



National rapid response for HIV management  
and bloodborne pathogen exposures.

# Out with the Old and In with the New....A Shift in the Hepatitis C Treatment Paradigm:

Betty J. Dong, PharmD, FCCP, FAPHA, FASHP, AAHIVP  
Professor of Clinical Pharmacy, UCSF School of Pharmacy  
HIV/HCV Pharmacy Consultant, Clinician Consultation Center  
Pharmacist Clinician, UCSF Liver Transplant Ambulatory Care Clinics,  
San Francisco, CA

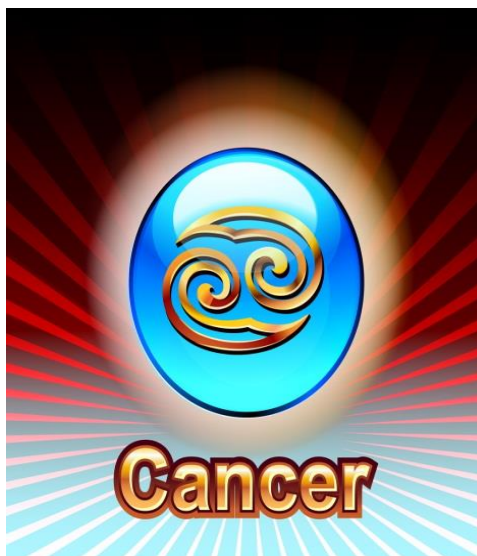


# Goals of hepatitis C treatment

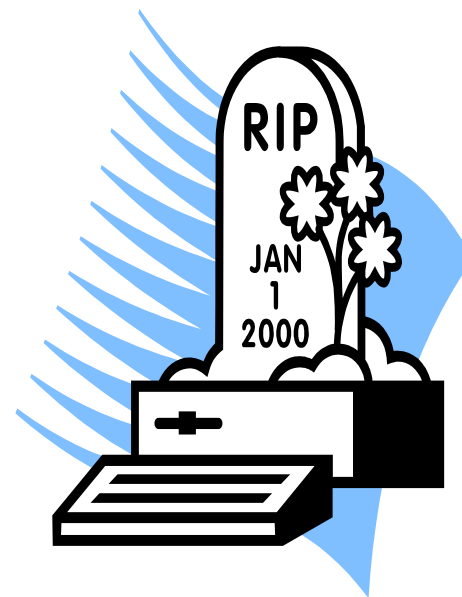
- To reduce all-cause mortality and liver related adverse events (ESLD, HCC) by achieving an “virologic cure” as evidenced by an SVR<sub>12</sub>
- SVR<sub>12</sub> (sustained virologic response ): an undetectable HCV viral load (<25 IU/ml) at least 12 weeks after completion of therapy.



**Complications of ESLD**  
**2<sup>nd</sup> to cirrhosis**



**HCC**



**Death**



## Case

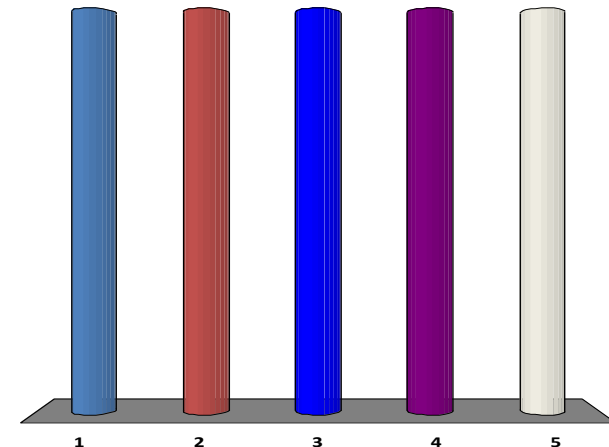
- STP is a 58 y.o. male with GT 1a infection, TN, and cirrhosis.
- Denies varices bleed, ascites, encephalopathy
- PMH: GERD, hypertension, DM2, renal insufficiency
- Labs: HCV VL 128,000 IU/ml
- AST 168, ALT 131 INR 1.5 T. bili 1.5, PLTs 62K, alb 3.4 gm/dl, Scr 1.5, BUN 25, A1c 7% CrCL 50 cc/min
- Allergies: NKA
- Meds: Omeprazole 40 mg daily, amlodipine 10 mg daily, lisinopril 40 mg daily, atorvastatin 80 mg daily, ASA 81 mg daily, glipizide 10 mg daily

# Self-Assessment Question

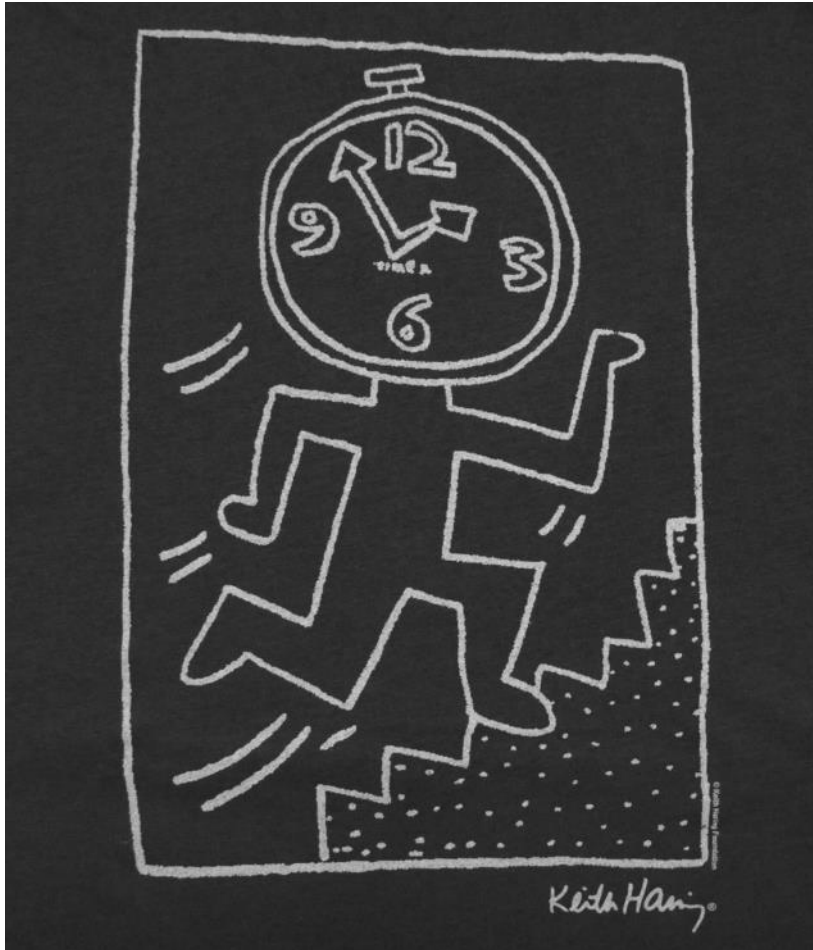
Which of the following HCV GT 1a direct acting agents for STP would be most effective and result in the lowest risk of overall drug interactions?

1. Sofosbuvir/ledipasvir (Harvoni)
2. Paritaprevir/ritonavir/ombitasvir/dasabuvir (ViekiraPak or PROD) + RBV
3. Sofosbuvir (Sovaldi)/simeprevir (Olysio)
4. Sofosbuvir (Sovaldi)/daclatasvir(Daklinza)
5. Grazoprevir/elbasvir (Zepatier)

atorvastatin, ASA, omeprazole, amlodpine, lisinopril, glipizide



# Treat Now or Wait?



- Treatment recommended for all patients with chronic HCV infection, except those with short life expectancies that cannot be remediated by treating HCV, by transplantation, or by other directed therapy.

# Key Considerations:

## Deciding to Treat or Wait

- Patient factors
  - Urgency to treat
  - Likelihood of response
    - HCV GT (1b >1a, GT 3)
    - Treatment experience (TN > TE)
    - Degree of fibrosis
      - Compensated cirrhosis vs. decompensated
    - Resistance: 5A RAVs
    - Renal: ESRD, HD
    - HIV, HBV, DM, male, AA, older
  - Patient motivation
  - Patient adherence
- Treatment factors
  - Efficacy of Treatment options:
    - TN SVR > 95%+
  - Safety of options
    - Well tolerated
    - Drug interactions
  - Duration of therapy
    - 12 weeks (8 to 24)
  - Pill burden, dosing frequency
  - Future options and their timelines

# All-oral HCV Treatment is Cost-Effective

Study	Key Finding
<u>Leidner, Hepatology</u> 2015	For 55 yo treated with \$100,000 regimen and SVR 90%, treating F2 compared to waiting until F3 had CE= <b>\$37,300/QALY</b> . Threshold cost for treating at F0 versus waiting until F1 to yield \$50,000/QALY = \$22,200
Rein, CID 2015	LDV/SOF and 3D compared to no treatment yields <b>\$32,000 - \$35,000/QALY</b> . Compared to no treatment, the threshold cost for treating F0 with an all-oral regimen = <b>\$47,000/QALY</b>
<u>Najafzadeh, Ann Int Med</u> 2015	Compared to no treatment in Geno-1, costs per additional QALY gained for LDV/SOF = <b>\$25,291</b> and PEG/RBV = \$24,833 If LDV/SOF <b>&lt;\$66,000</b> /treatment course, would be <b>cost saving</b>
<u>Chhatwal, Ann Int Med</u> 2015	Average ICER for SOF-based treatment compared to prior SOC = <b>\$55,378/QALY</b> . Range = \$9,703/QALY for naïve, cirrhotic G-1 to \$410,548/QALY for treatment-experienced G-3 without cirrhosis

Adapted from: Pricing of Drugs and Formulary Placement: Making Sense of Hepatitis C Treatment  
Camilla S. Graham, MD, MPH. [www.NATAP.org](http://www.NATAP.org)

**But not cheap...**



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# Preparing for Treatment/ My Readiness List

- ☑ Patient wants Hepatitis C treatment
- ☑ Patient generally keeps scheduled medical appointments
- ☑ Patient available by phone or another reliable way
- ☑ If substance abuse and/or mental health issues, stabilized or engaged in treatment to the degree that patient can complete 12 (range 8 to 24) weeks of Hepatitis C therapy
- ☑ Active medical issues (HIV, Diabetes, etc.) stable with adherence to other prescribed medications
- ☑ Patient able to identify adherence for achieving “HCV cure”
- ☑ Evaluation for potential drug-drug interactions. Pt able to avoid herbals, supplements, H2, PPI, during therapy
- ☑ Patient can articulate a plan to avoid HCV reinfection after therapy

# HCV Agents

## NS3A/4A Protease Inhibitors

## Polymerase Inhibitors

Nucleotide

Nonnucleoside

## NS5A Inhibitors

## Other

Simeprevir

Sofosbuvir

Dasabuvir

Ledipasvir

Ribavirin  
PEGIFN

Paritaprevir/  
ritonavir

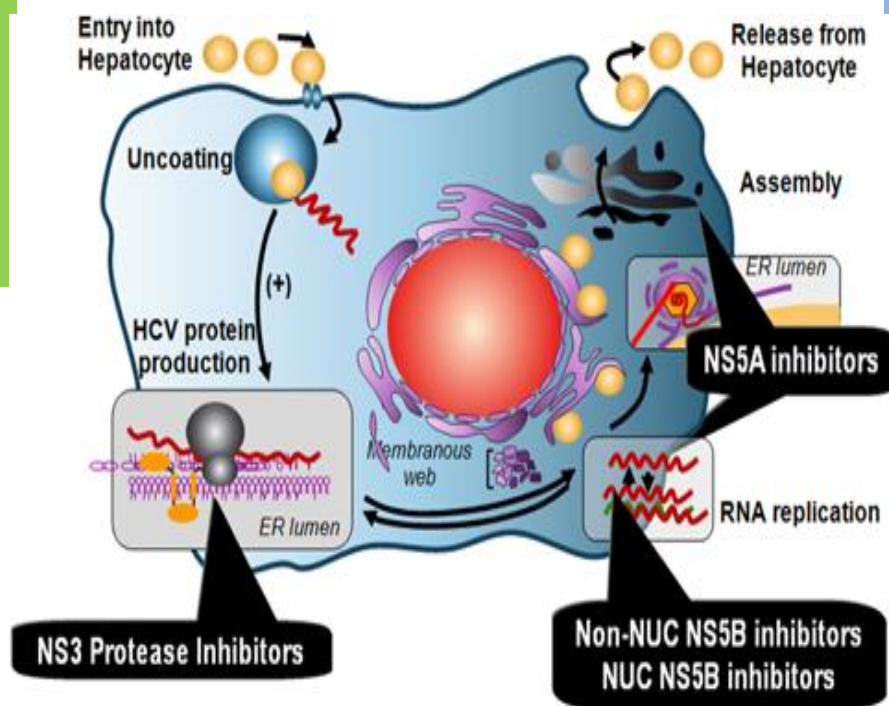
Grazoprevir

Daclatasvir  
(DCV)

Ombitasvir

Elbasvir  
(EBR)

Velpatasvir  
(GS-5816)



# HCV standard of care:

## <http://www.hcvguidelines.org/>

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## Recommendations for Testing, Managing, and Treating Hepatitis C



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Infectious Diseases Society of America

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What's New and  
Updates/Changes

Tuesday, September 2, 2014

Simeprevir concentration is increased by approximately 6-fold when coadministered with cyclosporine (in combination with daclatasvir and RBV)....

[Read more >>](#)

Monday, August 11, 2014

We are pleased to introduce the newest section of the Guidance, **When and in Whom...**

[Read more >>](#)



*This website is constantly being updated. Please remember to always refresh your page.*

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### Background of the Hepatitis C Guidance

New direct-acting oral agents capable of curing hepatitis C virus (HCV) infection have been approved for use in the United States. The initial direct-acting agents were approved in 2011, and many more oral drugs are expected to be approved in the next few years. As new information is presented at scientific conferences and published in peer-reviewed journals, health care practitioners have expressed a need for a credible source of unbiased guidance on how best to treat their patients with HCV infection. To provide healthcare professionals with timely guidance, the American Association for the Study of Liver Diseases (AASLD) and the Infectious Diseases Society of America (IDSA) in collaboration with the International Antiviral Society–USA (IAS–USA) have developed a web-based process for the rapid formulation and dissemination of evidence-based, expert-developed recommendations for hepatitis C management.

New sections will be added, and the recommendations will be updated on a regular basis as new information becomes available. An ongoing summary of “recent changes” will also be available for readers who want to be directed to updates and changes.

### About Hepatitis C

An estimated 3 million to 4 million persons in the United States are chronically infected with HCV, and approximately half are unaware of their status. These



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# AASLD 2016 Guidelines: GT 1a

GT 1a and 1b: 75% of all HCV infections in US

## NO cirrhosis

Elbasvir/grazoprevir X 12 wks (no RAVs)  
Elbasvir/grazoprevir + RBV X 16 wks (+ 5A RAVs )  
Ledipasvir/Sofosbuvir x 12wks (8 wks if < 6 MU)  
Viekira + RBV x 12 wks  
Sofosbuvir + Simeprevir x 12wks  
Daclatasvir + Sofosbuvir x 12 wks

## WITH cirrhosis (compensated)

Elbasvir/grazoprevir X 12 wks (no 5A resistance)  
Ledipasvir/Sofosbuvir x 12 to 24 wks  
*Alternatives:*  
Viekira + RBV x 24 wks  
Sofosbuvir + Simeprevir +/- RBV x 24 wks  
Daclatasvir + sofosbuvir +/- RBV X 24 wks  
Elbasvir/grazoprevir (+ 5A RAVs) + RBV for 16 weeks



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# AASLD Guidelines 2016: GT 1b

GT 1b: easier to treat than GT 1a

<b>NO cirrhosis</b>	<b>Elbasvir/grazoprevir X 12 weeks</b> <b>Ledipasvir/Sofosbuvir x 12wks</b> <b>Viekira x 12 wks</b> <b>Sofosbuvir + Simeprevir x 12 weeks</b> <b>Daclatasvir + Sofosbuvir x 12 wks</b>
<b>WITH cirrhosis (compensated)</b>	Elbasvir/grazoprevir X 12 weeks Ledipasvir/Sofosbuvir x 12 wks Viekira X 12 wks <i>Alternatives:</i> Daclatasvir + Sofosbuvir +/- RBV x 24 wks Sofosbuvir +Simeprevir +/- RBV x 24 wks

# AASLD 2016 Guidelines: Genotype 3

10% of US Infection, more difficult to treat

<b>NO cirrhosis</b>	<b>Daclatasvir + Sofosbuvir x 12 wks</b> <b>Sofosbuvir + RBV + weekly PEGIFN x 12 wks</b> <b>Sofosbuvir + RBV X 24 weeks</b>
<b>WITH cirrhosis (compensated)</b>	Sofosbuvir + RBV + PEGIFN x 12 wks Daclatasvir + Sofosbuvir +/- RBV x 24 wks Sofosbuvir + RBV X 24 weeks

# AASLD: Genotype 2 and 4

GT 2: 13-15% of US Infections

<b>GT 2: NO cirrhosis</b>	<b>Sofosbuvir + RBV x 12 wks</b> <b>Daclatasvir + Sofosbuvir x 12 wks</b>
<b>WITH cirrhosis</b>	<b>Daclatasvir + Sofosbuvir x 16 to 24 wks</b> <b>Sofosbuvir + RBV x 16-24 wks</b>

GT 4: Rare in US, Predominant in Egypt, Middle East, Central Africa

<b>GT 4 NO cirrhosis</b>	<b>Viekira + RBV x 12 wks</b> <b>Elbasvir/grazoprevir X 12 weeks</b> <b>Ledipasvir /Sofosbuvir X 12 weeks</b>
<b>GT4 with cirrhosis</b>	<b>Viekira + RBV X 12 wks</b> <b>Elbasvir/grazoprevir X 12 weeks</b> <b>Ledipasvir /Sofosbuvir X 12 wks</b>

# AASLD 2016: Genotype 5 and 6

**With or  
without  
cirrhosis**

**Ledipasvir /Sofosbuvir X 12 weeks**

**Alternative: Daily sofosbuvir plus RBV plus  
weekly PEG-IFN for 12 weeks**

GT 5: Rare in US, Predominant in South Africa

GT 6: Rare in US, Predominant in Asia



# Including Ribavirin (RBV)

- When necessary: Treatment failures, RAVs, cirrhosis, TE HCV (GT3)
- Weight based RBV unless CrCL <50 cc/min
  - 1000 mg/day in 2 doses if < 75kg or 1200 mg/day if ≥ 75kg
- Patient evaluation for RBV contraindications:
- Side effect monitoring
  - Mood
  - GI
  - Hemolytic anemia (10%) → ↑ Cardiac/Pulmonary sx
    - Monitor CBC baseline, q 2 wk
  - Retinopathy
  - Teratogenicity: pregnancy category X
    - Neg preg test: 2 forms of contraception during and 6 mo after
  - Skin



# Ledipasvir /Sofosbuvir (LDV/SOF)

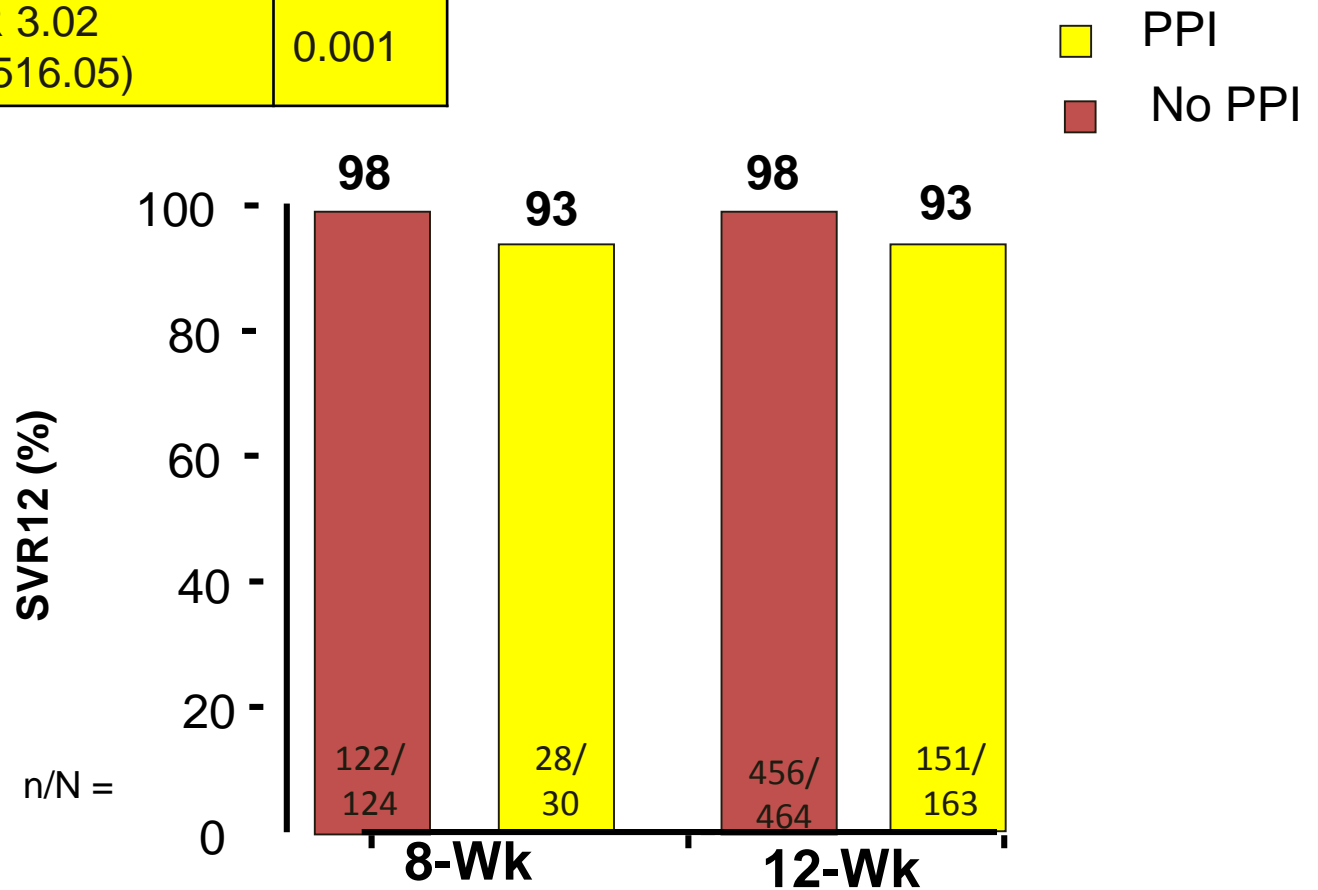
- Inhibitor of HCV NS5A
- Active against GT 1, 4, 5, 6, **not GT 2 or 3**
- Highly effective treatment naïve (TN): SVR 99%
- Fixed dose combo tab: LDV 90 mg/SOF 400 mg
- Take one tablet daily with/without food
- TN: 12 wks but 8 wks if HCV VL < 6 MU, HIV neg
- Avoid if CrCL < 30 cc/min
- Side effects: nausea, fatigue, headache
- Cost: ≈ \$94K (12 weeks)

# Ledipasvir/Sofosbuvir (LDV/SOF) Drug Interactions with Acid Reducing Agents

- **↑ pH ↓ ledipasvir solubility**
  - Antacids: separate from LDV/SOF by 4 hrs
  - H2 RA: together or 12 hr apart, max 40 mg famotidine bid
  - PPI: concurrent omeprazole 20 mg max/day
- Target Study: no PPI: 3.02 OR of achieving SVR
- Try to avoid all, especially PPI despite current labeling

# No Baseline PPI Use on Ledipasvir Sofosbuvir SVR Results (HCV-TARGET)

No PPI @ baseline	OR 3.02 (1.516.05)	0.001
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## Ledipasvir/Sofosbuvir (LDV/SOF) Drug Interactions

- LDV/SOF are p-gp and BRCP substrates
- LDV (but not SOF) are pgp and BRCP inhibitors
- Contraindications: avoid co-administration:
  - Amiodarone: symptomatic bradycardia/cardiac arrest
  - ↓ ledipasvir/sofosbuvir levels and efficacy
    - St. John's wort:
    - Anticonvulsants: Pb, phenytoin, carbamazepine
    - Anti-mycobacterials: rifampin, rifabutin, rifapentine
  - Rosuvastatin: ↑ risk myopathy
    - Use atorvastatin, pravastatin, simvastatin

# Sofosbuvir (SOF, Solvaldi)

- Inhibitor of HCV NS5B polymerase
- Pan-genotypic (GT 1-6) when combined with other DAAs
- SVR rates depend on GT but generally >90%
- One tablet (400 mg) once daily; avoid if CrCL < 30cc/min
- Side effects: nausea, fatigue, headache
- Contraindications: Avoid
  - Amiodarone: symptomatic bradycardia/cardiac arrest
  - ↓ sofosbuvir levels and efficacy d/t pgp induction
    - St. John's wort:
    - Anticonvulsants: Pb, phenytoin, carbamazepine
    - Anti-mycobacterials: rifampin, rifabutin, rifapentine



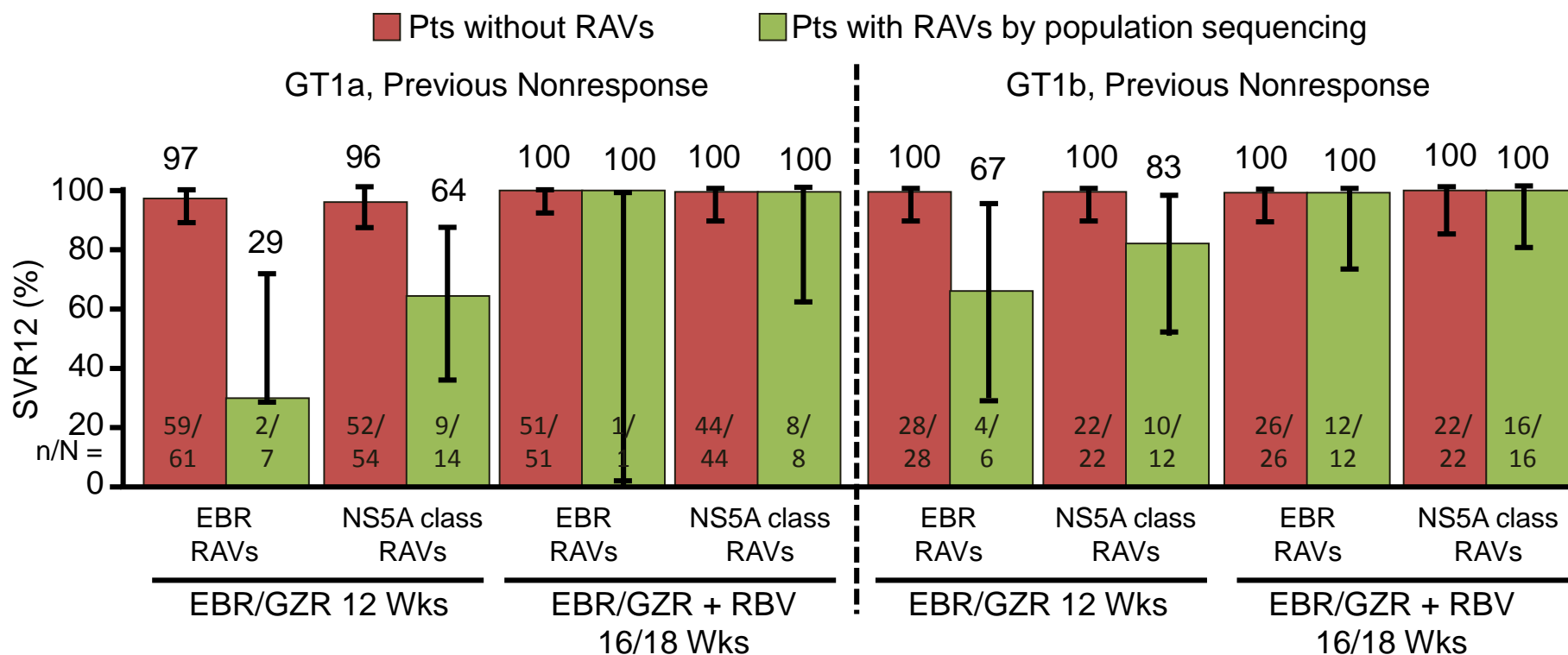
# Grazoprevir/Elbasvir (Zepatier)

- Fixed Dose Combination tablet
- NS5A inhibitor (elbasvir 50 mg) plus grazoprevir 100 mg NS3A/4A protease inhibitor) +/- wt based ribavirin in 2 divided doses
- Genotype 1 and 4, SVR 96-100% (no 5A RAVs)
- GT 1a: NS5A resistance testing before starting
- Cost: \$54,600 X 12 weeks



## SVR12 With Elbasvir/Grazoprevir in GT1 HCV With vs Without Baseline NS5A RAVs

- Tx-naïve or previous relapse, EBR/GZR for 12 wks
  - GT1b: high SVR12 rates (98% to 100%) regardless of EBR or NS5A class RAVs
  - GT1a: SVR12 rates lower with EBR (58%) or NS5A class (86%) RAVs vs no RAVs (98%)



## Grazoprevir/Elbasvir (Zepatier) Dosing

- One tablet once daily without regard to food
- No dose adjustment in ESRD/HD
- Contraindications: Childs Pugh B/C (12fold ↑GZR)
- Treatment duration
  - 12 weeks 1a/no NS5A resistance, GT 1 b, 4
  - 12 weeks + RBV if 1a/1b and PI experienced
  - 16 weeks + RBV 1a/+NS5A resistance
  - 16 weeks if GT4 experienced to PEG IFN/RBV



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## Grazoprevir/Elbasvir (Zepatier)

- Adverse effects:
  - Fatigue (11%), HA(10%), nausea (11%), diarrhea
  - 1% ↑ ALT  $\geq 5$ x ULN@ wk 8+ (6-12 wks):
    - Asymptomatic, resolved on or after treatment
    - ↑ risk in females, Asian, age  $\geq 65$  yr, ↑ GZP levels
- Monitoring:
  - Baseline ALT transaminase, week 8, 12, if 16 wks tx and as indicated
  - Pt educations s/sx of hepatitis



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# Grazoprevir (GZR)/Elbasvir (EBR) and Statin Drug Interactions

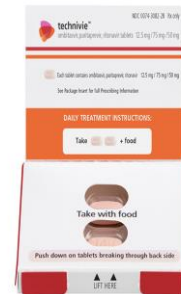
Statins	Outcome
Fluvastatin	Risk of ↑ statin levels and myopathy. Use lowest dose of statins, monitor for statin adverse effects.
Lovastatin	
Simvastatin	
Atorvastatin	DNE 20 mg daily atorvastatin to reduce risk of myopathy
Rosuvastatin	DNE 10 mg daily rosuvastatin to reduce risk of myopathy
Pitavastatin, pravastatin	No interaction, standard dosing

# Paritaprevir-ritonavir-Ombitasvir plus Dasabuvir (PrOD, Viekira Pak)



- Ombitasvir: NS5A inhibitor
- Paritaprevir: NS3/4A protease inhibitor
- Ritonavir: HIV PI booster
- Dasabuvir: Non-nucleoside NS5B polymerase inhibitor
- SVR rates 96-100% GT-1
  - GT 1 and 4 (Technivie);
  - GT1 and CrCL <30/HD:
- Cost: \$83,319 (12 wks)
- 2 tabs (ombitasvir, paritaprevir/r 12.5/75/50 mg) once daily AM plus one 250 mg tab dasabuvir BID (AM/PM); +/-food.
- GT 1a: Wt based RBV 1000mg/day if < 75 kg; 1200 mg/day if > 75kg
- Side effects: nausea, fatigue, insomnia, rash, liver toxicity

## Ombitasvir-Paritaprevir-Ritonavir + Dasabuvir (*Viekira Pak*, *Technivie*) Contraindications



- FDA warning: serious liver injury risk with Viekira Pak and Technivie (Oct 2015): hepatic decompensation and liver failure including liver transplantation or fatalities have been reported mostly in patients with mod-severe cirrhosis (CP B/C): 26 cases; onset 1-4 weeks with fatigue, weakness, loss of appetite, nausea and vomiting, yellow eyes or skin, or light-colored stools in advanced liver disease; ↑ bilirubin (direct)
- Stop ethinyl estradiol-containing medications (alternative contraceptive methods are recommended).
- Monitor hepatic lab testing (T/D. bili, AST/ALT) on all patients q 1-2 wks during the first 4 weeks of treatment.

Contraindicated Drugs with Viekira	Potential Consequences
Alfuzosin HCL (Alpha1 blocker)	Hypotension
Anticonvulsants: Carbamazepine, phenytoin, phenobarbital	Loss of HCV activity
Lipids: Gemfibrozil	⬆ risk of QT prolongation d/t ⬆ dasabuvir levels
Rifampin, St. John's Wort	Loss of HCV activity
Ergots: Ergotamine, ergonovine, dihydroergotamine, methylergonovine	Acute ergot toxicity
Ethinyl estradiol-containing (e.g. combined oral contraceptives)	Potential for ALT elevations
Colchicine	Risk serious/life-threatening reactions (if ⬆LFT/SCr)
Statins: Lovastatin, simvastatin	Risk of myopathy including rhabdomyolysis.
Pimozide, lurasidone	Risk of cardiac arrhythmias
Efavirenz	Risk of elevated transaminases
Sildenafil (REVATIO) for the treatment of pulmonary arterial hypertension	Risk of sildenafil-associated adverse events (e.g. visual disturbances, hypotension, priapism, and syncope.
Triazolam , Oral midazolam	Sedation and respiratory depression
Ranolazine , Dronedarone	Risk life-threatening reactions ( cardiac arrhythmias )

# Daclatasvir (*Daklinza*)

- NS5A inhibitor + sofosbuvir for GT 1, 3, & 2
- SVR GT3: 94-97%, 85-89% w/ cirrhosis
- Cost + sofosbuvir X 12 wks= \$147,000
- Available as 30, 60, 90 mg tablets
- One tablet or 60 mg (standard) once daily w/without food
- ↓ 30 mg daily with 3A4 inhibitors (eg. azoles clarithromycin)
- ↑ 90 mg once daily with 3A4 inducers
- Duration: 12-24 weeks
- No dosage adjustment in renal impairment or in mild, mod, or severe hepatic impairment
- Side effects: HA (14%), fatigue (14%), nausea(5%), d (8%)





# Daclastavir/Sofosbuvir (DCV/SOF)

## Drug Interactions

- DCV is 3A4 substrate; inhibits p-gp, OATP1B1, and BRCP
- SOF are p-gp and BRCP substrates
- Lots of drug interactions with 3A4 inducers/inhibitors
- Contraindications:
  - Amiodarone: symptomatic bradycardia/cardiac arrest
  - ↓ DCV/SOF efficacy: 3A4 inducers (rifampin, anticonvulsants, St John's wort, dexamethasone)
- Caution advised:
  - CCBs (diltiazem, verapamil) ↑ DCV levels
  - Consider holding statins/use cautiously ↑ statin



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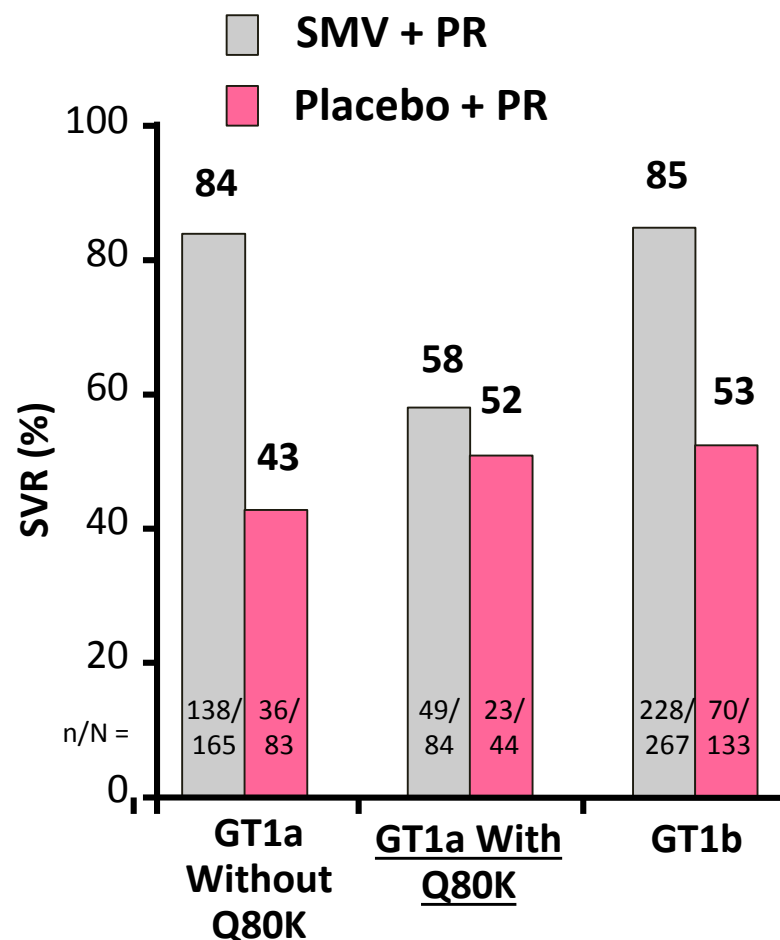


# Simeprevir (Olysio)

- NS3/4A 1st generation protease inhibitor for GT1
- Simeprevir 150 mg (one cap) once daily + sofosbuvir; SVR 97%
- Adverse effects: HA, nausea, rash (sulfa moiety)
- Photosensitivity (sunburn reaction) first 4 weeks
  - Use sunscreen, avoid sunlight and tanning devices
  - May require hospitalization
- Increase bilirubin d/t inhibition of OATP1B1/MRP2 transporters
  - 2 to 4 weeks after initiating therapy
    - Greater risk in cirrhotics
    - Only 0.1% discontinued SMV due to hyperbilirubinemia
- Drug Interactions:
  - Amiodarone: symptomatic bradycardia/cardiac arrest
  - Moderate/strong 3A4 inducers or inhibitors may significantly affect the plasma concentrations of simeprevir

# Simeprevir NS3 Q80K polymorphism

- Per package insert “*Screening patients with HCV genotype 1a infection for the presence of virus with the NS3 Q80K polymorphism at baseline is strongly recommended. Alternative therapy should be considered for patients infected with HCV genotype 1a containing the Q80K polymorphism*”
  - Observed in naïve patients
  - Did not affect SVR rates in treatment experienced G1 subjects



## Case Discussion

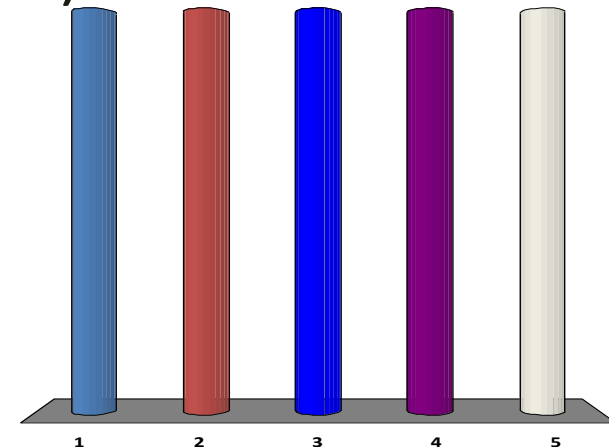
- Case: STP is a 58 y.o. male with GT 1a infection, TN, and cirrhosis.
- Denies varices bleed, ascites, encephalopathy
- PMH: GERD, hypertension, DM2, renal insufficiency
- Labs: HCV VL 128,000 IU/ml
- AST 168, ALT 131 INR 1.5 T. bili 1.5, PLTs 62K, alb 3.4 gm/dl, Scr 1.5, BUN 25, A1c 7% CrCL 50 cc/min
- Allergies: NKA
- Meds: Omeprazole 40 mg daily, amlodipine 10 mg daily, lisinopril 40 mg daily, atorvastatin 80 mg daily, ASA 81 mg daily, glipizide 10 mg daily

# Self-Assessment Question



Which of the following HCV GT 1a direct acting agents for STP would be most effective and result in the lowest risk of overall drug interactions?

1. Sofosbuvir/ledipasvir (Harvoni)
2. Paritaprevir/ritonavir/ombitasvir/dasabuvir (ViekiraPak or PROD) + RBV
3. Sofosbuvir (Sovaldi)/simeprevir (Olysio)
4. Sofosbuvir (Sovaldi)/daclatasvir(Daklinza)
5. Grazoprevir/elbasvir (Zepatier)

atorvastatin, ASA, omeprazole, amlodpine, lisinopril, glipizide



# HCV Drug Interaction Websites

[www.hep-druginteractions.org](http://www.hep-druginteractions.org)

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Providing clinically useful, reliable, up-to-date, evidence-based information

## INTERACTIONS WITH TELAPREVIR AND BOCEPREVIR

### Telaprevir & Boceprevir Interactions


A chart summarising the interactions of telaprevir and boceprevir with other drugs has been produced from data in the public domain. Telaprevir and boceprevir will be added as columns to the interaction charts when licensed.

[Click here for telaprevir & boceprevir interactions \(pdf file\).](#)



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## Chart Updates

The interaction charts have been updated to include data presented at recent meetings. A n...

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## Customised Interaction Charts and PDF Generator

The interaction charts now have the option to build a customised table of interactions.

# HCV Clinical Consultation Service: Topics Discussion **During Treatment**

- Drug Selection
- Dosing and duration
- **Monitoring**
- Drug interactions
- Access
- Complications



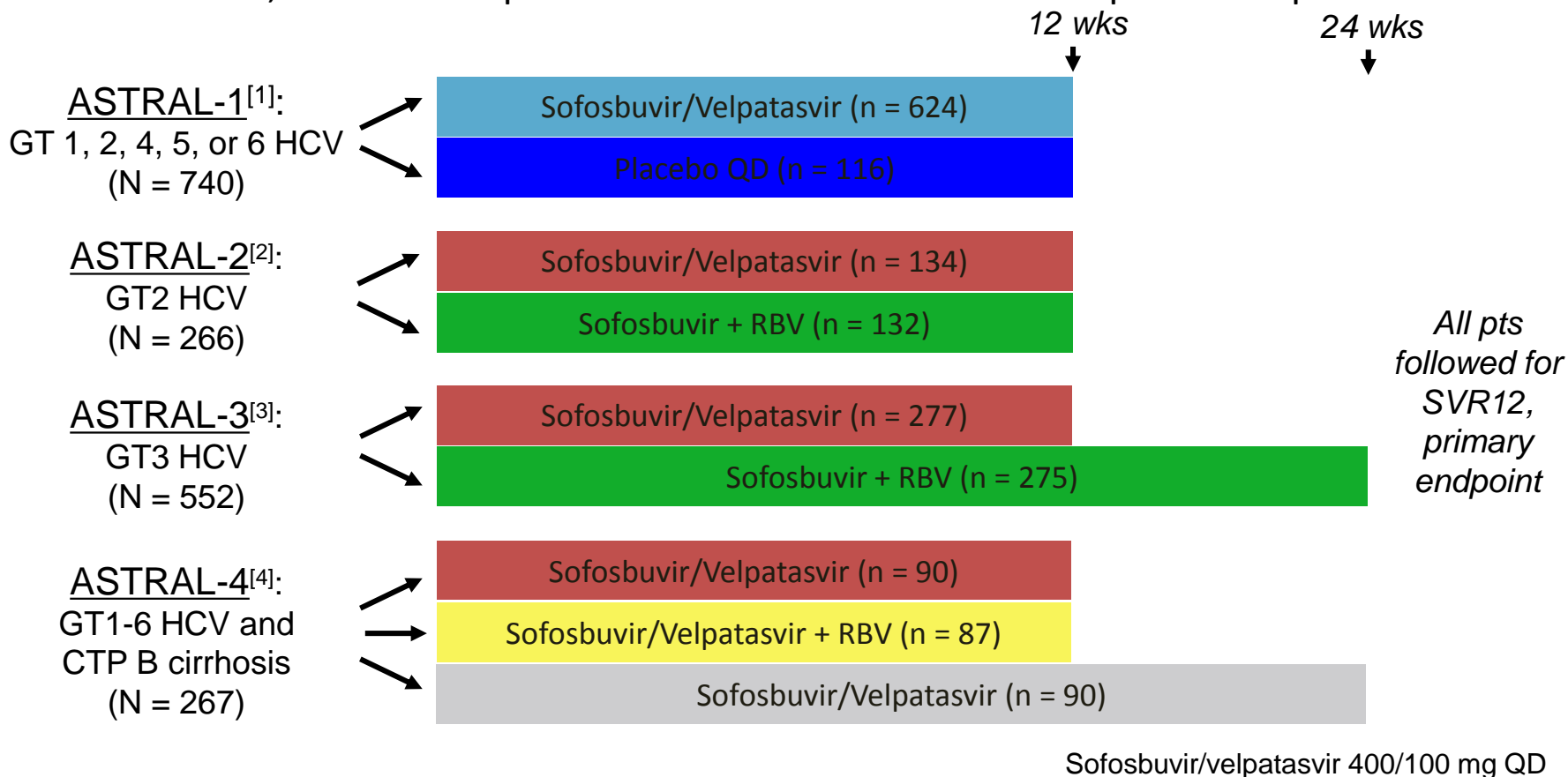
# What Does the Future Hold?



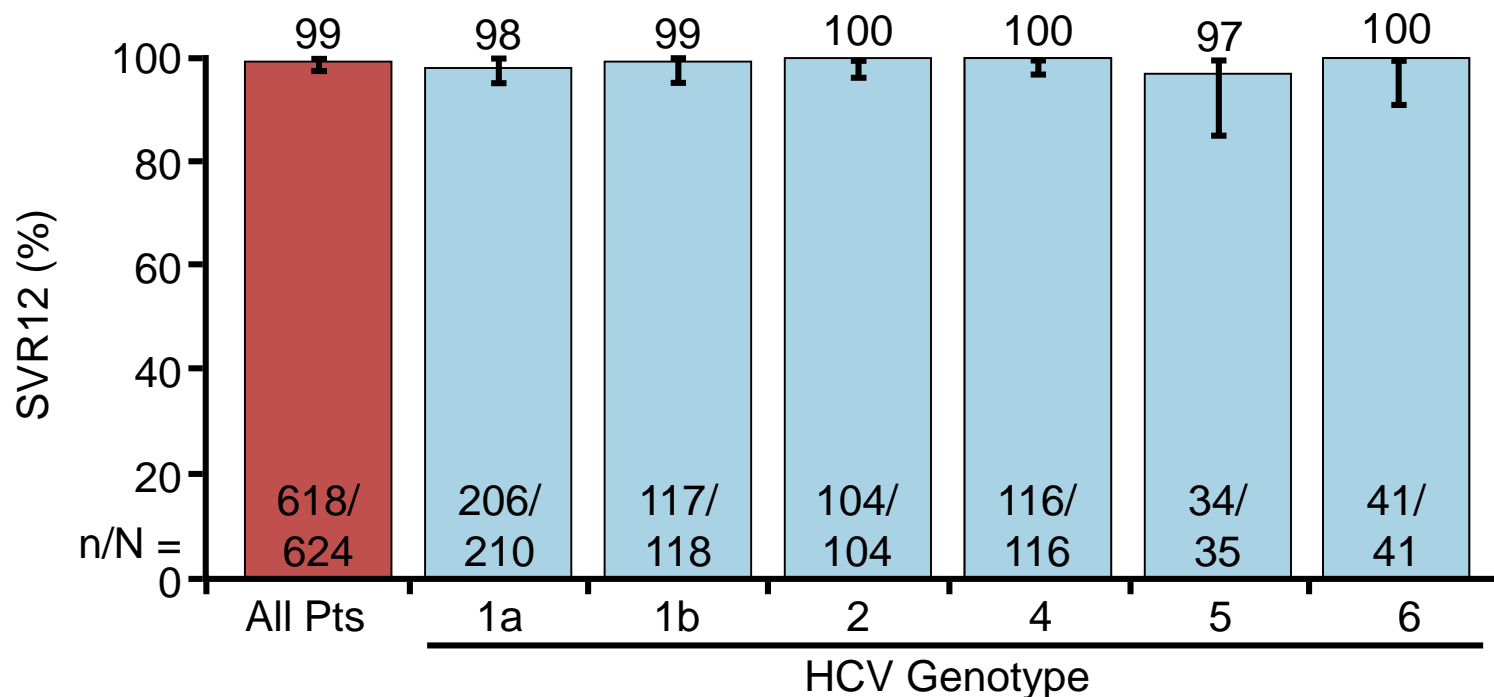
- Pan-genotypic 2<sup>nd</sup> gen NS5a inhibitors (Velpatasvir, Gilead's 5816) will hopefully will retain activity against resistant virus.
- Fixed dose combination (Velpatasvir + Sofosbuvir)  
Likely approval end of June/ early July 2016.
- Both Gilead and Merck are developing "triplet combinations" consisting of a HCV nucleoside inhibitor, second generation NS5a inhibitor, and 3rd or 4th generation HCV Protease Inhibitor.

## Astral 1-4: Sofosbuvir/ Velpatasvir FDC ± RBV in GT1-6

- Multicenter, randomized phase III trials in Tx-naïve and Tx-experienced pts



## ASTRAL-1: SVR12 With Sofosbuvir/ Velpatasvir in GT1, 2, 4, 5, 6 HCV



## ASTRAL-1: Safety of Sofosbuvir/ Velpatasvir in GT1, 2, 4, 5, 6 HCV

Safety Outcome, %	Placebo 12 Wks (n = 116)	Sofosbuvir/Velpatasvir 12 Wks (n = 624)
Any AE	77	78
Grade 3/4 AE	< 1	3
Serious AE	0	2
Discontinuation for AE	2	< 1
Death	0	< 1*
Laboratory abnormalities		
▪ Grade 3/4	12	7
▪ Hemoglobin < 10 g/dL	0	< 1
AEs in ≥ 10% pts		
▪ Headache	28	29
▪ Fatigue	20	20
▪ Nasopharyngitis	10	13
▪ Nausea	11	12

\*1 pt died during sleep 8 days after Tx completion; deemed by investigator to be unrelated to study drug.

# Indian Health Services Hepatitis C Consultation Service

9 am – 8 pm EST, Monday - Friday

Hepatitis C Mono- and Co-infection Consultation: 844-437-4636

The Clinician Consultation Center (CCC) provides IHS clinicians of all experience levels free, confidential, and timely expert consultation by physicians and clinical pharmacists with expertise in HIV and HCV care.

Advice is based on Federal treatment guidelines, VHA guidelines, current medical literature, and clinical best practices.

Our team includes: Betty Dong , Joanna Eveland, Rena Fox , Alex Monto, Marion Peters





CLINICIAN CONSULTATION CENTER

National rapid response for HIV management and bloodborne pathogen exposures.



CLINICIAN-TO-CLINICIAN ADVICE

Thank you!  
Email: [dong.betty@ucsf.edu](mailto:dong.betty@ucsf.edu)