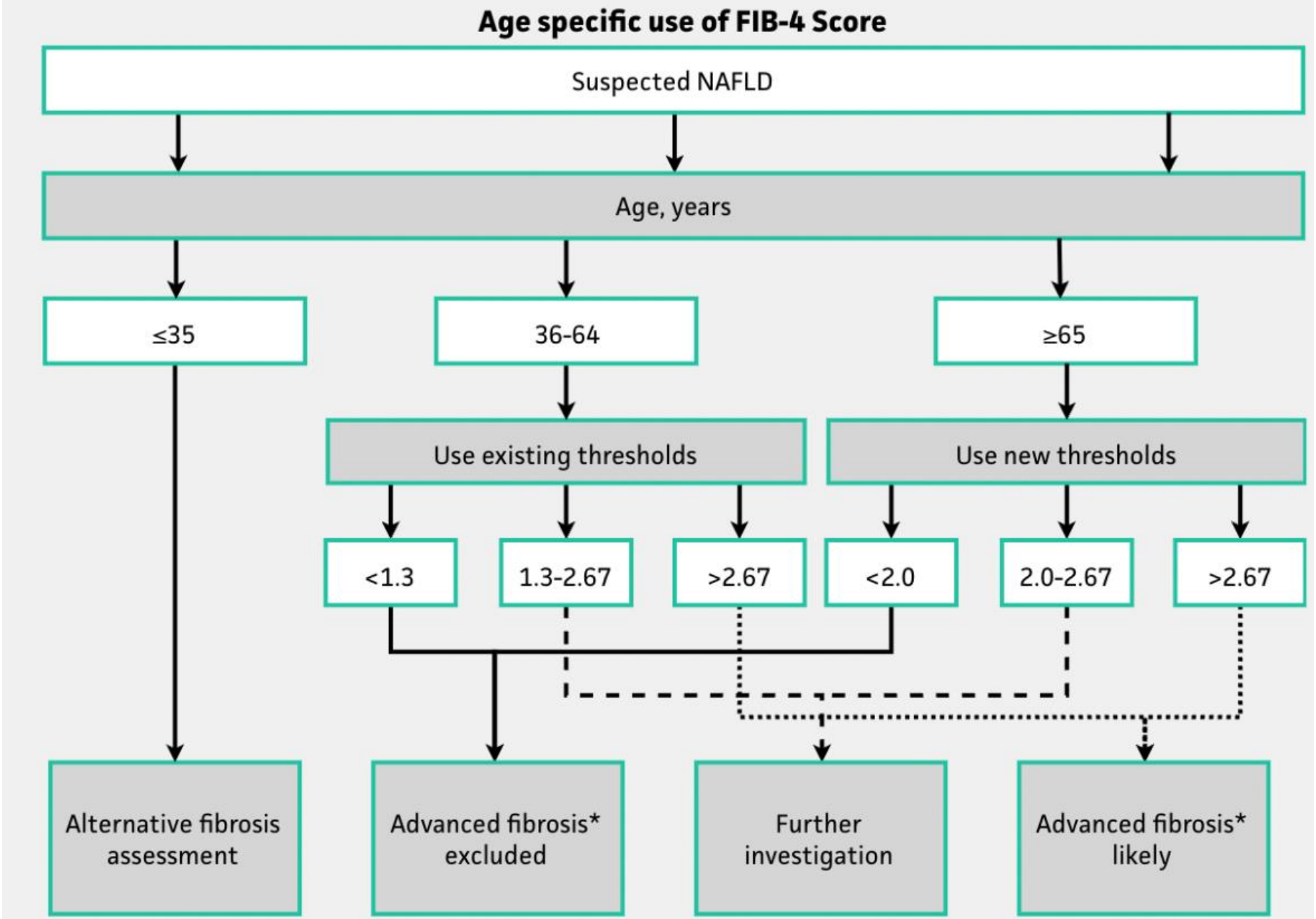
FORMULA

FIB-4 Score = (Age* x AST) / (Platelets x $\sqrt{(ALT)}$)

*Use with caution in patients <35 or >65 years old, as the score has been shown to be less reliable in these patients.

old, as the score has been shown to be less reliable in these patients

AST Aspartate aminotransferase	Norm: 15 - 41	U/L
ALT Alanine aminotransferase	Norm: 1 - 35	U/L
Platelet count	Norm: 150 - 350	× 10^3/µL ⇋



*"Advanced fibrosis" was defined as METAVIR stage F3-F4 (McPherson 2017).

Child-Pugh classification of severity of cirrhosis

Parameter	Points assigned		
	1	2	3
Ascites	Absent	Slight	Moderate
Bilirubin	<2 mg/dL (<34.2 micromol/L)	2 to 3 mg/dL (34.2 to 51.3 micromol/L)	>3 mg/dL (>51.3 micromol/L)
Albumin	>3.5 g/dL (35 g/L)	2.8 to 3.5 g/dL (28 to 35 g/L)	<2.8 g/dL (<28 g/L)
Prothrombin time (seconds over control) or	<4	4 to 6	>6
INR	<1.7	1.7 to 2.3	>2.3
Encephalopathy	None	Grade 1 to 2	Grade 3 to 4

Modified Child-Pugh classification of the severity of liver disease according to the degree of ascites, the serum concentrations of bilirubin and albumin, the prothrombin time, and the degree of encephalopathy. A total Child-Pugh score of 5 to 6 is considered Child-Pugh class A (well-compensated disease), 7 to 9 is class B (significant functional compromise), and 10 to 15 is class C (decompensated disease). These classes correlate with one- and two-year patient survival: class A: 100 and 85%; class B: 80 and 60%; and class C: 45 and 35%.

INR: international normalized ratio.

歐洲肝病學會C型肝炎治療建議指引
(以全基因型藥物為首選)

Type of treatment	Genotype	Cirrhosis status	Prior treatment experience	Sofosbuvir/ velpatasvir	Glecaprevir/ pibrentasvir	Sofosbuvir/ velpatasvir/ voxilaprevir	Grazoprevir/ elbasvir
Simplified treatment, no genotype/subtype determination[a]	All genotypes	No cirrhosis	Treatment-naïve	12 weeks	8 weeks	No	No
			Treatment-experienced				
		Compensated (Child-Pugh A) cirrhosis)	Treatment-naïve				
			Treatment-experienced		12 weeks		

Recommendations for simplified, genotyping/subtyping-free treatment of HCV-monoinfected or HCV-HIV coinfected adult (≥18 years) and adolescent (12–17 years) patients with chronic hepatitis C without cirrhosis or with compensated (Child-Pugh A) cirrhosis, including treatment-naïve patients (defined as patients who have never been treated for their HCV infection) and treatment-experienced patients (defined as patients who were previously treated with pegylated IFN-a and ribavirin; pegylated IFN-a, ribavirin and sofosbuvir; or sofosbuvir and ribavirin).

Table 2

全基因型藥物 Maviret® Epclusa®[5]

艾百樂
(Maviret，Abbvie藥廠)

成分	Glecaprevir 100mg + Pibrentasvir 40mg	Sofosbuvir 400mg + Velpatasvir 100mg
基因型	1,2,3,4,5,6	1,2,3,4,5,6
療程	一般為8週。某些情況（例：有代償性肝硬化者、基因型第三型等），需延長至12或16週。	12週。 若為失代償性肝硬化患者，需併服Ribavirin。
劑量	每日一次，隨餐服用三錠。	一天一錠；可空腹食用，不限服藥時機。
重度腎功能不全 (eGFR<30)	可以使用。 （因為90%以上由糞便排除）	不建議使用。 （因尚未有安全性與療效評估）
已有失代償性肝硬化者可否使用	不行	可以（若有不適合併用雷巴威林Ribavirin之狀況：貧血、腎功能不佳等，需延長療程至24週）
副作用	可能於初期有稍微頭痛、疲倦感或腸胃不適。停藥後副作用緩解。	
可否剝半、磨粉	可以	因有苦味，建議不要嚼碎或研碎使用。
忘記服藥怎麼辦	※離預定服藥時間未超過 18 小時：儘快服用錯過的劑量，並依一般服藥時間服用下次劑量即可。 ※如果已經超過 18 小時，跳過此次劑量，直接於一般用藥時間服用下次劑量。	
交互作用	以下禁止併服：特定抗凝血藥、特定抗血脂藥、特定抗HIV病毒藥、特定抗分枝桿菌劑等。	以下不建議併服： PPIs（質子幫浦抑制劑）：若必須併用，建議使用PPI前4小時隨餐給與Epclusa。 Amiodarone：可能造成嚴重心跳徐緩)。 某些抗癲癇藥物：為強力P-gp、CYP450誘導劑，會降低Epclusa療效。

註1：eGFR：推估的腎絲球過濾率。
註2：P-gp：P醣蛋白，廣泛存在小腸、腎小管等正常細胞的細胞膜，為轉運蛋白，促進某些藥物排出細胞外。
註3：CYP450：細胞色素P450，存在人體內的酵素，將某些藥物氧化成較水溶性的物質，促進藥物的排除。

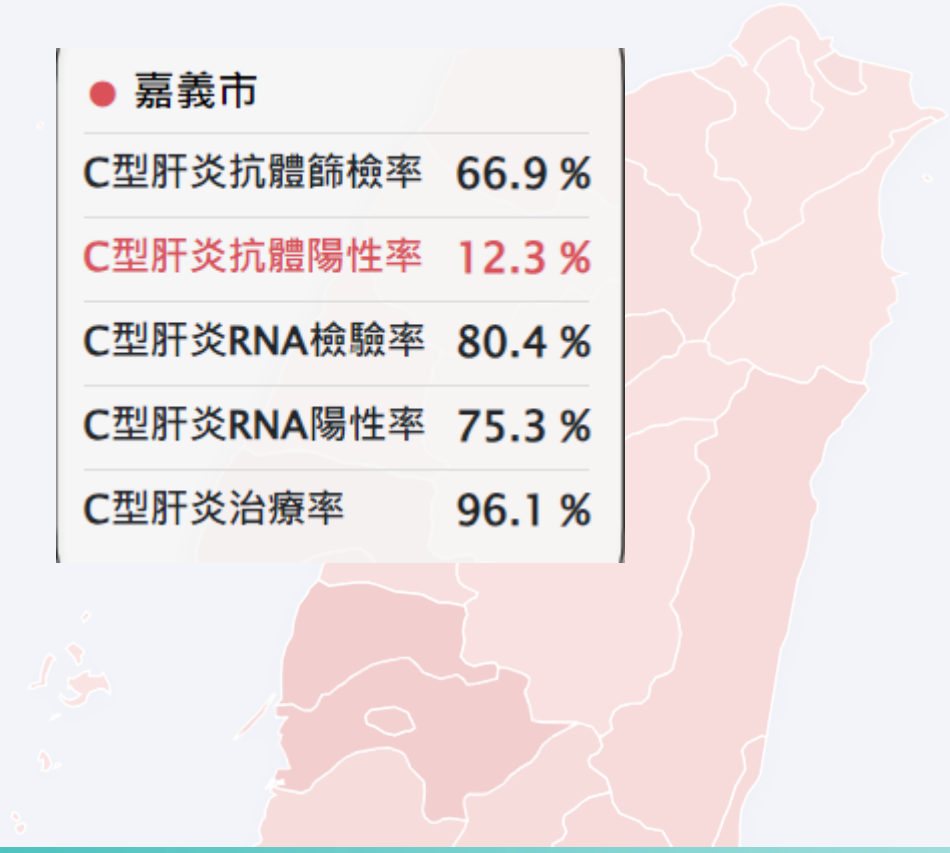
C型肝炎
抗體篩檢率

C型肝炎
抗體陽性率

C型肝炎
RNA檢驗率

C型肝炎
RNA陽性率

C型肝炎
治療率



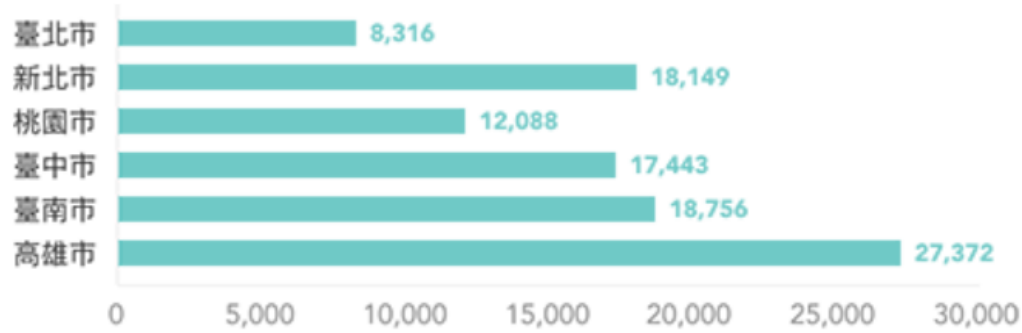
嘉義市	
C型肝炎抗體篩檢率	66.9 %
C型肝炎抗體陽性率	12.3 %
C型肝炎RNA檢驗率	80.4 %
C型肝炎RNA陽性率	75.3 %
C型肝炎治療率	96.1 %

C型肝炎抗體篩檢率	C型肝炎RNA檢驗率	C型肝炎治療率
57.9%	79.5%	95.3%

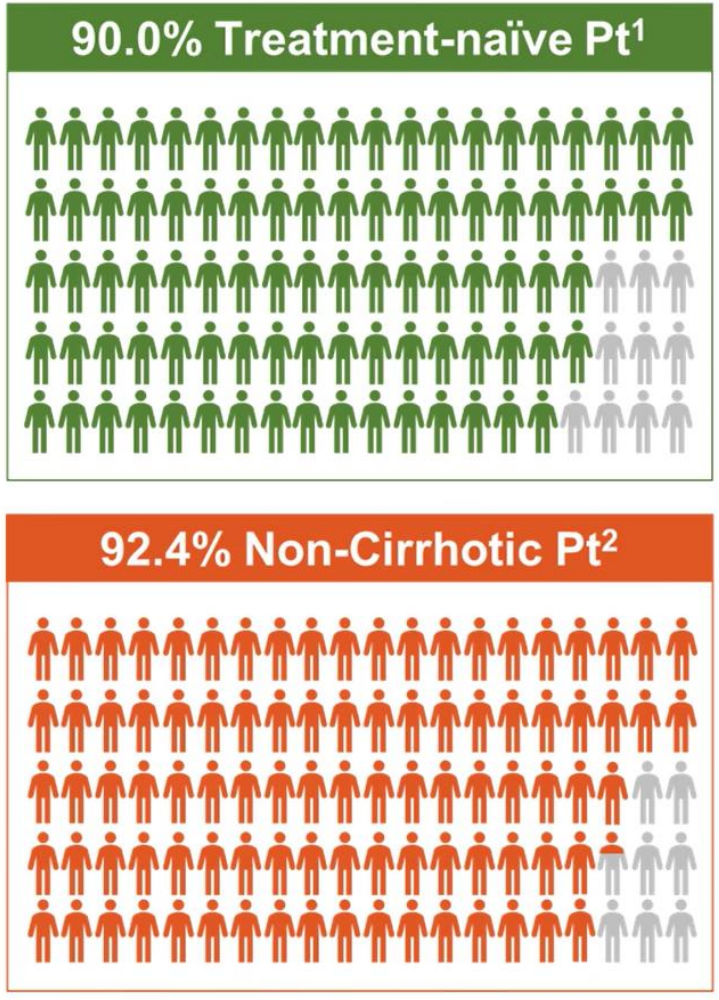
45-79歲人口數[2]	C型肝炎抗體篩檢人數[3]	C型肝炎RNA檢測人數[3]	治療人數(含DAA及干擾素治療)[3]
10,578,739 人	6,129,507 人	304,962 人	180,678 人

1. ML Yu, et al. Huge gap between clinical efficacy and community effectiveness in the treatment of chronic hepatitis C: a nationwide survey in Taiwan. Medicine 2015 (94): 13: e690
2. 年齡符合45-79歲的民眾，政府提供終身一次免費B、C型肝炎篩檢。
3. 篩檢及治療之總人數，包含所有45-79歲之對象。

全臺灣各縣市C肝消除進展總覽



台灣現今的 HCV 病人逐漸朝向以 Treatment-Naive, Non-Cirrhotic 病人為主



病人肝纖維化程度逐漸輕微[1,2]

簡化療程加速達標[3]

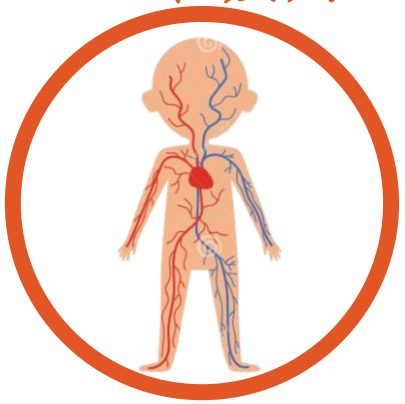
1.This graph is illustration only, and not present the actual proportion. TE, treatment experience, PR, PEG-IFN and ribavirin

3.AASLD and IDSA. Simplified HCV treatment algorithm for treatment-naive adults without cirrhosis. 2020. Available at: https://www.hcvguidelines.org/sites/default/files/full-

台灣 C 型肝炎病人常見的共病

消化性疾病

心血管疾病

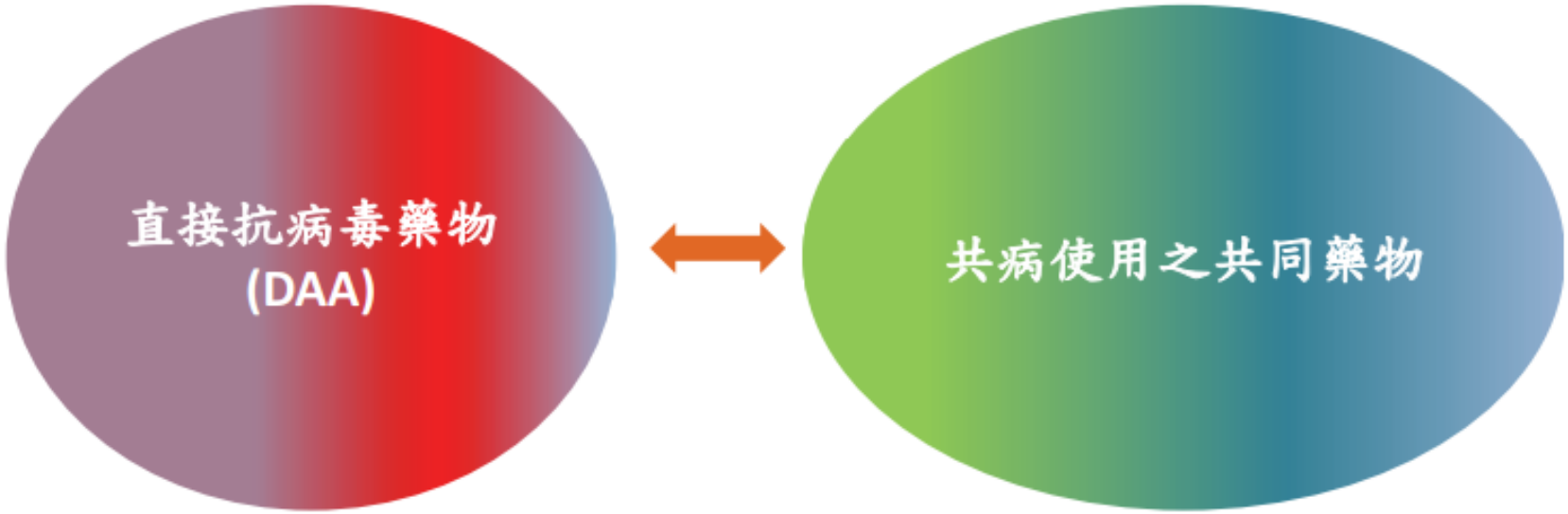


綜合性代謝疾病

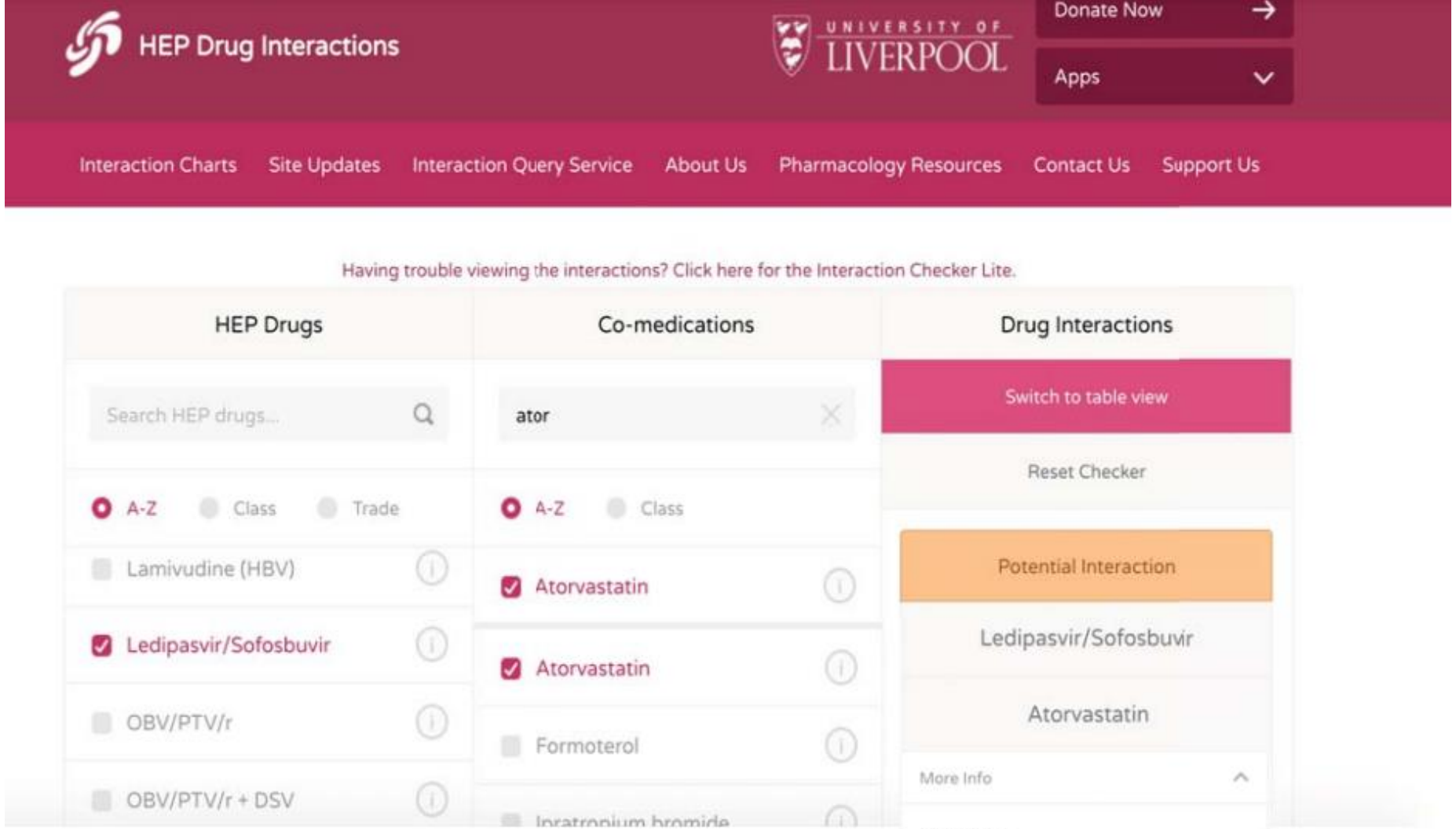
Year of study enrollment	Prevalence of comorbidity		
2016 [1]	40.1%	38.7%	35.2%
2016 -2018 [2]	37.4%	43.9%	36.7%
2018 – 2019 [3]	58.8%	72.1%	50.8%

1. Liu, Chen-Hua, et al. Alimentary pharmacology & therapeutics 48.11-12 (2018): 1290-1300.
2. Liu, Chun-Jen, et al. Journal of the Formosan Medical Association 119.5 (2020): 933-940.
3. Kuo, Meng Hsuan, et al. Journal of the Formosan Medical Association 121(2022):58-65

C型肝炎直接抗病毒藥物與其他合併藥物之交互作用



機轉	效應		效應
誘發肝臟酵素	直接抗病毒藥物引起		藥物濃度下降
抑制肝臟酵素			藥物濃度上升
誘發肝臟酵素	藥物濃度下降		合併藥物引起
抑制肝臟酵素	藥物濃度上升		
競爭受質	藥物濃度上升		藥物濃度上升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Lamivudine (HBV)
Atorvastatin
Ledipasvir/Sofosbuvir
Atorvastatin
Potential Interaction
Ledipasvir/Sofosbuvir
OBV/PTV/r
Formoterol
Atorvastatin
OBV/PTV/r + DSV
Ipratropium bromide
More Info
Summary:
Coadministration has not been studied but may increase atorvastatin concentrations due to inhibition of P-gp and/or BCRP by ledipasvir. A dose reduction of atorvastatin may be required, monitor lipid levels and CK and increased side effects of atorvastatin such as muscle pain.
Description:
(See Summary)

藥物類別／機轉	學名	SOF/VEL	GLE/PIB
a-glucosidase inhibitor (AGI)	Acarbose	O	O
Biguanide	Metformin	O	O
Dipeptidyl peptidase-4 (DPP-4) inhibitors	Alogliptin	O	O
	Linagliptin	O	O
	Saxagliptin	O	O
	Sitagliptin	O	O
	Vildagliptin	O	V
Glinides	Nateglinide	O	O
	Repaglinide	V	U
Glucagon-like peptide-1 (GLP-1) receptor agonists	Dulaglutide	U	V
	Liraglutide	U	V
	Lixisenatide	O	O
	Semaglutide	O	O
Hormone	Insulin	O	O
Sodium-glucose cotransporter-2 (SGLT2) inhibitors	Canagliflozin	O	O
	Dapagliflozin	O	O
	Empagliflozin	U	O
	Ertugliflozin	NA	NA
Sulfonylureas (SUs)	Glibenclamide	O	U
	Gliclazide	O	O
	Glimepiride	O	O
Thiazolidinediones (TZDs)	Pioglitazone	O	O
	Rosiglitazone	O	O

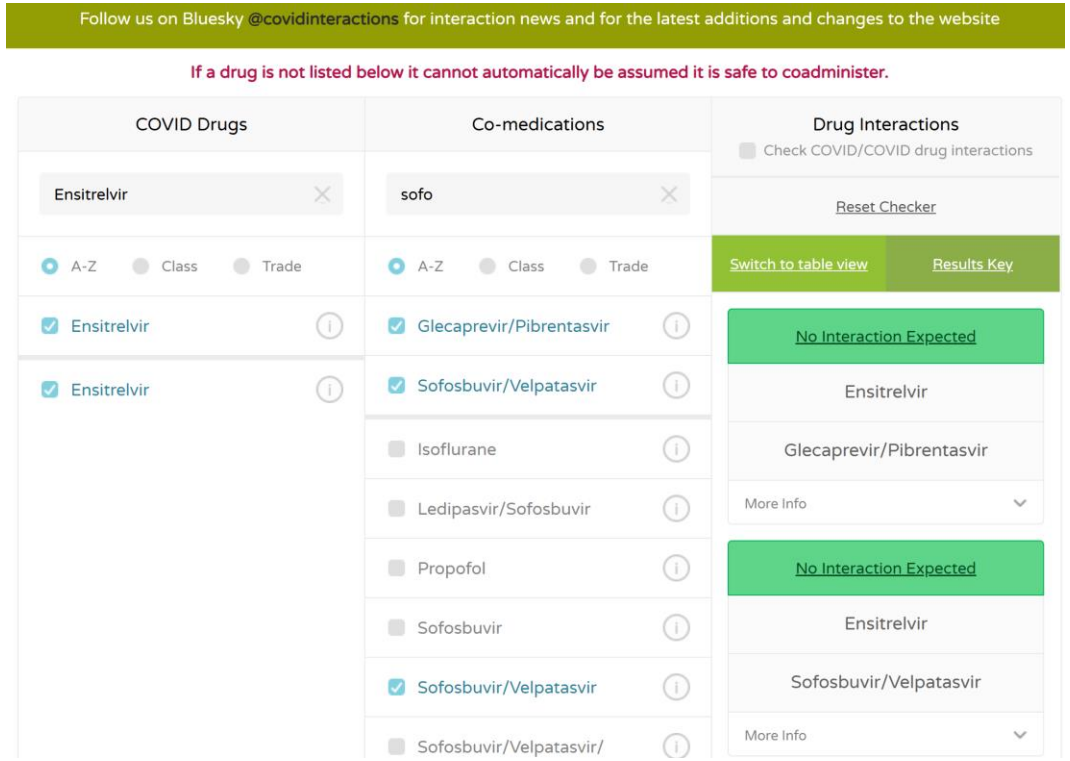
藥物類別／機轉	學名	SOF/VEL	GLE/PIB
Angiotensin-converting enzyme (ACE) inhibitors	Benazepril	O	O
	Captopril	O	O
	Enalapril	O	U
	Fosinopril	O	O
	Lisinopril	O	O
	Perindopril	O	O
	Quinapril	O	O
	Ramipril	O	O
	Trandolapril	O	O
Aldosterone antagonist	Spironolactone	O	O
Angiotensin II receptor blockers (ARBs)	Candesartan	O	V
	Losartan	O	O
	Olmesartan	O	U
	Telmisartan	O	U
a1-adrenergic antagonist	Doxazosin	O	O
β-adrenergic antagonists	Acebutolol	O	O
	Atenolol	O	O
	Bisoprolol	O	O
	Carvedilol	U	U
	Metoprolol	O	O
	Propranolol	O	O
Diuretics	Amiloride	O	O
	Bumetanide	O	O
	Furosemide	O	O
	Metolazone	O	O
	Torsemide	NA	NA

藥物類別／機轉	學名	SOF/VEL	GLE/PIB
Fibrates	Bezafibrate	O	O
	Fenofibrate	O	O
	Gemfibrozil	O	U
HMG-CoA reductase inhibitors	Atorvastatin	U	X
	Fluvastatin	U	U
	Lovastatin	U	X
	Pitavastatin	U	U
	Pravastatin	O	U
	Rosuvastatin	U	U
	Simvastatin	U	X
Selective cholesterol absorption inhibitor	Ezetimibe	O	U

藥物類別／機轉	學名	SOF/VEL	GLE/PIB
Antiarrhythmics	Amiodarone	X	U
	Digoxin	U	U
	Flecainide	O	O
Calcium channel blockers	Amlodipine	O	O
	Diltiazem	U	U
	Nifedipine	O	O
Antiplatelets and anticoagulants	Clopidogrel	O	O
	Dabigatran	U	X
	Ticagrelor	U	U
	Rivaroxaban	U	U
	Apixaban	U	U
	Edoxaban	U	U
	Warfarin	U	U

COVID-19

- SOF/VEL 可與molnupiravir, nitmatrelvir/ritonavir, remdesivir, 併用
- GLE/PIB可與molnupiravir, remdesivir; 不可與nitmatrelvir/ritonavir併用
- XOCOVA(Ensitrelvir)



HCV reinfection and surveillance

- Studies in Taiwan estimate an annual HCV reinfection rate of 5.8–9.8% among people living with HIV (PLWH) after completing anti-HCV treatment
- Preventing reinfections among high-risk individuals becomes crucial for the long-term success of the elimination program

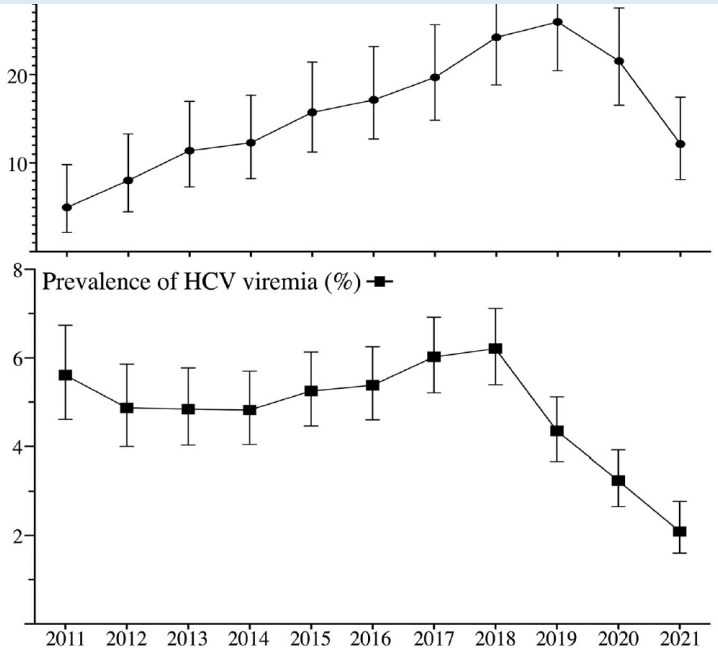


Figure 3. The evolution of the incidence and prevalence of HCV viremia during 2011–2021 among people living with HIV. PYFU, person-years of follow-up.

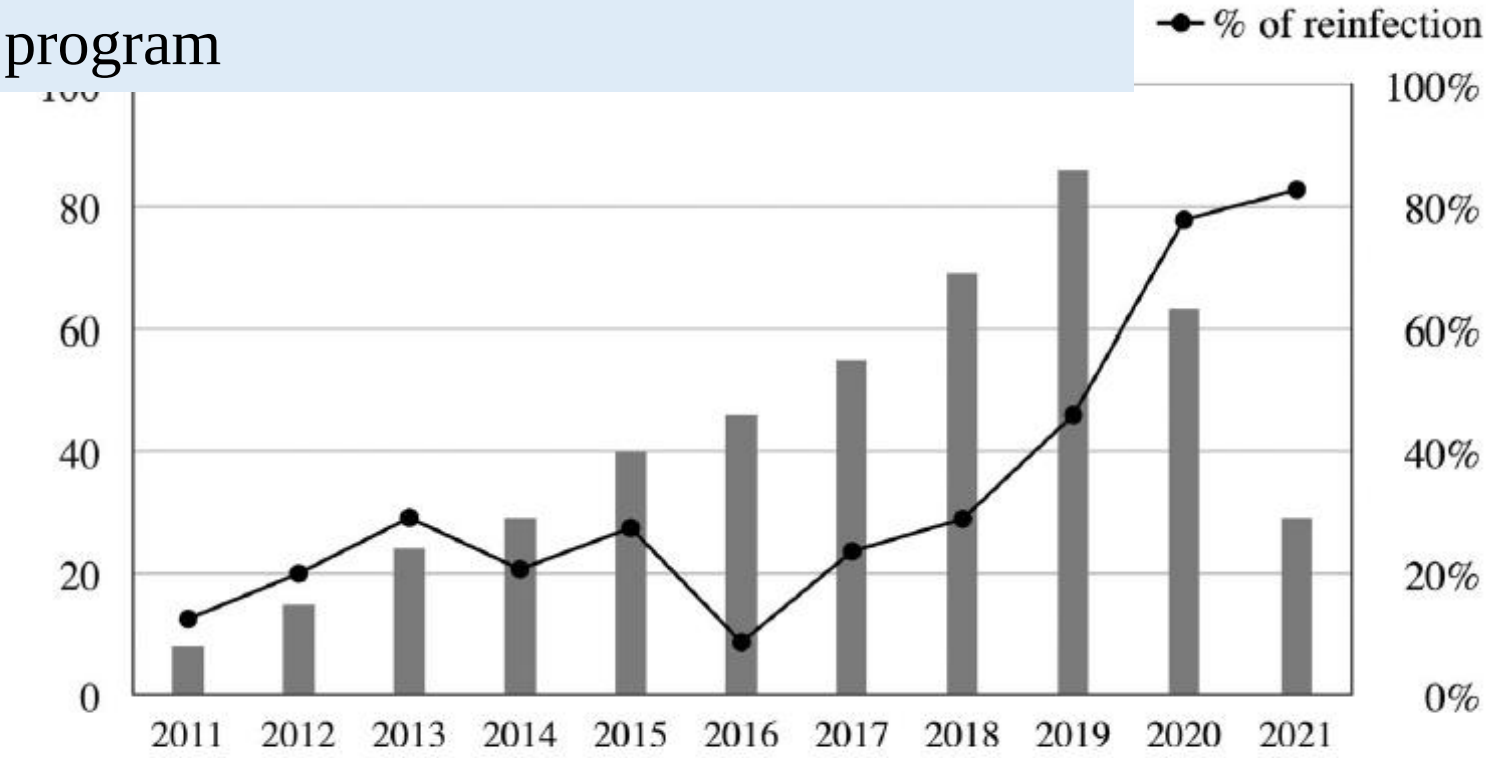
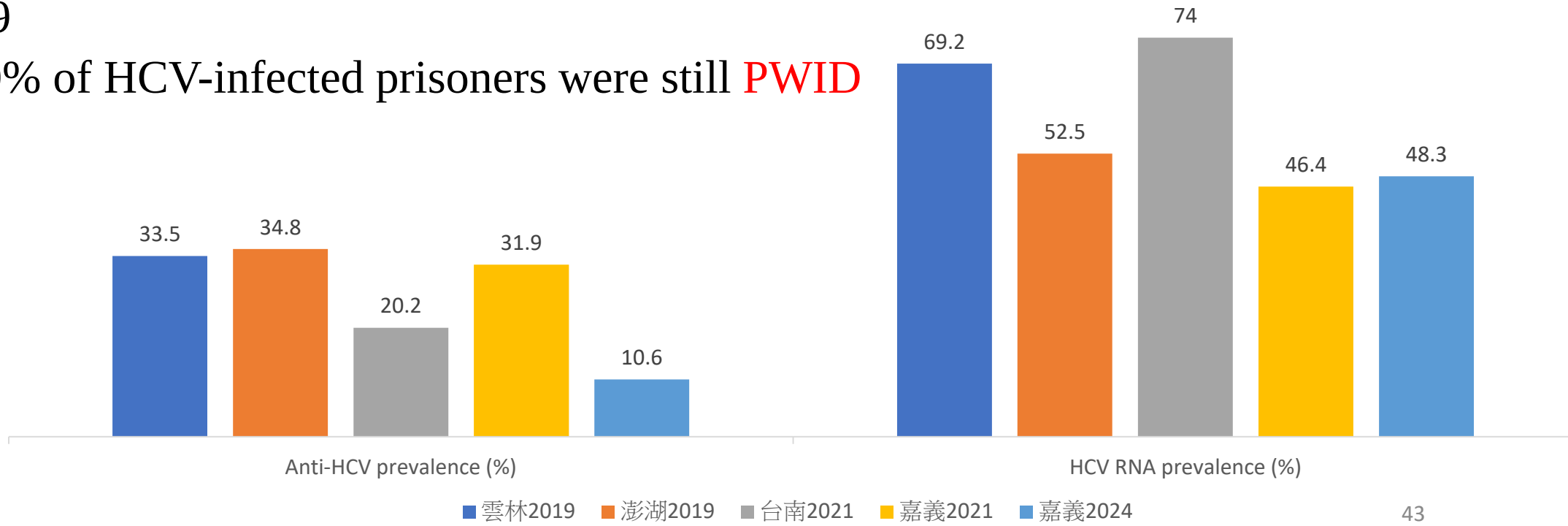


Figure 4. Cases of incident HCV viremia and the proportions of HCV reinfection during 2011–2021.

Chen GJ, et al. Hepatitis C microelimination among people living with HIV in Taiwan. *Emerg Microbes Infect.* 2022;11(1):1664-1671.

HCV Infection and PWID in Prisons

- PWID are the primary risk group for HCV infection and transmission.
- HCV viremia prevalence reduction in PWID Prisoners
  - anti-HCV prevalence in PWID prisoners decreased from 91% in 2014 to 34.8% in 2019
  - > 90% of HCV-infected prisoners were still PWID



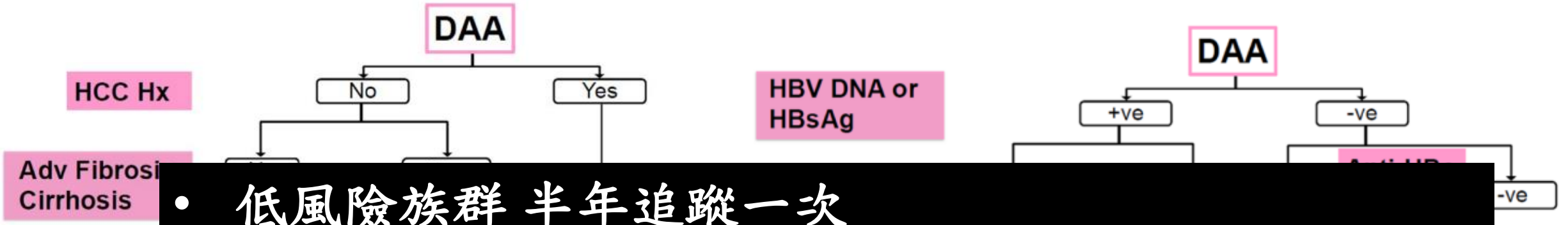
Tai CM, Yu ML. Hepatitis C virus micro-elimination in people who inject drugs: Challenges and chance in Taiwan and worldwide. *Kaohsiung J Med Sci.* 2024;40(2):112-118.

2024年嘉義監獄篩檢
Baseline characteristics

Characteristics Mean ± SD or N (%)	Overall
Age (years), mean (range)	48(44-54)
Age ≥ 65 y, n (%)	4(4.21)
Male, n (%)	95(100)
HCV RNA, log_{10} IU/mL, median (range)	6.301(5.579-6.681)
HCV RNA > 1,000,000 IU/ml, n (%)	57(60.00)
HCV genotype	
1a/1b, n (%)	12/13(26.32)
2, n (%)	10(10.53)
3, n (%)	12(12.63)
4/5, n (%)	0
6, n (%)	47(49.47)
Mixed/ unclassified, n (%)	1(1.05)
Treatment-naïve, n (%)	82(86.32)
Re-infection, n (%)	13(13.68)
Non cirrhosis, n (%)	92(96.84)

AST, IU/L	31(24-47)
ALT, IU/L	43(24-71)
Platelet count, $\times 10^3$ U/L	225(173-275)
Albumin, g/dL	4.5(4.3-4.7)
Total bilirubin, mg/dL	0.55(0.44-0.74)
Creatinine, mg/dL	0.92(0.83-1.01)
FIB-4	1.13(0.83-1.56)
HBV, n (%)	56(58.95)
HBsAg+, n(%)	8(8.42)
HBV DNA > 10IU	3(3.16)
HIV, n (%)	3(3.16)
PWID, n (%)	92(96.84)
Sleep disorder, n (%)	23(24.21)
Schizophrenia, n (%)	2(2.11)

Comorbidities	
Diabetes Mellitus	2(2.11)
Hyperlipidemia	3(3.16)
Hypertension	20(21.05)
Chronic kidney disease	0
Cardiovascular disease	4(4.21)



- 低風險族群 半年追蹤一次
- 高風險族群3個月追蹤一次
- 曾罹C肝懷疑復發 建議直接檢驗C肝病毒量
- 同時有B、C肝病毒慢性感染的病人，肝功能異常時，也需要把B肝發作列入考慮

Fig. 1 Surveillan
tis C virus and s
virals (DAAs). *HCC Hx* history of hepatocellular carcinoma, *Adv Fibrosis* advanced liver fibrosis, *US* ultrasonography, *T* Markers: α-fetoprotein (AFP), lens culinaris agglutinin (LCA)-reactive AFP isoform (AFP-L3) and/or des-γ-carboxy prothrombin (DCP)

fected
d with
ellular
leos(t)
ides, *HBsAg* hepatitis B virus surface antigen, *anti-HBc* ant-hepatitis B virus core antibody, *HBVr* HBV reactivation and/or HBV DNA reappearance, +*ve* positive, -*ve* negative

APASL HCV guidelines of virus-eradicated patients by DAA on how to monitor HCC occurrence and HBV reactivation; Hepatology International (2019) 13:649–661

Conclusion

- HCV簡易治療中，建議使用的泛基因型藥物如下：
  - SOF/VEL（400/100毫克，1顆，每日1次，持續12週）
  - GLE/PIB（100/40毫克，3顆，每日1次，隨餐服用，持續8週）
- 在選擇藥物時，醫師須考量病人服用藥物與DAAs之間的**DDI以及病人順服度**

Conclusion

- 應告知病人 HCV 有可能復發，且高風險族群*的復發機率較高
- 高風險族群*應每年接受 HCV RNA 檢驗
- 有 HCV 病人若經 DAA 治療失敗，應 轉介給肝膽腸胃科醫師

*高風險族群包括男男性行為者及 PWID

建議須持續追蹤的族群–定期超音波檢查

- 肝硬化
- 治療前FIB-4> 3.25 or Plt < 150,000
- AFP治療前後有異常者
- 持續飲酒史
- 肝癌家族史
- 多重共病者

感謝聆聽