



Centre For Health Economics

## Policy & Research Briefing

October 2016

- The new drugs for hepatitis C have the potential to take a large share of the NHS budget.
- We compared the costs and health benefits of drugs for patients with advanced hepatitis C.
- For most types of hepatitis C, the cost-effective approach was to reserve the new more costly drugs for patients who are not cured after standard interferon-based treatment.
- Using the new drugs as second line achieves similar cure rates at a lower cost as using the new drugs first.
- A price tool is available [here](#) to help choose the cost-effective treatment if drug prices are different from the public list prices.

### Project team:

Rita Faria, Beth Woods, Susan Griffin, Stephen Palmer, Mark Sculpher (CHE), Stephen D Ryder, Nottingham Digestive Diseases Centre, University of Nottingham and Nottingham University Hospitals NHS Trust and Biomedical Research Unit.

### For further information contact:

Centre for Health Economics  
University of York  
[rita.nevesdefaria@york.ac.uk](mailto:rita.nevesdefaria@york.ac.uk)

# Improving Value for Money from Drug Treatment of Hepatitis C

## Background

Around 214,000 people in the UK are chronically infected with hepatitis C (1). Hepatitis C is a major cause of cirrhosis, liver cancer and liver-related death. Until recently, peginterferon was the standard treatment, curing between 45% and 80% of patients at a cost of £5,000-£10,000 per treatment course.

Recently, various new drugs for hepatitis C have become available. These new drugs can cure around 90% of patients and have fewer side effects, but are much more costly at £25,000 to £70,000 per treatment course. Given the large number of patients with this disease, these new drugs have the potential to take a large share of the NHS budget (2).

The National Institute for Health and Care Excellence (NICE) has recommended the new drugs for use by the NHS in England and Wales in some groups of hepatitis C patients (3-8). However, for many patient groups, NICE has recommended multiple options, and the NICE

guidance does not consider the re-treatment of patients. There is, therefore, a lack of guidance about which drugs to use and in which order.

## The research

We compared the costs and health benefits of all drugs for hepatitis C available in June 2015 in sequential therapies of up to three treatment lines in addition to watchful waiting (no treatment) until patients develop cirrhosis. The drugs included are summarised in Box 1.

To do this, we developed an economic model to simulate the costs and health benefits over the patients' lifetime. We focussed on patients with advanced fibrosis, who are at the most risk of progressing to cirrhosis.

We classified patients into subgroups depending on the type of hepatitis C virus, prior treatment, and whether they can have a drug combination that includes interferon.

### Box 1: Drugs included in this study

- Pegylated interferon with ribavirin
- Sofosbuvir with ribavirin with or without pegylated interferon
- Simeprevir with pegylated interferon and ribavirin
- Ledipasvir-sofosbuvir with or without ribavirin
- Ombitasvir-paritaprevir-ritonavir with or without dasabuvir with or without ribavirin
- Daclatasvir with sofosbuvir with or without ribavirin
- Daclatasvir with pegylated interferon and ribavirin

## Conclusions

For most of the subgroups considered, the new drugs should be reserved as second-line for those who are not cured with peginterferon and ribavirin, given their public list prices.

In this sequence approach, patients who are not cured are likely to be cured with the new drugs used for second or third line treatment. This achieves similar cure rates at a lower cost compared with using the new drugs first.

## Price Tool

The NHS is not paying the public list prices for most drugs. Therefore, we have developed a price tool, available to download [here](#), to calculate the cost-effective treatments for a set of user-defined drug prices (see screenshot in Figure 1). The price tool and accompanying publication can help the NHS select drugs to offer for hepatitis C.

Price inputs						
Generic name	Brand name	Packet size	New price	OR	Discount	UK list price
Sofosbuvir	Sovaldi	28	<input type="text"/>		<input type="text"/>	£11,661
Simeprevir	Olysio	7	<input type="text"/>		<input type="text"/>	£1,867
Pegylated interferon	Pegasys 180mcg	1	<input type="text"/>		<input type="text"/>	£124
Ribavirin	Copegus	168	<input type="text"/>		<input type="text"/>	£321
Ledipasvir-Sofosbuvir	Harvoni	28	<input type="text"/>		<input type="text"/>	£12,993
Ombitasvir-paritaprevir-ritonavir	Viekirax	56	<input type="text"/>		<input type="text"/>	£10,733
Dasabuvir	Exciera	56	<input type="text"/>		<input type="text"/>	£933
Daclatasvir	Daclinz	28	<input type="text"/>		<input type="text"/>	£8,173

Insert EITHER the new price OR the % discount in the green box

Cost-effectiveness threshold  Insert the relevant cost-effectiveness threshold; default is £20,000 per QALY gained

Press this button for the model to calculate the cost-effective strategies

### Further project details can be found at:

Faria, R., Woods, B., Griffin, S. Palmer, S., Sculpher, M., Ryder, S.D. Prevention of progression to cirrhosis in hepatitis C with fibrosis: effectiveness and cost-effectiveness of sequential therapy. *Alimentary Pharmacology & Therapeutics* 2016 Oct;44(8):866-76.

Faria, R., Woods, B., Griffin, S. Palmer, S., Ryder, S.D, Sculpher, M. Economic analysis to support NHS implementation of hepatitis C drugs: prioritisation of the treatment options for patients with chronic hepatitis C at the METAVIR F3 stage. *Policy Research Unit in Economic Evaluation of Health and Social Care Interventions*

### References:

1. Public Health England. Hepatitis C in the UK: 2015 report. London: Public Health England, 2015.
2. Woods B, Faria R, Griffin S. Assessing the value of new treatments for Hepatitis C: Are International decision makers getting this right? *Pharmacoeconomics* 2016;34(5):427-33.

3. NICE. Telaprevir for the treatment of genotype 1 chronic hepatitis C. London: NICE, 2012.
4. NICE. Simeprevir in combination with peginterferon alfa and ribavirin for treating genotypes 1 and 4 chronic hepatitis C. London: NICE, 2015.
5. NICE. Sofosbuvir for treating chronic hepatitis C. London: NICE, 2015.
6. NICE. Ledipasvir-sofosbuvir for treating chronic hepatitis C. London: NICE, 2015.
7. NICE. Hepatitis C (chronic)-daclatasvir [ID766]: NICE; 2015. [Available from: <http://www.nice.org.uk/guidance/indevelopment/gid-tag487/documents>].
8. NICE. Hepatitis C (chronic) - ombitasvir/paritaprevir/ritonavir (with or without dasabuvir) [ID731]: NICE; 2015 [Available from: <http://www.nice.org.uk/guidance/indevelopment/gid-tag483>].

### Funding details:

Financial support for this study was provided by the UK Department of Health Policy Research Unit in Economic Evaluation of Health and Care Interventions (EPRU). The views expressed are those of the authors and may not reflect those of the Department of Health or NHS England.



THE UNIVERSITY of York

Centre for Health Economics  
University of York  
Heslington  
York YO10 5DD

UK Tel: +44 1904 321401  
Fax: +44 1904 321402  
Email: [che-news@york.ac.uk](mailto:che-news@york.ac.uk)  
[www.york.ac.uk/che](http://www.york.ac.uk/che)