Clinical guidance for treating hepatitis C virus infection: a summary

Five key questions before commencing treatment for hepatitis C virus (HCV) infection

- What is the HCV genotype?
- Is cirrhosis present?
- Is HBV–HCV or HIV–HCV coinfection present?
- Are there potential drug–drug interactions?
- What is the renal function (eGFR)?

Checklist for pre-treatment assessment for people with HCV infection

	HCV virology: • Anti-HCV (serology) • HCV RNA level (quantitative) • HCV genotype	 • Indicates HCV exposure • Confirms HCV infection • Determines treatment regimen
	HCV treatment history — previous regimen and response	Determines treatment regimen and duration
	Potential for non-adherence?	Consider medical and social issues that may be barriers to medication adherence
	Alcohol intake history	Cofactor for cirrhosis
	Check for drug–drug interactions	**www.hep-druginteractions.org** Includes prescribed, over-the-counter, herbal, illicit drugs
	Pregnancy discussion*	
	Weight and body mass index	Non-alcoholic fatty liver disease is a cofactor for cirrhosis
	Signs of chronic liver disease	
	FBE	• Baseline haemoglobin level • Low platelets — suspect portal hypertension
	LFTs and INR	Low albumin, raised bilirubin, raised INR suggest advanced cirrhosis
	U&Es and eGFR	• Sofosbuvir is not recommended if eGFR < 30 mL/min/1.73 m^2 • Ribavirin is renally cleared and needs dose reduction if eGFR < 50 mL/min/1.73 m^2
	HBV (HBsAg, anti-HBc, anti-HBs), HIV, HAV serology	Specialist referral is recommended for people with HBV or HIV coinfection If seronegative, vaccinate against HAV, HBV
	Cirrhosis assessment • FibroScan • APRI	Thresholds consistent with no cirrhosis: • Liver stiffness < 12.5 kPa • APRI < 1.0 Specialist referral is recommended for people with cirrhosis
	Electrocardiogram if ribavirin therapy planned and patient is aged > 50 years OR has cardiac risk factors	Screen for ischaemic heart disease

FBE = full blood examination. LFT = liver function test. INR = international normalised ratio. U&E = urea and electrolyte. eGFR = estimated glomerular filtration rate. HBV = hepatitis B virus. HAV = hepatitis A virus. HBsAg = hepatitis B surface antigen. anti-HBc = hepatitis B core antibody. anti-HBs = hepatitis B surface antibody. APRI = aspartate aminotransferase to platelet ratio index. MELD = Model for End-Stage Liver Disease. HCC = hepatocellular carcinoma. * As there are no safety data for the use of any direct-acting antiviral regimen during pregnancy, treatment of pregnant women is not recommended. Ribavirin (Category X) and peginterferon-alfa are contraindicated during pregnancy.

On-treatment and post-treatment monitoring for virological response

Routine monitoring for a 12-week treatment regimen:	
Week 0	• FBE, U&Es, LFTs, HCV RNA level (quantitative)
Week 4*	• LFTs • At each on-treatment visit, assess for: ▸ medication adherence ▸ treatment adverse effects ▸ drug–drug interactions
Week 12 (EOT)	• LFTs†
Week 12 after EOT (SVR)	• LFTs, HCV PCR (qualitative)

EOT = end of treatment. SVR = sustained virological response at least 12 weeks after treatment (cure). FBE = full blood examination. U&E = urea and electrolyte. LFT = liver function test. INR = international normalised ratio. HCV = hepatitis C virus. PCR = polymerase chain reaction.

* People treated with elbasvir plus grazoprevir should have LFTs at Week 8 to screen for hepatotoxicity. The Week 8 LFTs may be done as an alternative to Week 4 LFTs.

† Consider HCV RNA level (qualitative) to document EOT response in people in whom there is concern about non-adherence, particularly if there are risk factors for reinfection.

Patients taking ribavirin may require FBE at Week 2 and Week 4 and then every 4 weeks.

Patients with cirrhosis require HCC screening with liver ultrasound every 6 months.

Ongoing monitoring of people after successful hepatitis C treatment outcome (SVR)

SVR, no cirrhosis and normal LFT results (males, ALT < 30 U/L; females, ALT < 19 U/L):

- People who are cured do not require clinical follow-up for hepatitis C

SVR and abnormal LFT results (males, ALT ≥ 30 U/L; females, ALT ≥ 19 U/L):

- Patients with persistently abnormal LFT results require evaluation for other liver diseases and should be referred for gastroenterology review. Investigations to consider include: fasting glucose level, fasting lipid levels, iron studies, ANA, ASMA, anti-LKM antibodies, total IgG and IgM, AMA, coeliac serology, copper level, caeruloplasmin level and α-1-antitrypsin level

SVR and cirrhosis:

- Patients with cirrhosis require long-term monitoring and should be enrolled in screening programs for:
  - ▸ hepatocellular carcinoma
  - ▸ oesophageal varices
  - ▸ osteoporosis

SVR = sustained virological response at least 12 weeks after treatment (cure). LFT = liver function test. ALT = alanine aminotransferase. ANA = anti-nuclear antibodies. ASMA = anti-smooth muscle antibodies. LKM = liver–kidney microsome. AMA = anti-mitochondrial antibody.

People who do not respond to hepatitis C treatment

- Specialist referral recommended

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GESA Gastroenterological Society of Australia
ala Australian Liver Association
AUSTRALASIAN HEPATOLOGY ASSOCIATION
ASID
ashm Supporting the HIV, Viral Hepatitis and Sexual Health Workforce
hepatitis australia

Treatment protocols for people with hepatitis C virus (HCV) infection and compensated liver disease, including people with HCV–HIV coinfection

Regimen	HCV genotype	No cirrhosis		Cirrhosis	
		Treatment-naive	Interferon-experienced	Treatment-naive	Interferon-experienced
Sofosbuvir 400 mg, orally, daily + Velpatasvir 100 mg, orally, daily	1, 2, 3, 4, 5, 6#	12 weeks	12 weeks	12 weeks*	12 weeks*
Sofosbuvir 400 mg, orally, daily + Ledipasvir 90 mg, orally, daily	1a/b	8 or 12 weeks†	12 weeks	12 weeks	24 weeks
Elbasvir 50 mg, orally, daily + Grazoprevir 100 mg, orally, daily ± Ribavirin 1000/1200 mg, orally, daily‡	1a	12 weeks	12 weeks (relapser) or 16 weeks + ribavirin (OTVF)	12 weeks	12 weeks (relapser) or 16 weeks + ribavirin (OTVF)
	1b	12 weeks	12 weeks	12 weeks	12 weeks
Sofosbuvir 400 mg, orally, daily + Daclatasvir 60 mg, orally, daily§ ± Ribavirin 1000/1200 mg, orally, daily‡	1a/b	12 weeks	12 or 24 weeks¶	12 weeks + ribavirin or 24 weeks	12 weeks + ribavirin or 24 weeks
Paritaprevir–ritonavir (150 mg/100 mg), orally, daily + Ombitasvir 25 mg, orally, daily + Dasabuvir 250 mg, orally, twice daily ± Ribavirin 1000/1200 mg, orally, daily‡	1a	12 weeks + ribavirin	12 weeks + ribavirin	12 weeks + ribavirin	12 weeks + ribavirin**
	1b	12 weeks	12 weeks	12 weeks	12 weeks
Sofosbuvir 400 mg, orally, daily + Daclatasvir, 60 mg, orally, daily§ ± Ribavirin 1000/1200 mg, orally, daily‡	3	12 weeks	12 weeks	12 weeks + ribavirin or 24 weeks	12 weeks + ribavirin or 24 weeks
Elbasvir 50 mg, orally, daily + Grazoprevir 100 mg, orally, daily ± Ribavirin 1000/1200 mg, orally, daily‡	4	12 weeks	12 weeks (relapser) or 16 weeks + ribavirin (OTVF)	12 weeks	12 weeks (relapser) or 16 weeks + ribavirin (OTVF)

SVR = sustained virological response at least 12 weeks after treatment (cure). Relapser = patient who failed to achieve SVR despite achieving an end-of-treatment response. OTVF = on-treatment virological failure (patient who has had a null response, partial response, virological breakthrough or rebound, or intolerance to prior treatment).

Patients with mixed HCV genotype infection or in whom HCV genotype cannot be determined should be treated with sofosbuvir plus velpatasvir for 12 weeks.

* Addition of ribavirin may be considered for patients with genotype 3 HCV and compensated cirrhosis.

† 8 weeks may be considered if HCV RNA < 6×10^6 IU/mL in people with no cirrhosis who are treatment-naive.

‡ Ribavirin dosing is weight-based; recommended dose is 1000 mg for people weighing < 75 kg and 1200 mg for people weighing ≥ 75 kg.

§ Daclatasvir dose modification is required when used in combination with specific antiretroviral therapies for HIV (see full consensus statement).

¶ Recommended treatment duration for sofosbuvir plus daclatasvir (no ribavirin) for people who have failed treatment with a protease inhibitor + peginterferon-alfa + ribavirin is 24 weeks, including people with cirrhosis and people with no cirrhosis; recommended treatment duration for people with no cirrhosis who have previously failed peginterferon-alfa + ribavirin is 12 weeks.

** Recommended treatment duration for paritaprevir–ritonavir, ombitasvir, dasabuvir (PrOD) plus ribavirin in people with genotype 1a HCV and cirrhosis who have had a previous null response to peginterferon-alfa and ribavirin therapy is 24 weeks. PrOD therapy is not recommended for people who did not respond to previous therapy that included an HCV protease inhibitor or an NS5A inhibitor.

Notes: Sofosbuvir is not recommended for patients with an estimated glomerular filtration rate < 30 mL/min/1.73 m². Dose reduction or dose interruption of direct-acting antiviral therapy is not recommended. Dose reduction of ribavirin for the management of symptomatic anaemia according to the product information is appropriate and will not reduce the likelihood of SVR. The recommended treatment regimens differ in the setting of decompensated liver disease (Child–Pugh score ≥ B7) (see full consensus statement).

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