



*International Coalition of  
Hepatology Education Providers*

# Best of HCV from EASL 2014

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Sciences and Janssen Therapeutics*

## Best of HCV from EASL 2014

- **Candidacy for Treatment of HCV Patients: The Clinical Experience from Kaiser Permanente**
- The New Treatment Regimens for HCV
- Assessment of Patient-related Outcomes During HCV treatment

# Comorbid Conditions Associated With Decision-Making Regarding Treating or Not Treating Chronic Hepatitis C in a Large U.S. Health Maintenance Organization

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# Methods

- Study Design
  - A retrospective study using the database of Kaiser Permanente, Southern California, a large Health Maintenance Organization including 3.5 – 4 million members
- Inclusion Criteria
  - $\geq 18$  years old with a diagnosis code or a positive lab test result for HCV RNA from January 1, 2002 through December 31, 2012
  - $\geq 6$  months continuous membership plus drug benefit prior to HCV treatment
  - Index date was defined as the date of the first treatment course or first chronic HCV diagnosis

## Methods

Identification of comorbid illnesses representing relative or absolute contraindications to HCV treatment with interferon-based therapy were determined by diagnosis codes and/or lab tests for

- Comorbid illness identified in the study: cancer, anemia, autoimmune disorder, renal dysfunction, thrombocytopenia, diabetes, HIV, CVD, psychosis/bipolar disorder, depression, severe lung disease, substance abuse, Hepatitis B, MELD  $\geq$  12

Multivariate logistic regression was used to determine predictors of treatment vs non-treatment

## Entire Population (Patients with a diagnosis code or positive lab test for HCV)

- N=51,984 patients
- 7,945 patients (15%) of this population received treatment

## Study Population (After applying inclusion/exclusion criteria)

- N= 32,283 patients
- 5,533 patients (17%) in the study population received treatment



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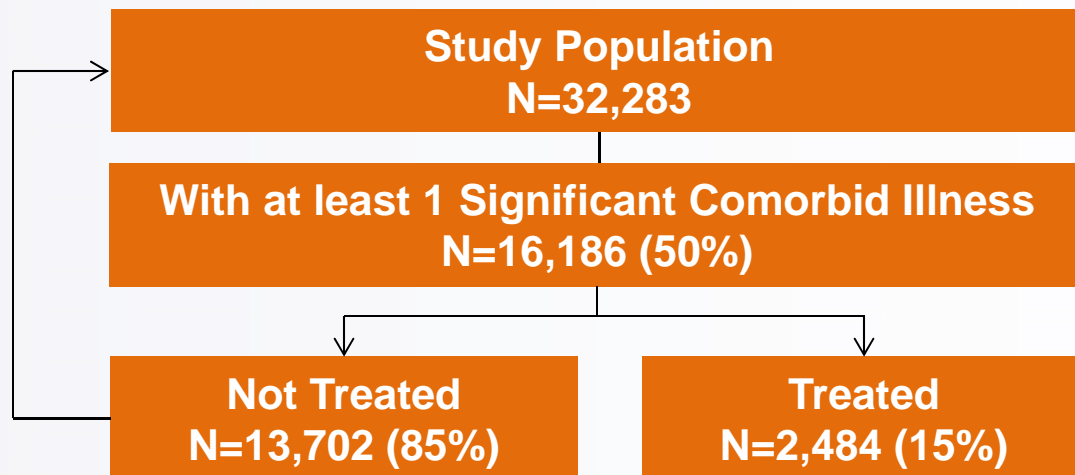
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# Results

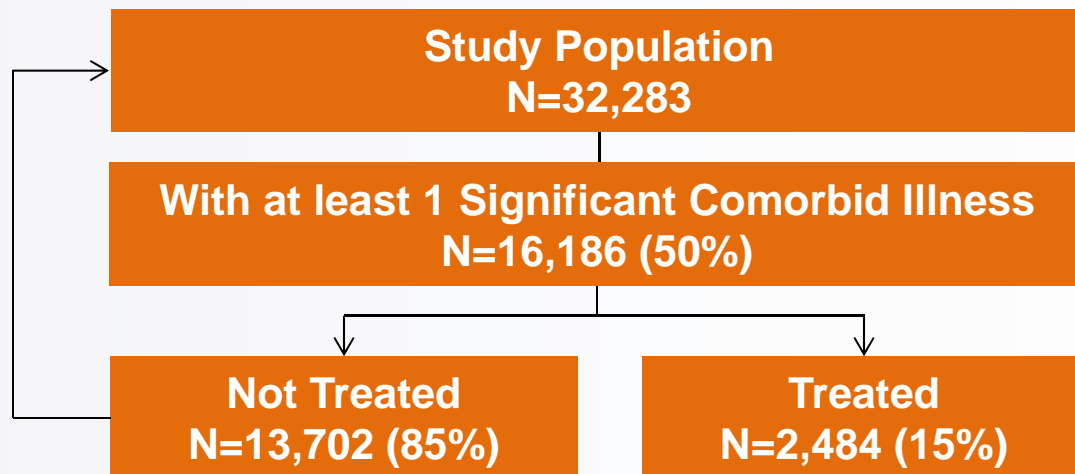
the patients with at least 1 significant comorbid illness





# Results

the patients with at least 1 significant comorbid illness



50% (16,186/32,283) of the study population had a significant comorbid illness

- 15% (2,484/16,186) were treated

- 85% (13,702/16,186) were not treated

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Results

## Factors Associated with Receiving Treatment

In multivariate logistic regression analysis, factors associated with receiving treatment included younger age (age < 65), male gender, presence of cirrhosis, HIV co-infection, and a history of liver transplantation (P = 0.0012 to < 0.0001)

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Results



## Factors Associated with NOT Receiving Treatment

In a multivariate logistic regression analysis, factors associated with not receiving treatment for HCV included presence of anemia, autoimmune disorders, renal dysfunction, CVD, psychosis/bipolar, substance abuse, severe lung disease and MELD > 12 (P = 0.0195 to < 0.0001)

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# Summary



In this large database representing a real world population, only 15-17% of those identified with HCV were treated with interferon-based regimens

2% of the total study population were likely interferon ineligible or intolerant

10% had no apparent contraindications to interferon-based therapy

10% had comorbid conditions representing relative or absolute contraindications to interferon-based therapy

Therefore, interferon-free regimens may offer new treatment options for this group

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st of HCV from EASL 2014



andidacy for Treatment of HCV Patients: The  
linical Experience from Kaiser Permanente

**The New Treatment Regimens for HCV**

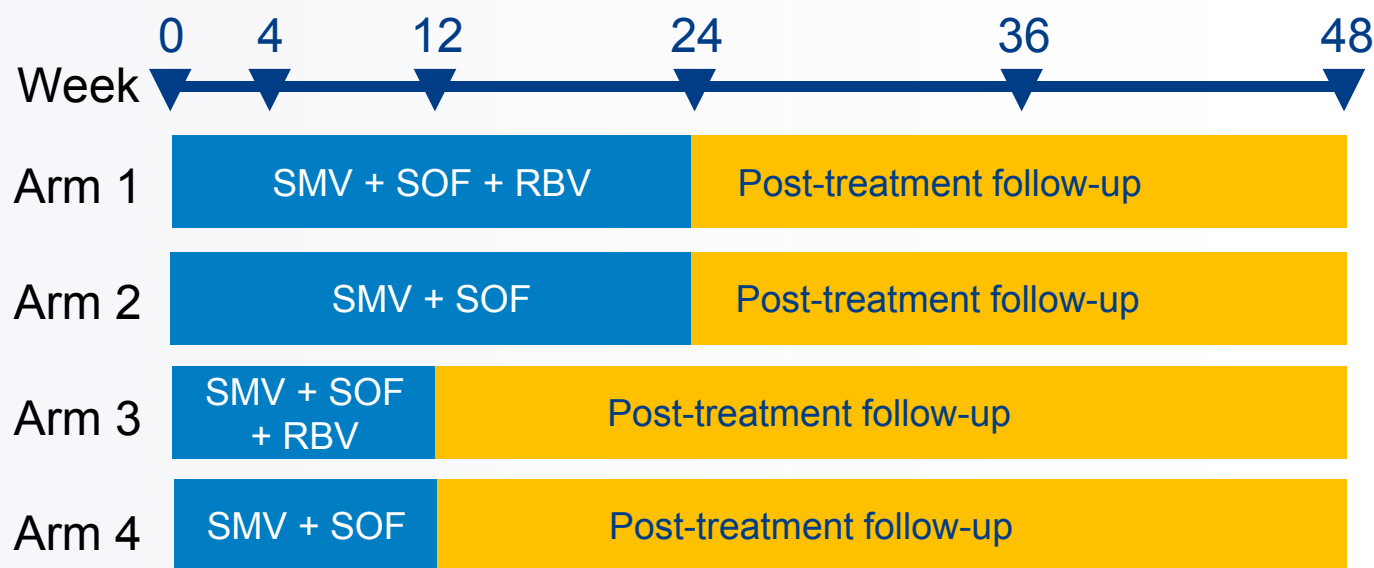
ssessment of Patient-related Outcomes During  
CV treatment

# Simeprevir Plus Sofosbuvir With/Without Ribavirin in HCV Genotype-1 Prior Null-responder / Treatment-naïve Patients (COSMOS Study): Primary Endpoint (SVR12) Results in Patients With METAVIR F3-4 (Cohort 2)

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T. Lambrecht<sup>14</sup>, S. Ouwerkerk-Mahadevan<sup>13</sup>, K. Callewaert<sup>13</sup>, W.T. Symonds<sup>15</sup>, G. Picchio<sup>16</sup>,  
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# DSMOS Study Design: Randomised, Multicentre, Open-label Trial



Randomised  
2:1:2:1

SMV 150 mg QD + SOF 400 mg QD±RBV 1000/1200 mg/day (BID)

Cohort 1: METAVIR F0-F2, prior null responders

Cohort 2: METAVIR F3-F4, prior null responders or treatment-naïve

Stratified by treatment history, HCV GT 1a/1b

Primary endpoint: SVR12

Secondary endpoints: RVR, on-treatment failure, relapse rate, safety and tolerability

twice daily; GT, genotype; QD, once daily; RBV, ribavirin; RVR, rapid virologic response;

sofosbuvir; SOF, sofosbuvir; SVR12, sustained virologic response 12 weeks after end of treatment

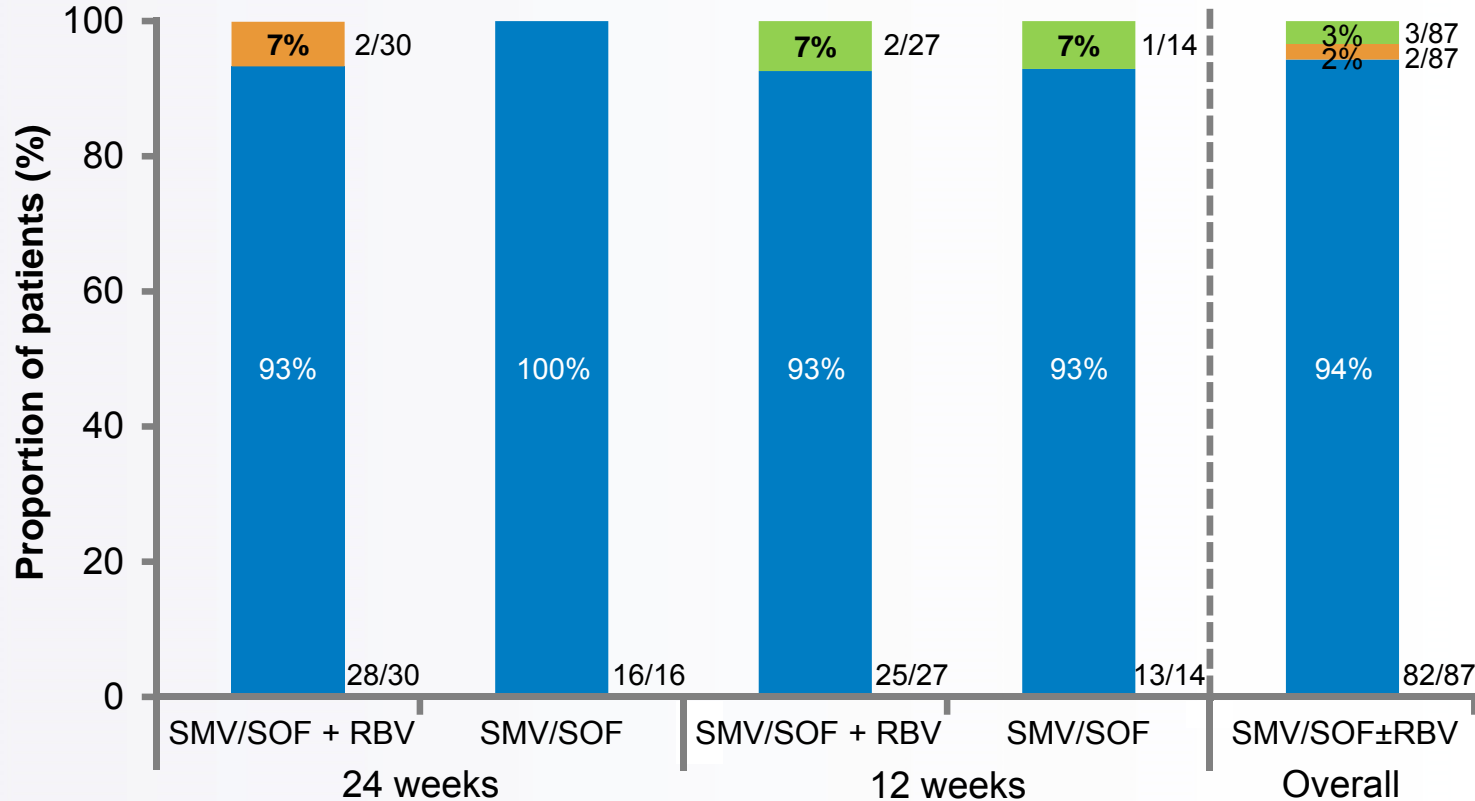


# OSMOS Cohort 2: SVR12 – Primary Endpoint



(population)

■ SVR12 ■ Non-VF ■ Relapse



Non-VF, patients who did not achieve SVR12 for reasons other than virologic failure  
 Intention-to-treat; Non-VF, Non-virologic failure; RBV, ribavirin; SMV, simeprevir; SOF, sofosbuvir; SVR12, sustained virologic response 12 weeks after planned treatment end  
 QD, once daily; RBV, ribavirin; RVR, rapid virologic response; SMV, simeprevir; SOF, sofosbuvir; SVR12, sustained virologic response 12 weeks after end of treatment

## OSMOS Cohort 2: Conclusions

SMV/SOF QD led to SVR12 rates of 93-100% (ITT) in HCV GT 1 infected treatment-naïve and prior full-responder patients with METAVIR F3-4

SVR12 rates were high, regardless of baseline characteristics:

- HCV GT 1 subtype, Q80K polymorphism, METAVIR score, *IL28B* GT, prior treatment history

SMV/SOF QD +/- RBV was safe and well tolerated

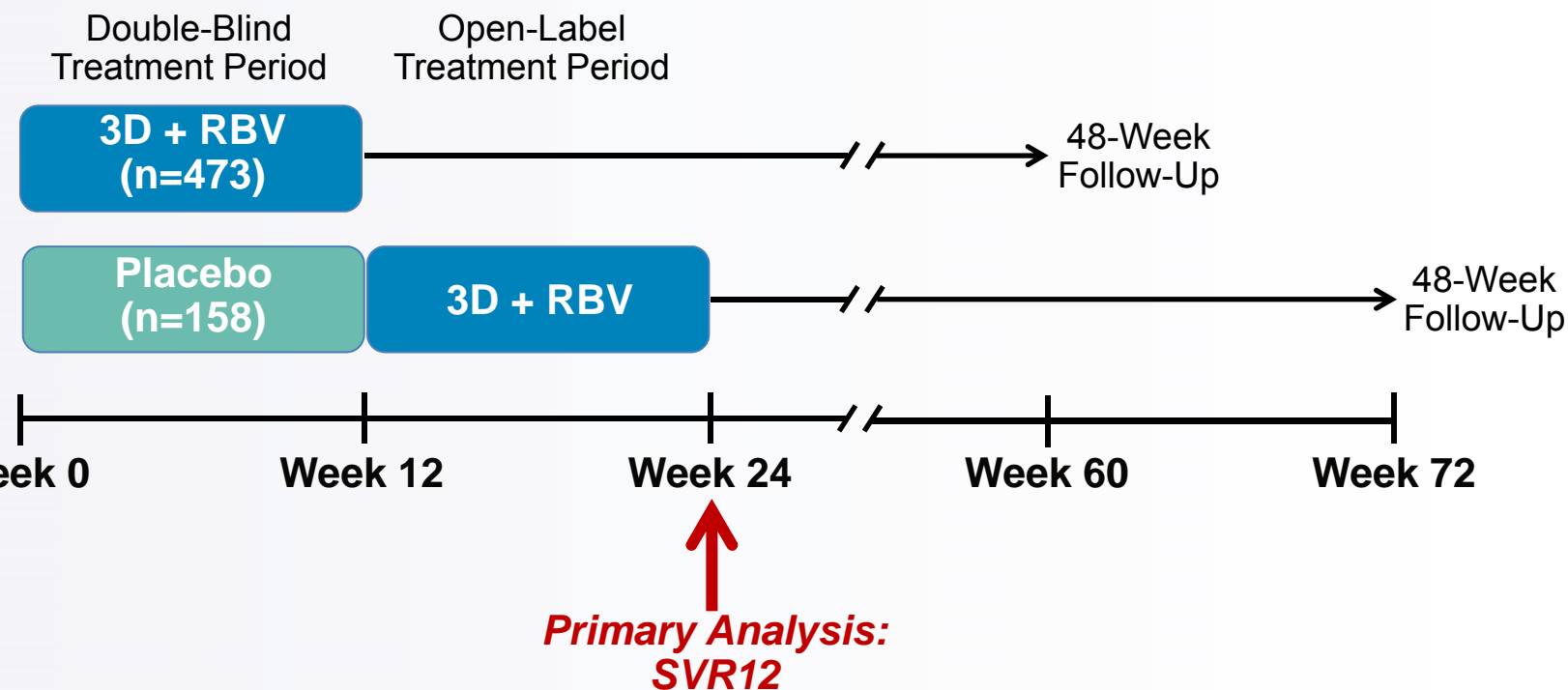
Two Phase 3 trials investigating SMV/SOF without RBV are ongoing (OPTIMIST-1 and -2)

# SAPPHIRE I: Phase 3 Placebo-Controlled Study Of Interferon-Free, 12-Week Regimen Of ABT-450/r/ABT-267, ABT-333, And Ribavirin In 631 Treatment-Naïve Adults With Hepatitis C Virus Genotype 1

**Feld<sup>1</sup>, K.V. Kowdley<sup>2</sup>, E. Coakley<sup>3</sup>, S. Sigal<sup>4</sup>, D. Nelson<sup>5</sup>, D. Crawford<sup>6,7</sup>, O. Weiland<sup>8</sup>, H. Aguilar<sup>9</sup>, J. Xiong<sup>3</sup>, B. DaSilva-Tillmann<sup>3</sup>, L. Larsen<sup>3</sup>, T. Podsadecki<sup>3</sup>**

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# APPHIRE-I: Placebo-Controlled Design (n=631)



3D: co-formulated ABT-450/r/ombitasvir, 150 mg/100 mg/25 mg QD; dasabuvir, 600 mg BID

RBV: 1000-1200 mg daily according to body weight (<75 kg and >75kg, respectively)

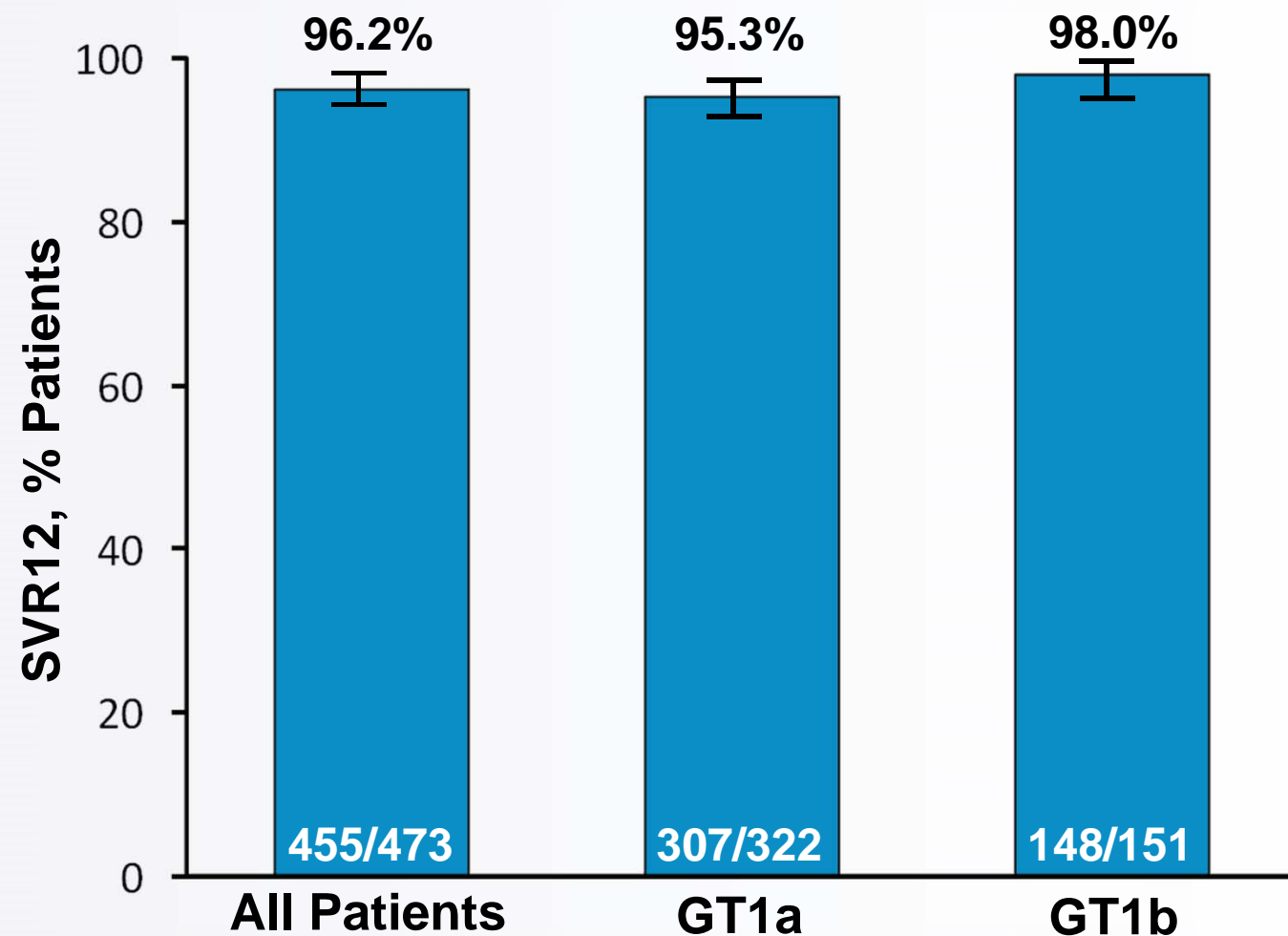
# APPHIRE-I: Baseline Patient Characteristics



	3D ± RBV (N=473)	Placebo (N=158)
Female, n (%)	271 (57.3)	73 (46.2)
Male, n (%)		
White	428 (90.5)	144 (91.1)
Black	26 (5.5)	8 (5.1)
Hispanic/Latino ethnicity, n (%)	27 (5.7)	5 (3.2)
Median age, years (range)	52.0 (18.0-70.0)	52.0 (21.0-70.0)
Median BMI, kg/m <sup>2</sup> (range)	25.2 (18.0-38.4)	25.5 (18.5-39.4)
Fibrosis stage, n (%)		
0-F1	363 (76.7)	116 (73.4)
2	70 (14.8)	27 (17.1)
3	40 (8.5)	15 (9.5)
NS5B non-CC genotype, n (%)	329 (69.6)	108 (68.4)
NS5B subtype, n (%)		
1a	322 (68.1)	105 (66.5)
1b	151 (31.9)	53 (33.5)
Median HCV RNA, log <sub>10</sub> IU/mL (range)	6.51 (3.58-7.60)	6.64 (3.71-7.51)

Genotype and subtype were assessed using the Versant HCV Genotype Inno-LiPA Assay, v2.0.

# APPHIRE-I Results: ITT SVR12 Rates (Superiority to Calculated Placebo Rate)



## APPHIRE-I: Conclusions

The ITT SVR12 rate was 96.2% (455/473) for treatment-naïve GT1-infected patients receiving 12 weeks of co-formulated ABT-450/r/ombitasvir + dasabuvir + RBV

SVR12 rates (ITT) were high regardless of HCV subtype

The rate of virologic failure was low:

- 0.2% breakthrough rate

- 1.5% relapse rate

The regimen was generally well-tolerated, with a low rate of study drug discontinuation due to AE(s) (0.6%)

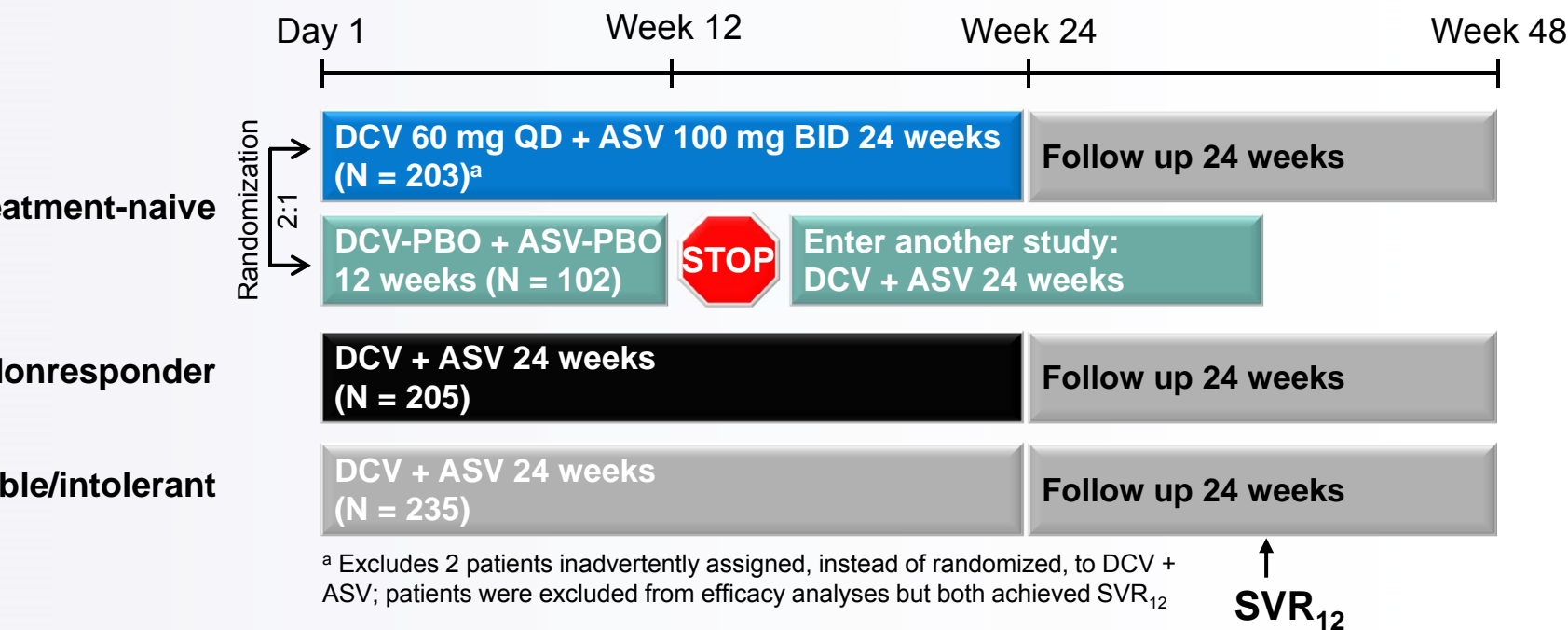


# All-Oral Dual Therapy With Daclatasvir And Asunaprevir In Patients With HCV Genotype 1b Infection: Phase 3 Study Results

**anns<sup>1</sup>, S. Pol<sup>2</sup>, I. Jacobson<sup>3</sup>, P. Marcellin<sup>4</sup>, S. Gordon<sup>5</sup>, C.-Y. Peng<sup>6</sup>, T.-T. Chang<sup>7</sup>, G. Everson<sup>8</sup>, J. G. Gerken<sup>10</sup>, B. Yoffe<sup>11</sup>, W.J. Towner<sup>12</sup>, M. Bourliere<sup>13</sup>, S. Metivier<sup>14</sup>, C.-J. Chu<sup>15</sup>, W. Sievert<sup>16</sup>, J.-P. Bronowicki<sup>17</sup>, D. Thabut<sup>18</sup>, Y.-J. Lee<sup>19</sup>, J.-H. Kao<sup>20</sup>, F. McPhee<sup>21</sup>, J. Kopit<sup>21</sup>, P. Mendez<sup>22</sup>, M. Linaberry<sup>22</sup>, E. Hughes<sup>22</sup>, S. Noviello<sup>22</sup>, HALLMARK DUAL Study Team**

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# Global Phase 3 Study: HALLMARK-DUAL (NCT01447-028)



Primary endpoint: proportion of DCV + ASV-treated patients with SVR<sub>12</sub> in patients infected with HCV genotype 1b

Treatment-naive

Nonresponders: prior null or partial response to pegIFN/RBV

Interferon-ineligible/intolerant (treatment-naive or -experienced) due to

- Depression
- Anemia/neutropenia
- Compensated advanced fibrosis/cirrhosis (F3/F4) with thrombocytopenia

# Patient Baseline Characteristics

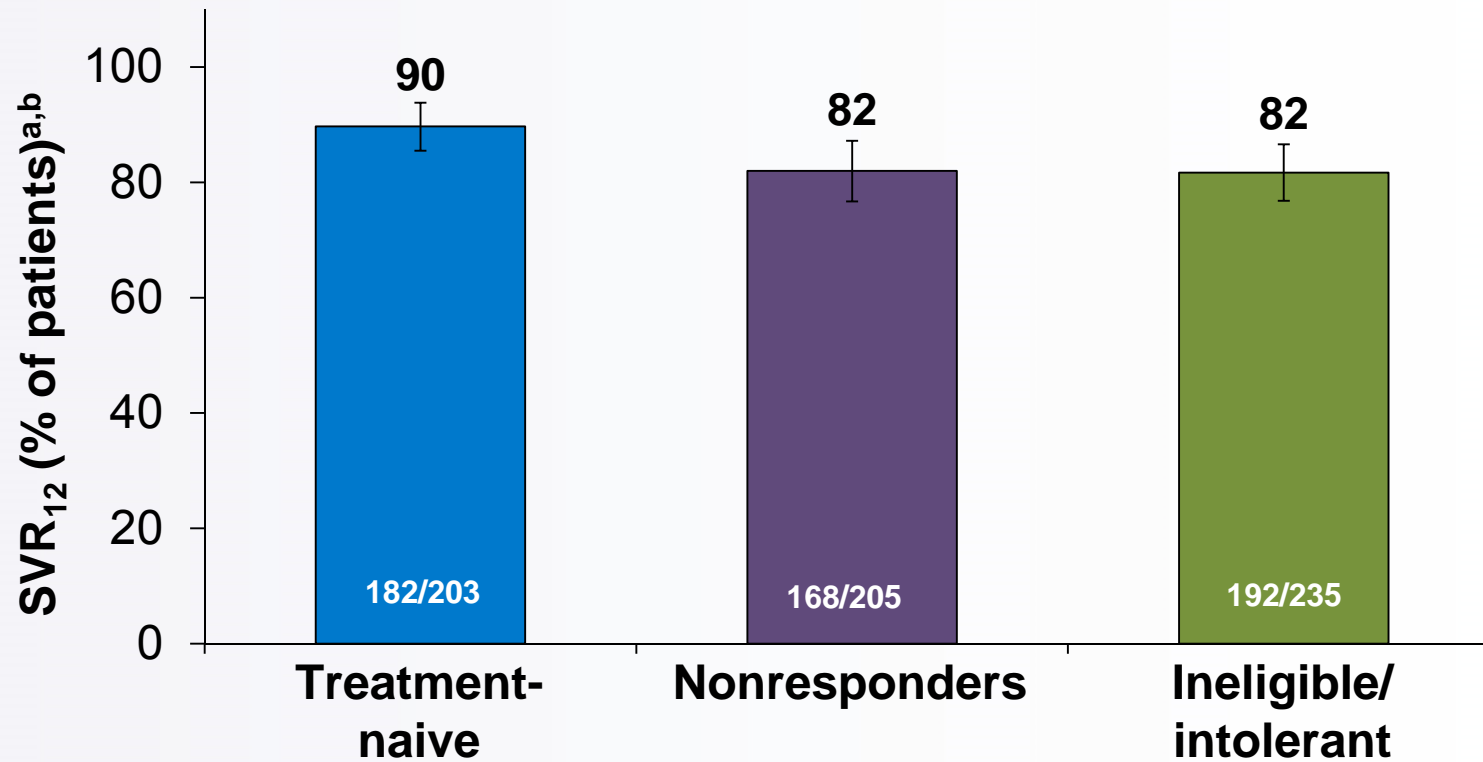


Parameter	Treatment-naive DCV + ASV (N = 205)	Treatment-naive Placebo (N = 102)	Nonresponder <sup>a</sup> (N = 205)	Ineligible/intolerant <sup>b</sup> (N = 235)
Median years	55	54	58	60
(%)	101 (49)	54 (53)	111 (54)	98 (42)
n (%)	135 (66)	59 (58)	148 (72)	169 (72)
	14 (7)	8 (8)	10 (5)	10 (4)
	52 (25)	33 (32)	45 (22)	56 (24)
NA, n (%)				
<1000 log <sub>10</sub> IU/mL	53 (26)	26 (25)	27 (13)	48 (20)
≥1000 log <sub>10</sub> IU/mL	152 (74)	76 (75)	178 (87)	187 (80)
His, n (%)	33 (16)	16 (16)	63 (31)	111 (47)
Genotype, n (%)				
1	76 (37)	N/A	29 (14)	82 (35)
2	129 (63)	N/A	173 (84)	143 (61)

<sup>a</sup> 119 (58%) null responders, 84 (41%) partial responders, and 2 (1%) relapsers.

<sup>b</sup> 71 (30%) patients with depression, 87 (37%) with anemia/neutropenia, and 77 (33%) with compensated advanced cirrhosis with thrombocytopenia (6 with advanced fibrosis [F3], 70 with cirrhosis [F4], and 1 not reported).

# Biologic Response: SVR<sub>12</sub>



- SVR<sub>12</sub> rates documented on or after posttreatment Week 12
  - Treatment-naive: 91%
  - Nonresponders: 82%
  - Ineligible/intolerant: 83%

## Summary

All-oral DCV + ASV therapy achieved SVR<sub>12</sub> rates up to 91% in treatment-naive, 82% in nonresponder, and 83% in ineligible/intolerant patients with genotype 1b

- SVR<sub>12</sub> rates were similar in non-cirrhotic (85%) and cirrhotic (84%) patients

- No differences by age, gender, race, *IL28B* genotype, or prior IFN/RBV treatment experience

DCV + ASV was generally safe and well tolerated

- Only 2% of patients discontinued treatment due to adverse events

DCV is being further evaluated in all-oral combinations in multiple patient populations of high unmet need

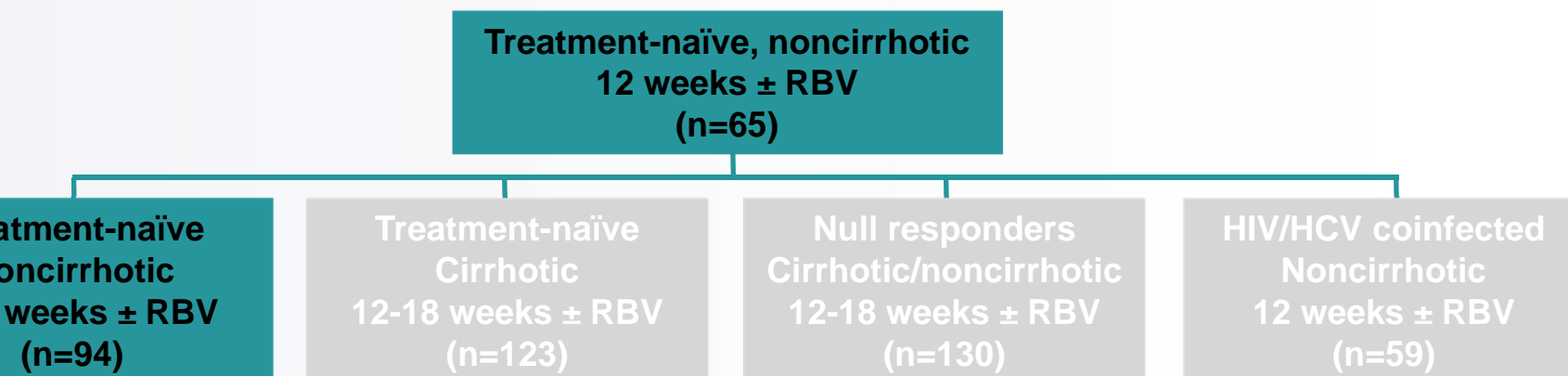
# Safety and Efficacy of the All-oral Regimen of MK-5172/MK-8742 + Ribavirin in Treatment-naïve, Non-cirrhotic Patients With Hepatitis C Virus Genotype 1 Infection: The C-WORTHy Study

**ezode<sup>1</sup>, L. Serfaty<sup>2</sup>, J.M. Vierling<sup>3</sup>, M. Kugelmas<sup>4</sup>, B. Pearlman<sup>5</sup>, W. Sievert<sup>6</sup>, W. Ghesquiere<sup>7</sup>, E. Luckerman<sup>8</sup>, F. Sund<sup>9</sup>, M. Shaughnessy<sup>10</sup>, P. Hwang<sup>10</sup>, J. Wahl<sup>10</sup>, M.N. Robertson<sup>10</sup>, B. Haber<sup>10</sup>**

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# Study: C-WORTHy TN

To assess the efficacy/safety of an 8- to 12-week regimen of MK-5172 + MK-8742 ± weight-based ribavirin in treatment-naïve, noncirrhotic patients with HCV G1 infection

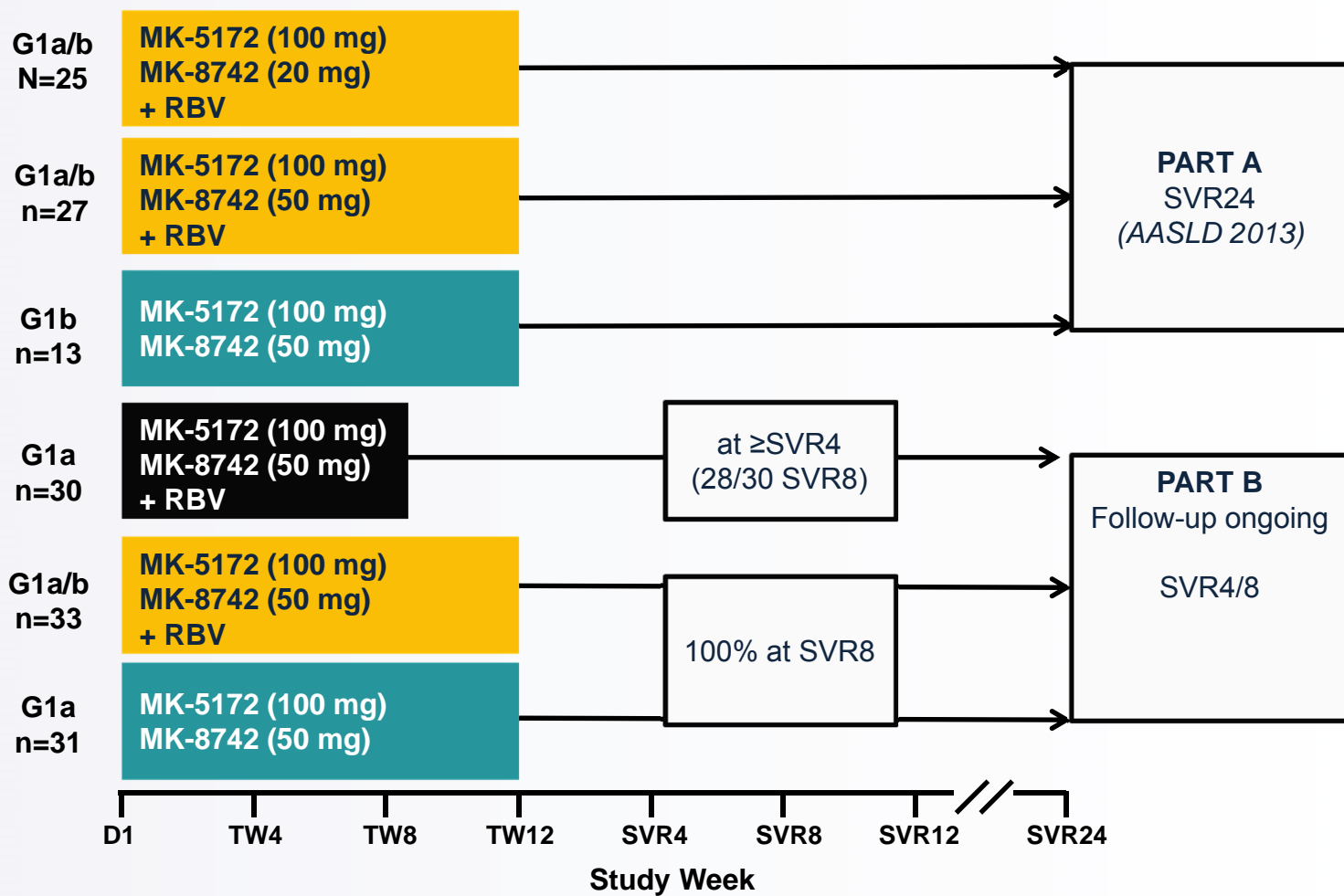


## Key inclusion/exclusion criteria:

- Treatment-naïve patients ≥ 18 years old with chronic HCV G1a or G1b infection
- Liver biopsy or noninvasive test (METAVIR F0-F3)
- Minimum baseline hemoglobin: 12 g/dL (females) or 13 g/dL (males)
- HIV and hepatitis B virus negative
- Alanine aminotransferase (ALT) as aspartate aminotransferase (AST) <350 IU/L

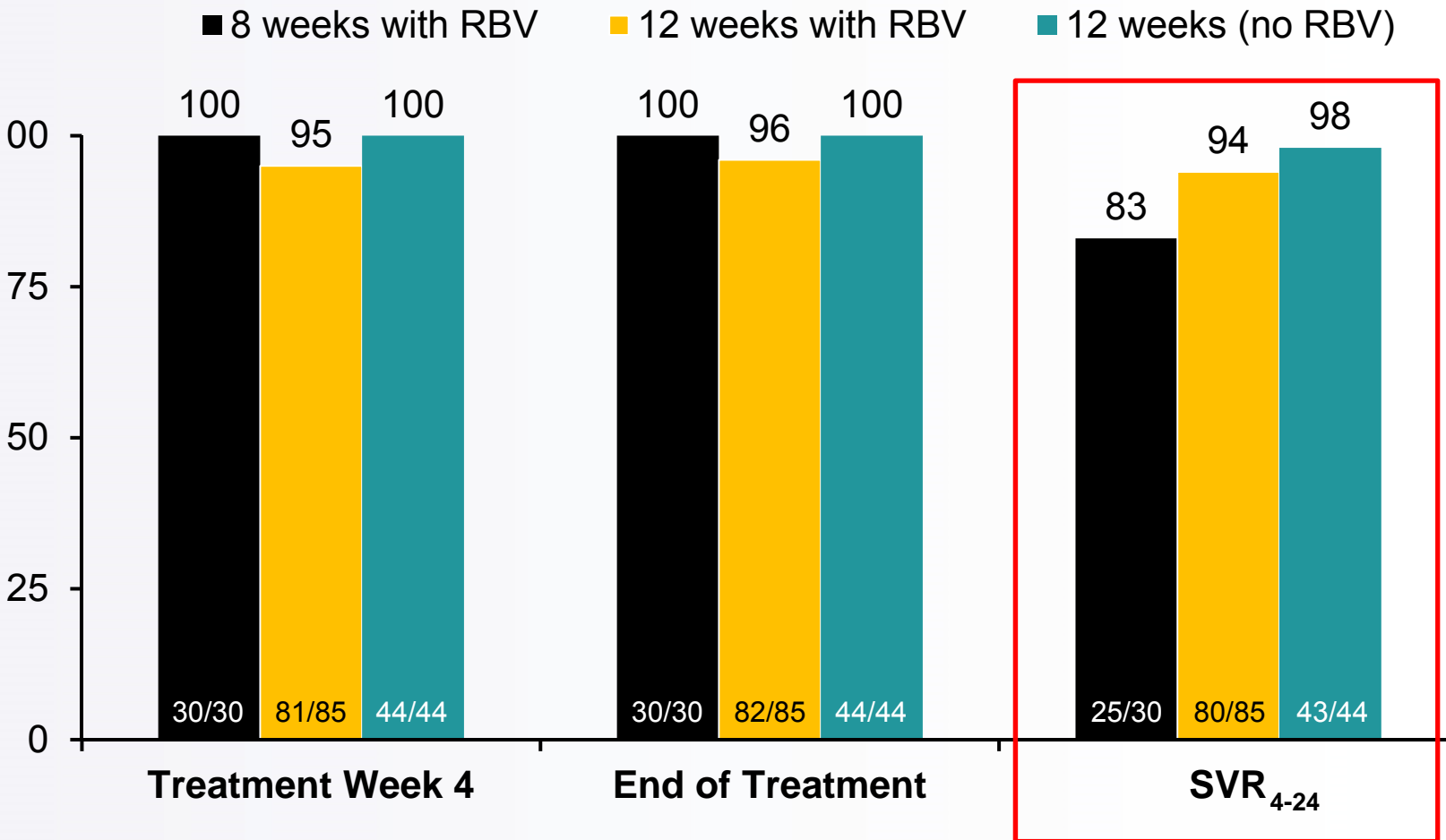


# Study Design



# WORTHy (A+B) – Overall Efficacy (SVR<sub>4-24</sub>)\*

Intention-to-Treat (Nonvirologic Discontinuation = Failure)



\* 100% of patients have completed SVR24; Part B: 8-week arm, 93% of patients have completed SVR8; 12-week arms, 100% of patients have completed SVR8; 2 patients (Part A), 2 patients (Part B) discontinued early (these were counted as failures).

# Summary

## Efficacy

- MK-5172/MK8742 once daily with or without RBV for 12 weeks is highly efficacious with a SVR of 94%-98%
- MK-5172/MK-8742 + RBV for 8 weeks in patients with HCV G1a infection had an SVR<sub>4/8</sub> of 83%
- Most common type of virologic failure was relapse after a treatment duration of 8 weeks

## Safety

- All treatment regimens were generally safe and well-tolerated
- There were no early discontinuations due to drug-related AEs
- No grade 3 or 4 laboratory abnormalities

# Ledipasvir/Sofosbuvir With and Without Ribavirin for 8 Weeks Compared to Ledipasvir/Sofosbuvir for 12 Weeks in Treatment-Naïve Noncirrhotic Genotype-1 HCV-Infected Patients: The Phase 3 ION-3 Study

**J. Kowdley<sup>1</sup>, Stuart C. Gordon<sup>2</sup>, K. Rajender Reddy<sup>3</sup>, Lorenzo Rossaro<sup>4</sup>, David E. Bernstein<sup>5</sup>, Di An<sup>6</sup>, Evguenia S. Svarovskaia<sup>6</sup>, Robert H. Hyland<sup>6</sup>, Phillip S. Pang<sup>6</sup>, William T. Symonds<sup>6</sup>, John G. McHutchison<sup>6</sup>, Andrew J. Muir<sup>7</sup>, Paul J. Pockros<sup>8</sup>, David C. Pound<sup>9</sup>, Michael W. Fried<sup>10</sup>**

<sup>1</sup>Virginia Mason Medical Center, Seattle, WA, USA; <sup>2</sup>Henry Ford Health System, Detroit, MI, USA; <sup>3</sup>Gastroenterology and Hepatology, University of Pennsylvania, Philadelphia, PA, USA; <sup>4</sup>University of California Davis Medical Center, Sacramento, CA, USA; <sup>5</sup>North Shore University Hospital, Manhasset, NY, USA; <sup>6</sup>Gilead Sciences, Inc., Foster City, CA; <sup>7</sup>Division of Gastroenterology and Duke Clinical Research Institute, Duke University School of Medicine, Durham, NC, USA; <sup>8</sup>Scripps Clinic, La Jolla, CA; <sup>9</sup>Indianapolis Gastroenterology Research Foundation, Indianapolis, IN, USA; <sup>10</sup>University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

# Background and Aims

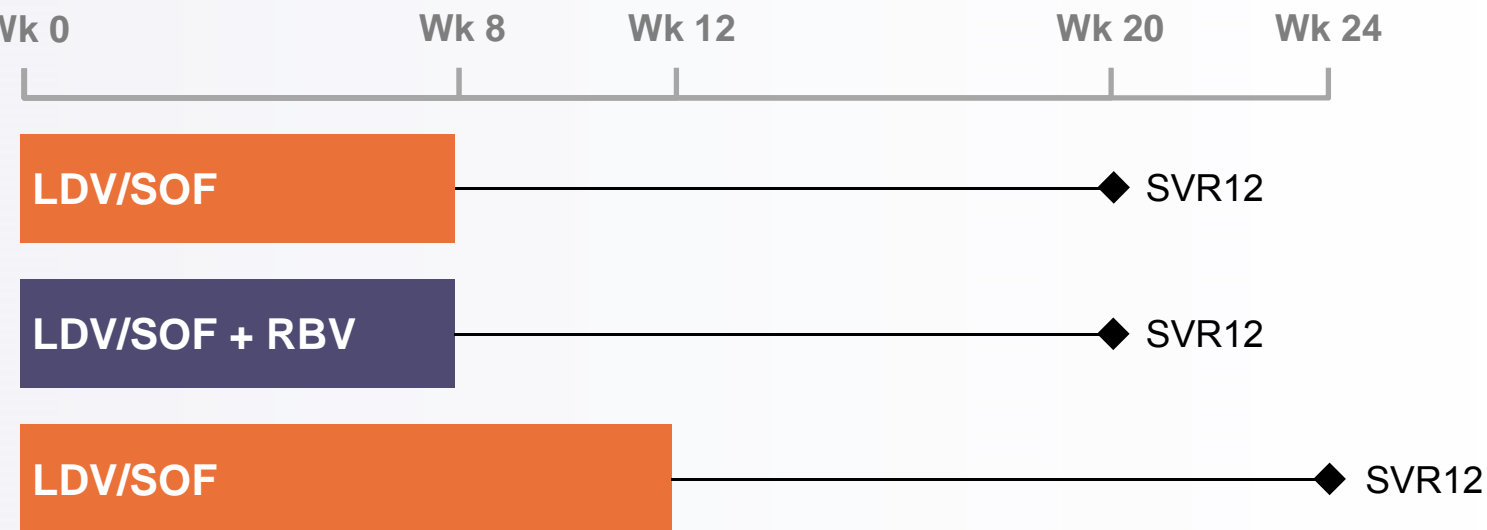
## 1 Treatment-Naïve (ION-3)

LDV/SOF  $\pm$  RBV for 8 weeks and LDV/SOF for 12 weeks demonstrated high SVR rates in the Phase 3 LONESTAR study in treatment-naïve HCV patients without cirrhosis<sup>1</sup>

To evaluate whether LDV/SOF for 8 weeks is as effective for HCV treatment-naïve, non-cirrhotic, GT1b patients or if RBV or a longer treatment duration of 12 weeks is required to achieve high SVR rate

# Study Design

## 1 Treatment-Naïve (ION-3)



T 1 treatment-naïve patients without cirrhosis

broad inclusion criteria

- No upper age or BMI limit

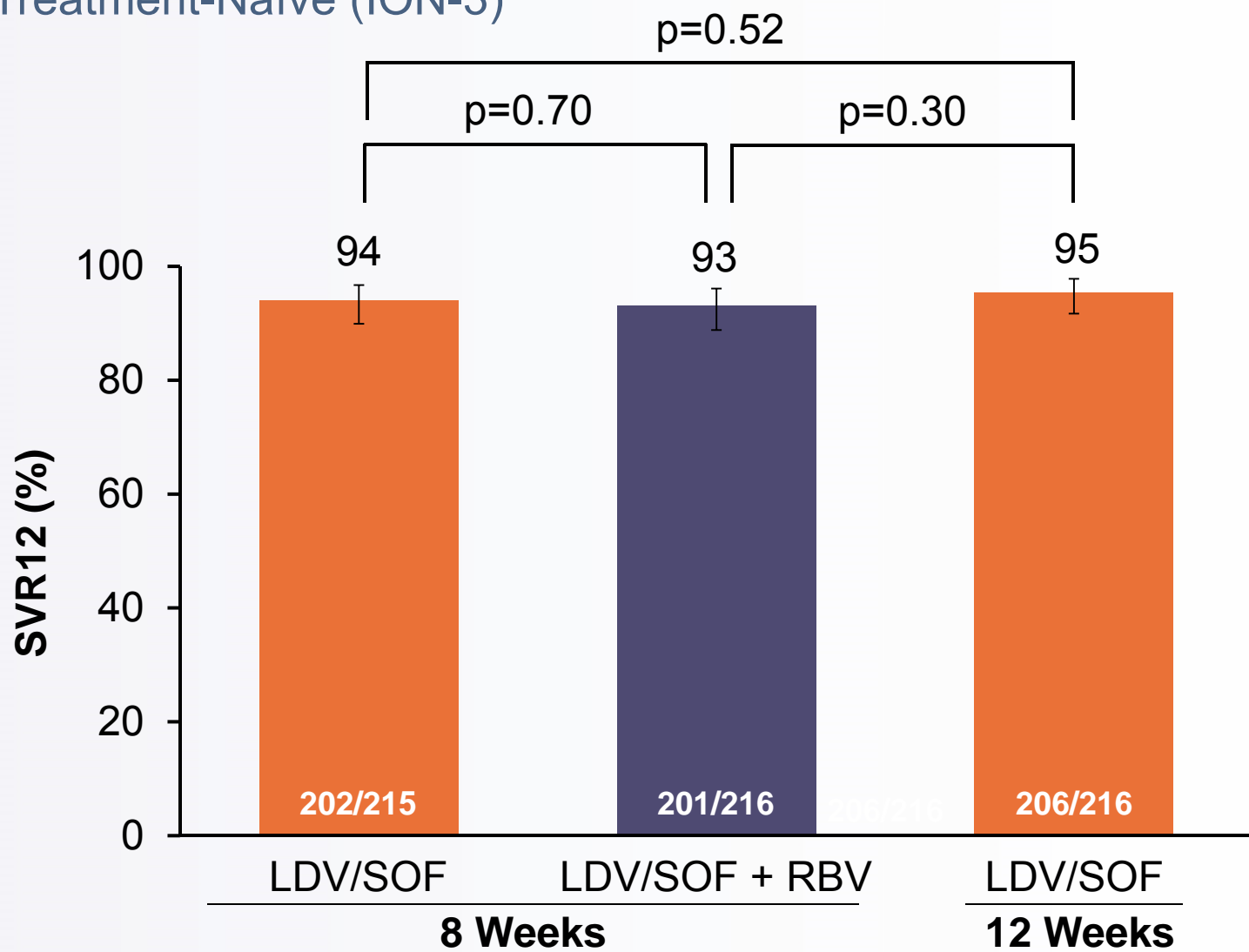
- Opiate substitution therapy allowed

47 patients randomized 1:1:1 across three arms

stratified by HCV subtype (1a or 1b)

# Results: Non-Inferiority Comparison

1 Treatment-Naïve (ION-3)



bars represent 95% confidence intervals.



# Conclusions

1 Treatment-Naïve (ION-3)

LDV/SOF ± RBV for 8 or 12 weeks results in high SVR12 rates

No difference in efficacy among the groups was observed

Host and viral factors traditionally associated with lower SVR rates did not affect SVR12 rates

LDV/SOF ± RBV was safe and well tolerated

- RBV contributed to a higher incidence of AEs and laboratory abnormalities

An 8 week LDV/SOF treatment regimen is a safe and effective treatment for treatment-naïve non-cirrhotic patients with HCV GT 1 infection

# Levitasvir (LDV) and Sofosbuvir (SOF) Combination Improves Patient-Reported Outcomes (PRO) During Treatment of Chronic Hepatitis C (CH-C) Patients: Results From the ION-1 Clinical Trial

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er for Liver Diseases, Department of Medicine, Inova Fairfax Hospital, Falls Church, VA, United States, Hepatitis Research Unit, Hopital Beaujon, Clichy, France, <sup>3</sup>Hepatology, Beth Israel Deaconess Medical Center, Boston, MA, <sup>4</sup>Betty and Guy Beatty Center for Integrated Research, Inova Health System, Falls Church, VA, United States

## Background

Interferon-based treatment for chronic hepatitis C (CH-C) causes substantial side effects that negatively impact patient-reported outcomes (PROs).

The use of ribavirin (RBV) is associated with additional burden on PROs

Emerging interferon- and ribavirin-free regimens are expected to result in less if any adverse events and, therefore, better PROs in patients undergoing anti-CV treatment

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to assess patient reported outcome of CH-C  
patients treated with sofosbuvir and ledipasvir  
(LDV+SOF) with or without ribavirin in the 12  
weeks arms of ION-1 clinical trial

# N-1 Multicenter Phase 3 Clinical Trial

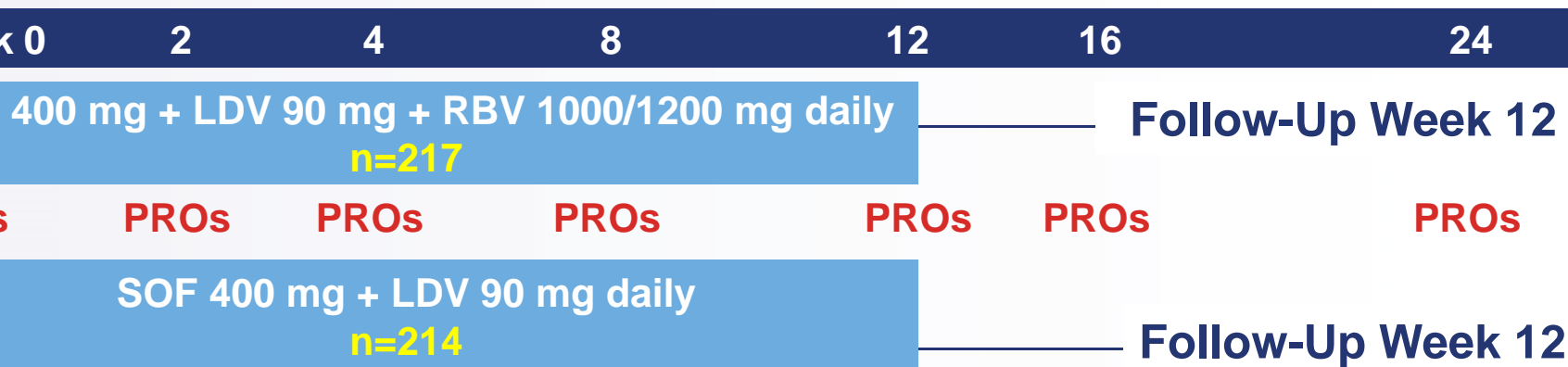


31 HCV genotype 1 treatment-naïve patients in 12 weeks arm of the study

**Clinical data:** 52±11 years old, 59% male, 16% cirrhotic, 56% from USA

**Patient-reported outcome (PRO)** questionnaires were completed at

baseline, during and post-treatment: **SF-36, FACIT-F, CLDQ-HCV, WPAI:SHP**

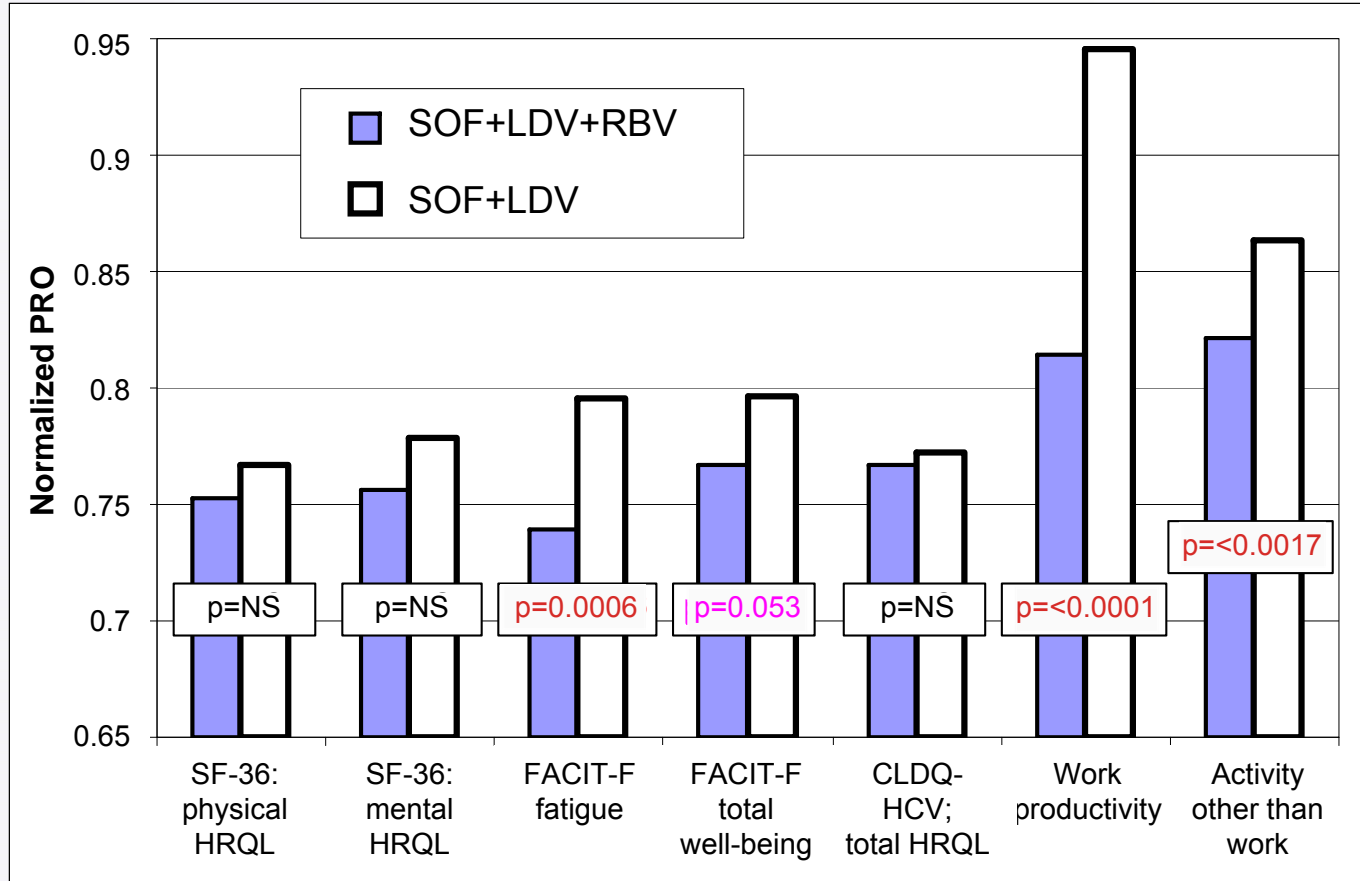


**Treatment-related anemia:** 74.2% in LDV+SOF+RBV, 7.0% in LDV+SOF (<0.01)

**SVR rate:** 97.2% in LDV+SOF+RBV, 98.6% in LDV+SOF (p=NS)

*-treatment and post-treatment HCV RNA viral load results were blinded to patients and investigators*

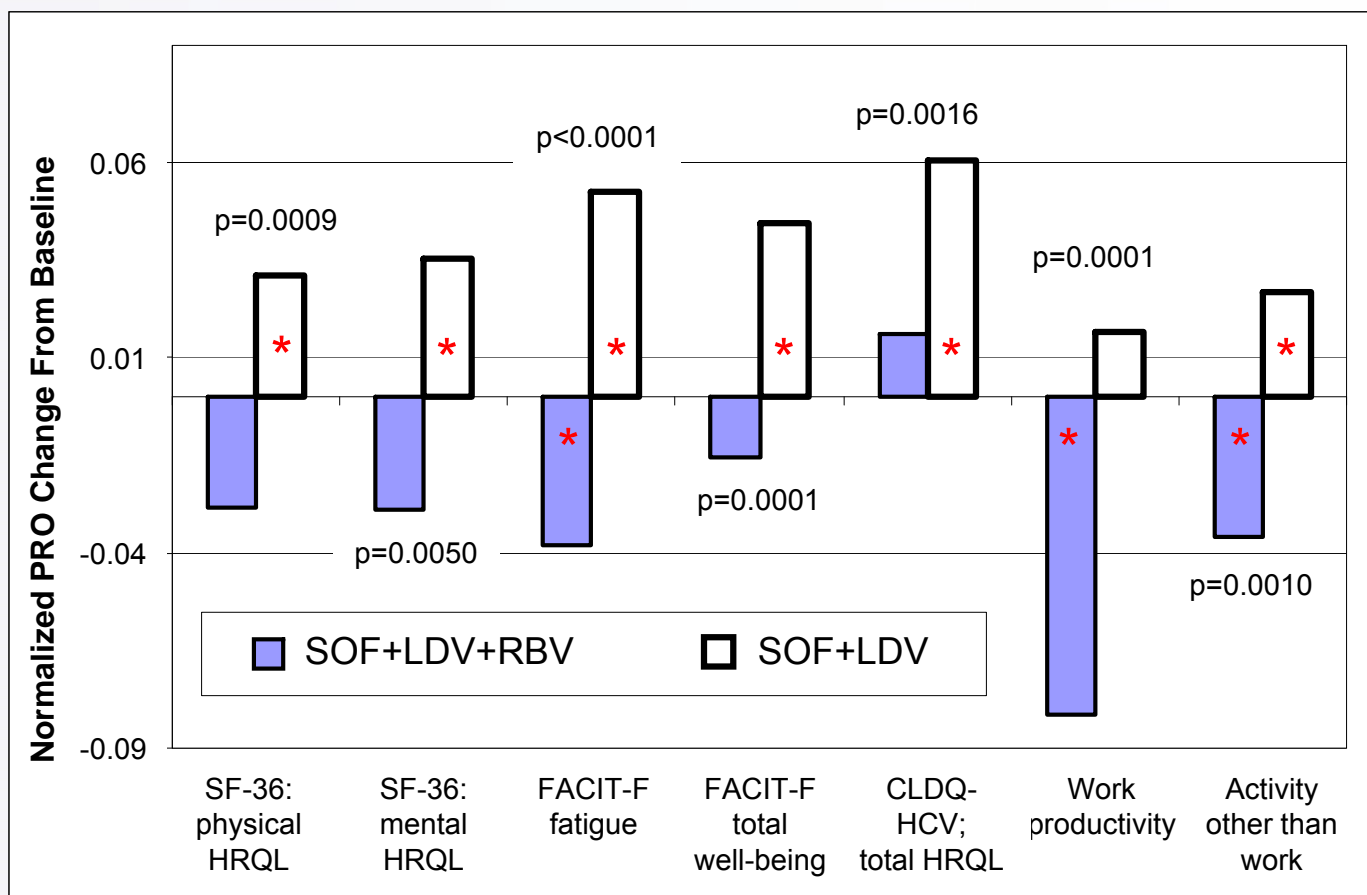
# PRO Scores in Patients Treated With Ledipasvir and Sofosbuvir With or Without Ribavirin: Treatment Week 12



Values represent differences between treatment regimens

not significant (p>0.05)

# Changes in PRO Scores From Baseline to Treatment Week 12



Values represent differences between treatment regimens

0.05 for the difference from baseline

## Conclusions

Treatment-naïve genotype 1 CH-C patients receiving sofosbuvir+ledipasvir have similar SVR and superior PROs compared to patients receiving the same regimen with added ribavirin

The RBV-free regimen is associated with improved PRO scores during treatment and after achieving SVR-12



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## Best of HCV from EASL 2014



During this year's EASL meeting (ILC-2014, London, England), exciting data regarding a number of new regimens to treat HCV were presented

The data presented showed that these regimens have high efficacy, improved safety, and shorter duration of treatment

Furthermore, some of these regimens can clearly improve patient reported outcomes such as fatigue and HRQL