Updates Gastroenterology and Hepatology

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Disclosure

- Speaker Bureau/Advisory Council- Bristol Meyer Squibbs

“Whirlwind” tour of GI and Hepatology (and Endoscopy)

- IBD Treatment-abbreviated, related to COVID
- Hepatology
- Motility
- Endoscopy
- Colon cancer screening guideline

IBD Medications

IBD Med Options

- Brief review
- Table-options for UC and CD

IBD Background

- Ulcerative colitis (UC) and Crohn's disease (CD) are both idiopathic inflammatory conditions.
- UC only affects the large intestine while CD can affect any part of the gastrointestinal (GI) tract from the mouth to the rectum.
- UC is associated with continuous inflammation (95% rectal involvement) while CD is associated with skip areas of inflammation and granulomas, usually with terminal ileal (TI) involvement, strictures and fistulas.
- The age distribution is usually 15-40 years old.
- Both diseases are associated with anxiety and depression as well as dysplasia and colorectal cancer due to long standing inflammation.

Markers of Disease Activity

- ESR and CRP are non-specific markers of inflammation but can correlate with endoscopic severity of disease and predict risk of colectomy as well as response to therapy.
- Measurement of Hgb and albumin at diagnosis may also predict disease severity and prognosis.
- Fecal leukocyte measurement is not Sn or Sp for the diagnosis of UC or CD.
- Fecal calprotectin (FC) is a neutrophilic marker of inflammation elevated in infectious and inflammatory causes of diarrhea.
- FC can be used as a non invasive marker to assess disease activity and response to treatment.
- The Sn of FC for UC is 0.88 and Sp is 0.79.
- pANCA can be found in 70% of pts with UC.However, pANCA positivity is associated with refractory UC.
- pANCA and anti sacchromyces cervisiae Ab plus pANCA has been used to diagnose UC but the Sn is low (therefore not recommended).

Poor Prognostic Factors

- Precipitants of disease:
  - Smoking cessation
  - NSAIDs
  - Enteric infections (like C. Diff)
- Poor prognostic factors in UC: Age <40 at diagnosis, extensive colitis, severe endoscopic disease, hospitalization for colitis, elevated CRP, low serum albumin; the greater the # of factors, the worse the prognosis measured by likelihood of colectomy.
- In CD, features that are associated with a high risk for progressive disease burden include young age at diagnosis, initial extensive bowel involvement, ileal/ileocolonic involvement, perianal/severe rectal disease, and patients presenting with a penetrating or stenosis disease phenotype.Visceral adiposity may be a marker for increased risk of penetrating disease.

IBD Flare Admission Pearls

- Rule out infectious colitis.
- Imaging (X-ray) to rule out megacolon.
- IV steroids at a total dose of 60 mg/day.
- If no response to IV steroids in 3-5 days, consider flexible sigmoidoscopy to rule out CMV colitis, Infliximab therapy and surgery consult.
- If C. difficile develops in IBD, Vancomycin is first line therapy at 125 mg QID for 14 days.
- Avoid NSAIDs, opiates and anticholinergics.
- DVT prophylaxis is necessary.

Ulcerative Colitis	Crohn's Disease
Azathioprine	Azathioprine
6-MP	6-MP
Infliximab	Methotrexate
Adalimumab	Infliximab
Golimumab	Adalimumab
Tofacitinib	Certolizumab Pegol
Vedolizumab	Vedolizumab
Ozanimod	Natalizumab
Upadacitinib	Ustekinumab
	Risankizumab

Anti-TNF side effects/associations

Acute sinusitis, reactivation of TB and Hep B (test before iniation of therapy), pneumonia, fungal infections, acute infusion reactions, delayed hypersensitivity reactions, myalgias, arthralgias, fever (2-12 days after infusion), and formation of autoAbs (ANA and anti-dsDNA) which can lead to lupus-like reaction. Rare severe hepatic necrosis.

NHL has been associated (debatable small increased risk) but there is a HIGH risk of HSTCL when infliximab or adalimumab have been used with AZA and 6-MP in young males <35 YO (with AZA and 6-MP use at least 2 or more years).

There is also an increased risk of skin cancer, especially melanoma. Do recommend yearly skin exams for IBD patients.

Health Maintenance

CCFA Health Maintenance Checklist for Adult IBD Patients

Vaccine-Preventable Illnesses	Which Patients	How Often
Influenza (inactive)	All	Annually
Pneumococcal PCV13	If on/planning immunosuppression	Once[1]
Pneumococcal PPSV23	If on/planning immunosuppression	At baseline, repeat in 5 years
Tdap	All	Every 10 years
HPV	All aged 18-26	Once (3 doses within 6 mos.)
Meningococcal meningitis	All adult patients at risk of meningitis	Once
Hepatitis A	If non-immune	Once (2 doses within 6 mos.)
Hepatitis B	If non-immune	Once (3 doses within 6 mos.)
MMR (live vaccine)	If non-immune[2]	Once (1-2 doses)
Varicella (live vaccine)	If non-immune[2]	Once (1-2 doses within 6 mos.)
Zoster (live vaccine)	All aged > 50 years[3]	Once

Cancer Prevention	Which Patients	How Often
Cervical PAP smear	All on systemic immunosuppression[4]	Annual
Skin screen	All on systemic immunosuppression[4]	Annual
Colonoscopy	All with extensive disease for >8 years	Every 1-3 years

Other Screenings	Which Patients	How Often
DEXA Scan	High risk; women with low BMI, post-menopausal, chronic steroid exposure	At least 2 years apart
PPD or IGRA	Prior to anti-TNF or anti-IL-12/23	Once
Smoking status	All	Annual
Depression check	All	Annual

The evidence base for this checklist varies from "insufficient to assess benefits" to "moderate net benefits."

Developed by the CCFA Professional Education Committee Sub-Group: Alan Moss MD, Francis Farraye MD, MSc, Glenn Gordon MD, Raluca Vrabie MD • Approved by Committee Chairs: Samir Shah MD, Millie Long MD • V2_January_2017

1. Recommended timing of serial pneumococcal vaccination with both PPSV23 and PCV13 available in ACIP recommendation
2. Patients treated with systemic immunosuppressive therapy (steroids, thiopurines, anti-TNFs) should not receive live (attenuated) vaccines e.g. measles, mumps, rubella, nasal influenza, varicella, and yellow fever
3. Patients receiving anti-TNFs, anti-IL-12/23, or >20 mg prednisone should NOT be given the live zoster vaccine. Vaccine can be administered if on methotrexate < 0.4 mg/kg/wk, 6-mercaptopurine < 1.5 mg/kg/d or azathioprine <3 mg/kg/d
4. "Systemic immunopsuppression" currently includes azathioprine, mercaptopurine, methotrexate, anti-TNFs, anti-IL-12/23

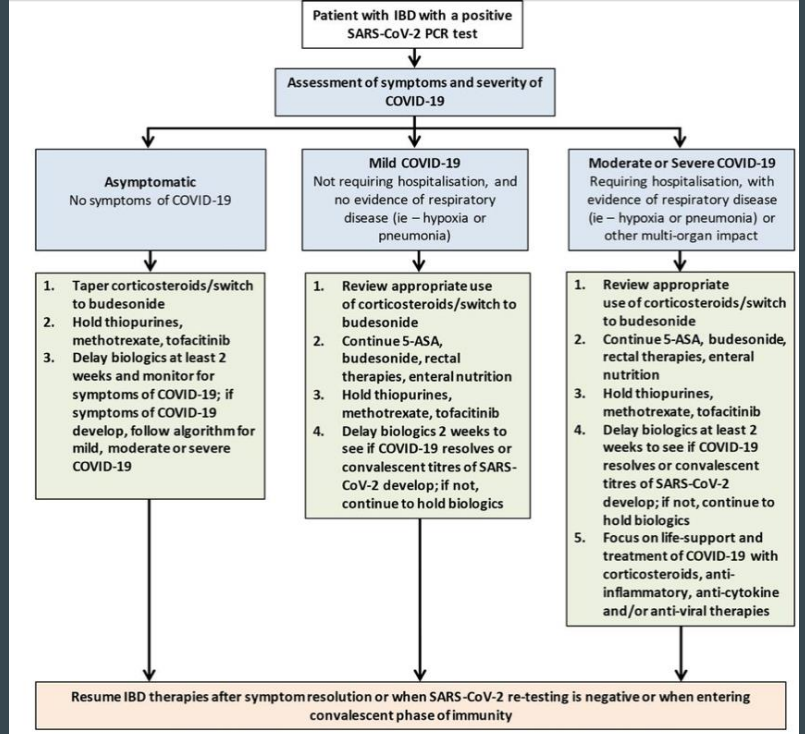
ADDITIONAL INFORMATION

- ACG
- ACIP
- ACOG
- AGA
- National Cancer Institute
- National Osteoporosis Foundation
- PHQ-9 Depression Survey
- US Preventive Services Task Force (USPSTF) Osteoporosis
- USPSTF Tobacco

CROHN'S & COLITIS FOUNDATION OF AMERICA

COVID19 Vaccination Guidance

- Patients with inflammatory bowel disease (IBD) did not have an increased risk of COVID-19, and had largely similar outcomes, including hospitalisation, intensive care admission and mortality, compared with the general population.
- Risk factors for adverse outcomes to COVID-19 in patients with IBD include advanced age, increasing number of comorbidities, corticosteroid use and increased IBD activity.
- Biological-treated patients with IBD who do not have COVID-19 should continue with their pre-pandemic IBD therapies and not be switched electively.
- There is no evidence to suggest an increased risk of de novo, or delayed, IBD diagnoses, however, an overall decrease in endoscopy procedures during the pandemic has led to a rise in the number of missed endoscopic-detected cancers.
- Patients with IBD should be encouraged to receive a complete course of SARS-CoV-2 vaccine, at any point during their treatment cycle, and be counselled that vaccine response may be attenuated when receiving systemic corticosteroids, antitumour necrosis factor monotherapy or combination therapy, and Janus kinase inhibitors.
- A third dose (or booster) of COVID19 vaccine for all patients with IBD receiving immunosuppressive treatment and all patients with IBD that are extremely clinically vulnerable.



Clinical notes:

1) The International Organization for the Study of Inflammatory Bowel Diseases recommended that patients without symptoms but positive for SARS-CoV-2 withhold IBD therapies for a minimum of 10 days. In patients with a positive test for SARS-CoV-2 and symptoms of COVID-19, IBD therapy should also be withheld, and restarted when at least 3 days (72 hours) have passed since recovery, there is improvement in respiratory symptoms, and at least 10 days have passed since symptoms first appeared.

2) The severity of COVID-19 should be weighed up against IBD disease activity, and careful risk–benefit assessment regarding treatments for COVID-19 and escalating treatments for IBD should be considered on an individual basis

3) Guidance from early on in the pandemic recommended tapering of systemic steroids in patients with IBD and confirmed SARS-CoV-2 infection, however, decisions regarding risk-benefit ratio should be made in light of active IBD symptoms, and also take into consideration the role of steroids in the management of COVID-19 infection

4) Recommendations are largely based on expert consensus due to limited published data

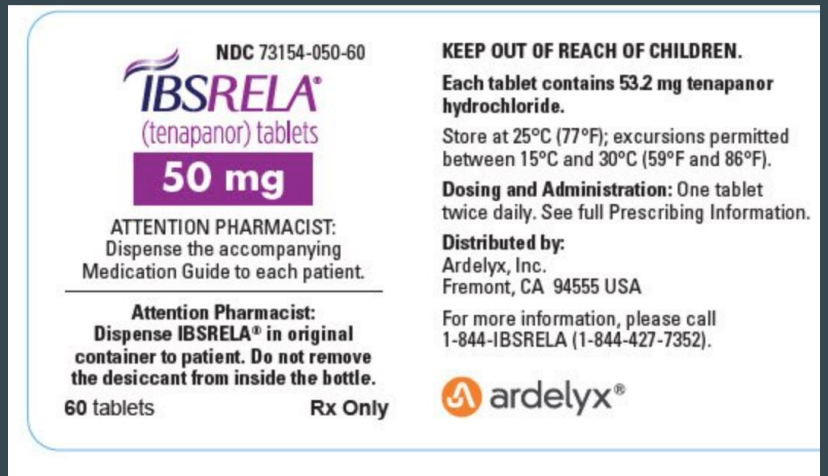
IBS Medications

Tenapanor (Ibsrela)

Indicated for the treatment of IBS-C in adults.

Mechanism is NH3E inhibition, reduces Na reabsorption and increases water secretion into the lumen of the small intestine and colon.

Dosed as 50 mg BID or QD (once immediately before breakfast and once before dinner).



Eluxadoline (Viberzi)

- IBS-D only
- Mu/opoid agonist, delta antagnost
- Contraindications-pancreatitis (effect near papilla), Sphincter of Oddi dysfunction, gallbladder absent, alcohol abuse
- 75mg and 100mg bid
- Schedule IV
- Counsel patients

Lubiprostone (Amitiza)

24 micrograms BID for constipation

8 micrograms BID for IBS-C

Opens ClC-2 chloride channels on the apical surface of enterocytes by a direct effect.

Improves stool frequency in constipation and reduces symptoms of IBS with constipation. “Sense of incomplete evacuation.”

May increase luminal fluid secretion, affect epithelial permeability, or modify the regulatory function of the gut to produce these effects.

Linaclotide (Linzess)

72 or 145 micrograms daily for constipation

290 micrograms daily for IBS-C

Not found in bloodstream.

CI-less than age 18, obstruction.

Improvement with abdominal pain in 2-3 months

A guanylin analog. Stimulates the guanylyl cyslase-C receptor on the apical surface of enterocytes, increasing intracellular cGMP concentrations. This opens the CFTR channel and stimulates enterocyte chloride secretion.

Plecanatide (Trulance)

3 mg QD (IBS-C and constipation)

A uroguanylin analog which also has an effect on the guanylyl cyclase-C receptor. More small bowel activity compared to other agents.

There is some evidence that linaclotide and plecanatide cause enterocyte release of cGMP into the basolateral space which may inhibit nociceptive nerves of the enteric nervous system.

Rifaximin (Xifaxan)

Approved for traveler's diarrhea, hepatic encephalopathy (550mg bid daily), SIBO, and IBS-D.

Non absorbable antibiotic that binds the beta subunit of bacterial RNA polymerase and inhibits transcription process.

Dose 550 mg TID for IBS for 2 weeks

Rifaximin (Xifaxan)

- “Real world experience”
  - Need to fail dietary changes, failed OTC anti-diarrheal, failed antispasmodic.
  - Failed antidepressant-TCA? Challenging hurdle.
  - Restores balance to GI tract/microbiome

Dupilumab (Dupixent) for Eosinophilic Esophagitis

- The first and only biologic approved for EoE
- This is a weekly subcutaneous injection used to treat adults and children 12 years of age and older, who weigh at least 88 pounds (40 kg), with eosinophilic esophagitis (EoE). It is not known if DUPIXENT is safe and effective in children with eosinophilic esophagitis under 12 years of age and who weigh at least 88 pounds (40 kg).
- DUPIXENT was studied in a pair of 24-week clinical trials with adults and pediatric patients aged 12-17 who weigh at least 88 lb (40 kg) with eosinophilic esophagitis (EoE), most of whom had a history of prior use of swallowed topical corticosteroids for the treatment of EoE.
- It was proven to reduce difficulty swallowing and eosinophils in the esophagus based on clinical trials with 240 adult and pediatric patients (12+ years) with EoE at Week 24.
- **The most common side effects in patients with eosinophilic esophagitis include** injection site reactions, upper respiratory tract infections, cold sores in your mouth or on your lips, and joint pain (arthralgia).

Motility

Prucalopride (Motegrity)

2 mg QD (acts systemically)

Full agonist at 5-HT-4 receptors that enhances peristalsis and reduces visceral pain but does not interact with the cardiac K+ channel that occasionally caused cardiac arrhythmias with other 5-HT-4 receptor agonists.

Approved for chronic constipation.

Off label for gastroparesis.

Gastroparesis

- Gimoti (metoclopramide)-nasal delivery
  - No reports of tardive dyskinesia
- Reglan side effects-d/w patient and document
- 6 small meals a day
- RD eval
- EGD with Botox-50% response rate
- Surgery-severe cases
- Gastric pacer

Gimoti (Intranasal Metoclopramide/Reglan)

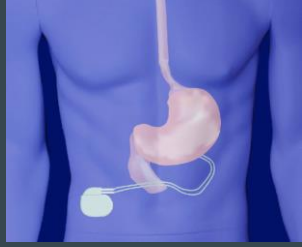
- Absorbed directly into the bloodstream from the nose
- No need to pass through the stomach to start working
- Symptom relief is not affected by delayed stomach emptying
- Unlike pills that may not get absorbed, GIMOTI can work even when you are feeling nauseated or vomiting.
- In a clinical study, women who started out with moderate to severe symptoms found relief as early as 1 week after taking GIMOTI2
- You should not take GIMOTI for more than 8 weeks at a time, and you should not take products containing metoclopramide (including GIMOTI) for more than 12 weeks at a time.
- In clinical trials, the most common side effects reported were unpleasant taste after dosing, headache, and tiredness.
- During the clinical development program for GIMOTI, there were no reports of TD. The data suggest that the risk of TD from using metoclopramide is likely to be less than 1%. The absolute risk of TD is still not known, and further studies are required.

Dosing:

Adults less than 65 years of age: The recommended dosage is 1 spray (15 mg) in one nostril, 30 minutes before each meal and at bedtime (maximum of 4 sprays daily) for 2 to 8 weeks, depending on symptomatic response.

Adults 65 years of age and older: GIMOTI is not recommended in geriatric patients as initial therapy. Geriatric patients receiving an alternative metoclopramide product at a stable dosage of 10 mg four times daily can be switched to GIMOTI 1 spray (15 mg) in one nostril, 30 minutes before each meal and at bedtime (maximum four times daily) for 2 to 8 weeks, depending on symptomatic response.

Gastric Electrical Stimulators (Enterra)



Approved by the FDA through a Humanitarian Device Exemption for patients with diabetic and idiopathic gastroparesis.

Available in your region?

Symptomatic improvement despite absence of objective improvement in gastric emptying.

Activates central mechanisms for controlling n/v, enhanced relaxation of the fundus that increases gastric accommodation, augmentation of the postrandial gastric slow wave amplitude, and enhanced vagal function.

Predictors of suboptimal response: chronic use of narcotic analgesics, predominance of abdominal pain, and history of migraines.

These stimulators have somewhat greater efficacy in diabetic and post surgical patients than in those with idiopathic gastroparesis.

Sucraid-difficult IBS case

For treatment of Congenital Sucrase-Isomaltase deficiency (CSID).

Patients experience a decreased ability to break down sugars and starches which are then fermented by bacteria causing symptoms similar to those in SIBO. Diarrhea, gas and abdominal pain can occur after a meal containing these.

Diagnosed via Hydrogen breath test.-Mail in

1 mL (8,500 IU; one full measuring scoop; use the white plastic scoop provided in your box of Sucraid®) per meal or snack for infants, toddlers, and small children weighing up to 15 kg (33 lb)

2 mL (17,000 IU; two full measuring scoops) per meal or snack for older children and adults weighing over 15 kg (33 lb)

Each dose should be diluted in 2 to 4 ounces of water, milk or infant formula.

It is recommended that approximately half the dosage be taken at the beginning of each meal or snack and the remainder of the dosage taken during the meal or snack.

H. Pylori Treatment

- Bismuth quadruple (Pylera therapy)
- Levofloxacin triple
- Concomitant(Clarithromycin based)

Talicia (omeprazole, amoxicillin, and rifabutin)

Eradication rate of 90% in those who took the medication for 14 days.

Dosed as 4 pills every 8 hours for 14 days.

Other combination pills like Pylera do not contain PPI and PPI needs to be taken in addition to Pylera combination pill.

Most common side effects are nausea, vomiting, indigestion, diarrhea, mouth pain, orange urine/sweat (due to the rifabutin).

Hepatitis B/C Medications

Chronic Hepatitis B treatment: Entecavir

0.5 mg QD

SE: lactic acidosis (decompensated cirrhosis only)

Monitoring on tx: Cr Cl at baseline; if at risk/renal impairment: Cr Cl, phosphate, urine glucose and protein at least annually; consider bone density at baseline and during tx in pts with hx of fracture or risks for osteopenia; lactic acid levels if thre is clinical concern; test for HIV before tx initiation

Chronic Hepatitis B treatment: Tenofovir Alafenamide

25 mg QD

SE: lactic acidosis

Monitoring on tx: Lactic acid levels if clinical concern; assess Cr, phosphorous, Cr Cl, urine glucose and protein before starting and during tx in all pts as clinically appropriate; test for HIV before tx initiation

Lower rates of bone and renal abnormalities; preferred in pts that have concern for renal or bone disease

Chronic Hepatitis B treatment: Tenofovir Disoproxyl Fumarate

300 mg QD

SE: neuropathy, Fanconi syndrome, osteomalacia, lactic acidosis

Monitoring on tx: eAg positive: monitor ALT and HBV DNA for evidence of resistance

Can be used in pregnant patients.

Hep C

- Challenges-
  -Insurance coverage
  - Insurance coverage
  - Insurance coverage
  - Insurance coverage

Different plans with different guidelines to have treatment approved

Hep C/FIB-4

- Online calculator
- Patient age/AST/ALT/plt count
- Cut off less than 1.45-NPP of 90% for advanced fibrosis
- >3.25-97% specific and 65%PPP for advanced fibrosis

$$\text{FIB-4} = \frac{\text{Age (years)} \times \text{AST (U/L)}}{\text{Platelet Count } (10^9/\text{L}) \times \sqrt{\text{ALT (U/L)}}}$$

Classes of Medications Used for Treatment

NS3-4A Protease Inhibitors ("previr")**	NS5A Inhibitors ("asvir")	NS5B Inhibitors: ("buvir")		Other
		Nucleoside Analogues	*Non-Nucleoside Analogues*	
Glecaprevir	Daclatasvir	Sofosbuvir	Dasabuvir	Ribavirin
Grazoprevir	Elbasvir			
Paritaprevir	Pibrentasvir			
Voxilaprevir	Ledipasvir			
	Ombitasvir			
	Velpatasvir			

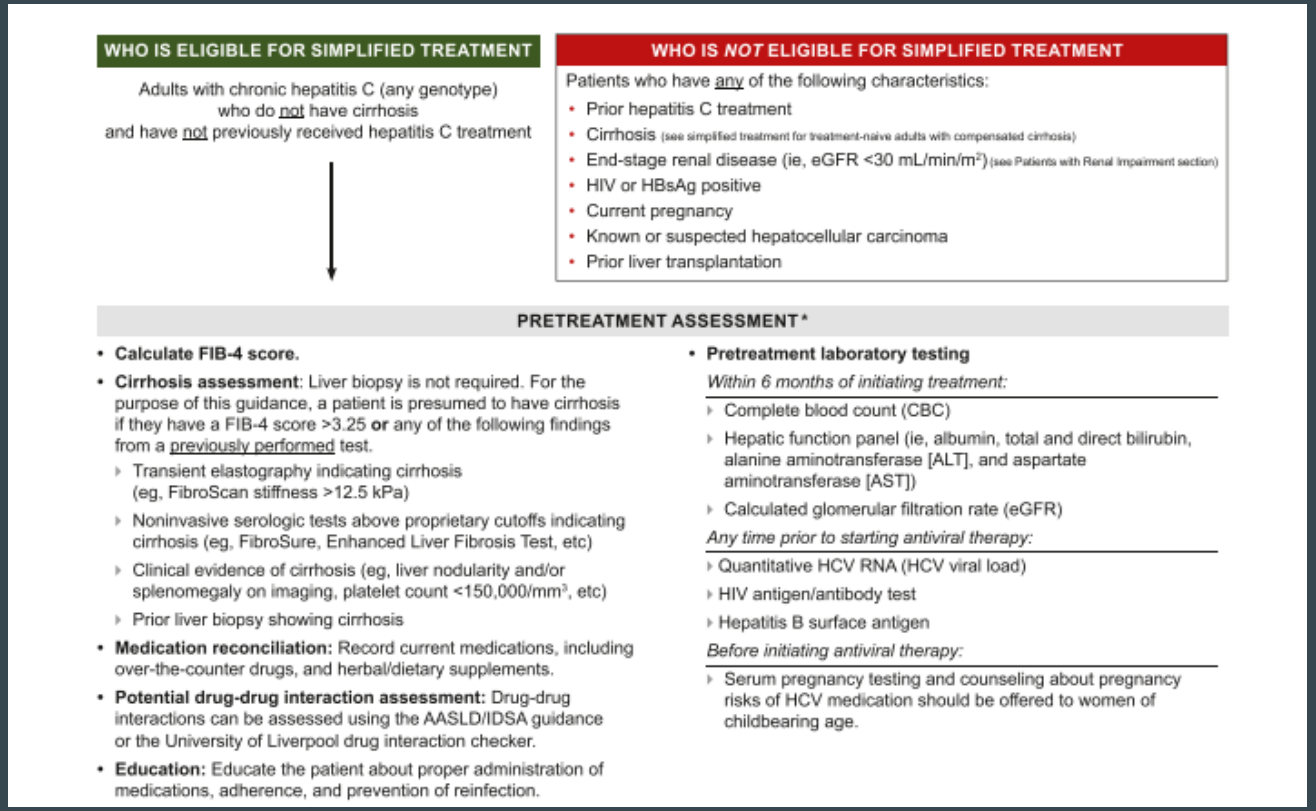
** cannot use in decompensated disease

Combination Therapies

Combination Therapies		Trade Name	GFR < 30	Decompensated Cirrhosis
Elbasvir/**Grazeprevir**	GZR/EBR	Zepatier®	Yes	No
Glecaprevir/Pibrentasvir	GLE/PIB	Mavyret®	Yes	No
Ledipasvir/Sofosbuvir	LDV/SOF	Harvoni®	No	Yes
Sofosbuvir/Velpatasvir	SOF/VEL	Epclusa®	No	Yes
Sofosbuvir/Velpatasvir/ **Voxilaprevir**	SOF/VEL/VOX	Vosevi®	No	No

Bold = protease inhibitor

Hep C Treatment: Tx naive withOUT cirrhosis OR compensated cirrhosis



WHO IS ELIGIBLE FOR SIMPLIFIED TREATMENT

Adults with chronic hepatitis C (any genotype)
who do not have cirrhosis
and have not previously received hepatitis C treatment

WHO IS *NOT* ELIGIBLE FOR SIMPLIFIED TREATMENT

Patients who have any of the following characteristics:

- Prior hepatitis C treatment
- Cirrhosis (see simplified treatment for treatment-naive adults with compensated cirrhosis)
- End-stage renal disease (ie, eGFR <30 mL/min/m^2) (see Patients with Renal Impairment section)
- HIV or HBsAg positive
- Current pregnancy
- Known or suspected hepatocellular carcinoma
- Prior liver transplantation

PRETREATMENT ASSESSMENT*

- **Calculate FIB-4 score.**
- **Cirrhosis assessment**: Liver biopsy is not required. For the purpose of this guidance, a patient is presumed to have cirrhosis if they have a FIB-4 score >3.25 **or** any of the following findings from a previously performed test.
  - Transient elastography indicating cirrhosis (eg, FibroScan stiffness >12.5 kPa)
  - Noninvasive serologic tests above proprietary cutoffs indicating cirrhosis (eg, FibroSure, Enhanced Liver Fibrosis Test, etc)
  - Clinical evidence of cirrhosis (eg, liver nodularity and/or splenomegaly on imaging, platelet count <150,000/mm^3, etc)
  - Prior liver biopsy showing cirrhosis
- **Medication reconciliation:** Record current medications, including over-the-counter drugs, and herbal/dietary supplements.
- **Potential drug-drug interaction assessment:** Drug-drug interactions can be assessed using the AASLD/IDSA guidance or the University of Liverpool drug interaction checker.
- **Education:** Educate the patient about proper administration of medications, adherence, and prevention of reinfection.

- **Pretreatment laboratory testing**

Within 6 months of initiating treatment:

- Complete blood count (CBC)
- Hepatic function panel (ie, albumin, total and direct bilirubin, alanine aminotransferase [ALT], and aspartate aminotransferase [AST])
- Calculated glomerular filtration rate (eGFR)

Any time prior to starting antiviral therapy:

- Quantitative HCV RNA (HCV viral load)
- HIV antigen/antibody test
- Hepatitis B surface antigen

Before initiating antiviral therapy:

- Serum pregnancy testing and counseling about pregnancy risks of HCV medication should be offered to women of childbearing age.

Hep C Treatment: Tx naive withOUT cirrhosis OR compensated cirrhosis

[MAVYRET] **RECOMMENDED REGIMENS*** [EPCLUSA]

Glecaprevir (300 mg) / pibrentasvir (120 mg)
taken with food for a duration of 8 weeks

Sofosbuvir (400 mg) / velpatasvir (100 mg)
for a duration of 12 weeks

ON-TREATMENT MONITORING

- Inform patients taking diabetes medication of the potential for symptomatic hypoglycemia. Monitoring for hypoglycemia is recommended
- Inform patients taking warfarin of the potential for changes in their anticoagulation status. Monitoring INR for subtherapeutic anticoagulation is recommended.
- No laboratory monitoring is required for other patients.
- An in-person or telehealth/phone visit may be scheduled, if needed, for patient support, assessment of symptoms, and/or new medications.

POST-TREATMENT ASSESSMENT OF CURE (SVR)

- Assessment of quantitative HCV RNA and a hepatic function panel are recommended 12 weeks or later following completion of therapy to confirm HCV RNA is undetectable (virologic cure) and transaminase normalization.
- Assessment for other causes of liver disease is recommended for patients with elevated transaminase levels after achieving SVR.

FOLLOW-UP AFTER ACHIEVING VIROLOGIC CURE (SVR)

- No liver-related follow-up is recommended for noncirrhotic patients who achieve SVR.
- Patients with ongoing risk for HCV infection (eg, intravenous drug use or MSM engaging in unprotected sex) should be counseled about risk reduction, and tested for HCV RNA annually and whenever they develop elevated ALT, AST, or bilirubin.
- Advise patients to avoid excess alcohol use.

FOLLOW-UP FOR PATIENTS WHO DO *NOT* ACHIEVE A VIROLOGIC CURE

- Patients in whom initial HCV treatment fails to achieve cure (SVR) should be evaluated for retreatment by a specialist, in accordance with AASLD/IDSA guidance.
- For patients unable to be retreated, assessment for disease progression every 6 to 12 months with a hepatic function panel, CBC, and INR is recommended.
- Advise patients to avoid excess alcohol use.

AASLD

*More detailed descriptions of the patient evaluation process and antivirals used for HCV treatment, including the treatment of patients with cirrhosis, can be found at www.hcvguidelines.org. Updated: December 10, 2019 © 2019 American Association for the Study of Liver Diseases and the Infectious Diseases Society of America.

IDSA
Infectious Diseases Society of America

Chronic Hepatitis C treatment: Mavyret

G 1a/b, 2, 3, 4, 5, 6-pangenotype

Cirrhotic and non cirrhotic with CKD 4 or 5, post tx

Chronic Hepatitis C treatment: Harvoni

Tx naive g 1a/b, 4, 5, 6 non-cirrhotics: 12 wks

Tx naive g 1a/b, 4, 5, 6 cirrhotics: 12 wks

Chronic Hepatitis C treatment: Epclusa

Cirrhotic and non cirrhotic g 1a/b, 2, 3, 4, 5, 6

Chronic Hepatitis C treatment: Vosevi

G 1, 2, 3, 4, 5, 6 or those previously treated with DAAs

Chronic Hepatitis C treatment: Zepatier

Tx naive non cirrhotics g 1a/b, 4: 12 wks

Tx naive cirrhotics g 1a/b, 4: 12 wks

Tx experienced compensated cirrhotics g 1a/b, 4

1,2, 4, 5, 6

Can be used in ESRD on HD

A Few Important Points

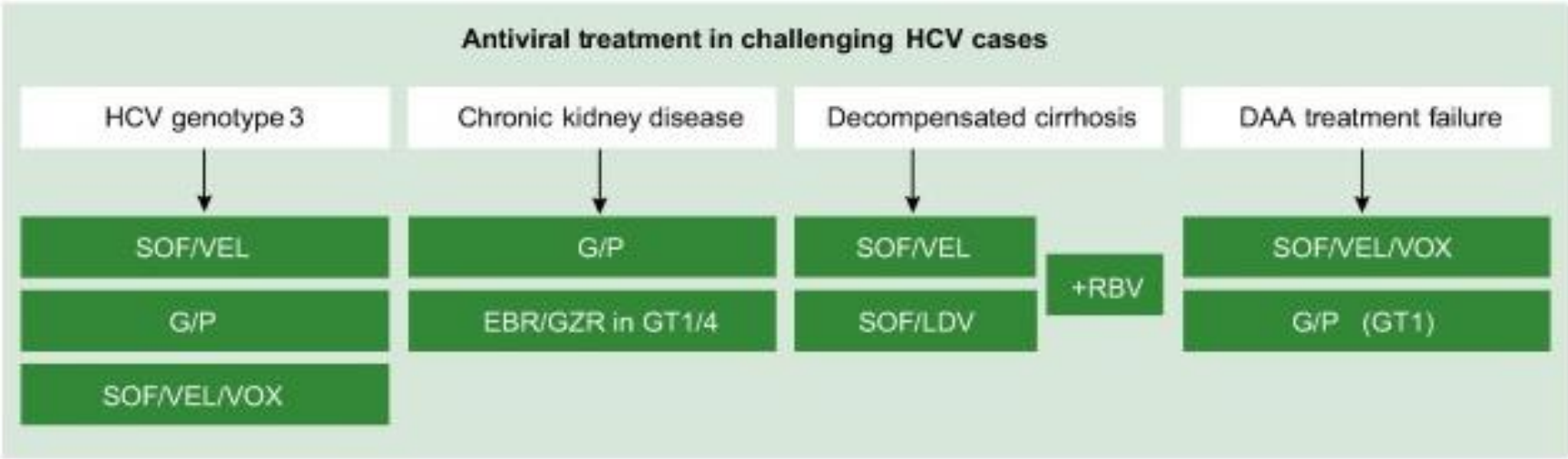
- Do not use Sofosbuvir in Cr Cl <30 or with Amiodarone
- All DAAs interact with statins except Sofosbuvir
- Do not use any protease inhibitors (--navirs) in cirrhotics
- Prevent reactivation of Hep B in those who are s Ag positive who will need steroids or B cell depleting chemotherapy or immunosuppression (for some that are also c Ab+ s Ag - depending on the therapy)

Drug Drug Interactions with DAAs---PPIs and H2 Blockers

	GLE/PIB	EBR/GZR	SOF/LDV	SOF/VEL
Antacids	No interaction	No interaction	Separate by 4 hrs	Separate by 4 hrs
H_2 blockers	No interaction	No interaction	Together or 12 hrs apart; famotidine 40 mg BID	Together or 12 hrs apart; famotidine 40 mg BID
PPIs	No interaction	No interaction	Together with omeprazole 20 mg	With food, 4 hrs before omeprazole 20 mg

PPI, proton pump inhibitor.

Considerations in Challenging HCV Cases



All First Line Treatment Options Lead to Sustained response rates ≥ 95%

HCV genotype	No Cirrhosis		Compensated Cirrhosis	
1	EBR/GZR* GLE/PIB LDV/SOF SOF/VEL	12 W 8 W 8 or 12 W 12 W	EBR/GZR* GLE/PIB** LDV/SOF SOF/VEL	12 W 12 W 12 W 12 W
2/3	GLE/PIB SOF/VEL	8 W 12 W	GLE/PIB SOF/VEL	12 W 12 W
4	EBR/GZR GLE/PIB LDV/SOF SOF/VEL	12 W 8 W 12 W 12 W	EBR/GZR GLE/PIB LDV/SOF SOF/VE	12 W 12 W 12 W 12 W
5/6	GLE/PIB LDV/SOF SOF/VEL	8 W 12 W 12 W	GLE/PIB LDV/SOF SOF/VEL	12 W 12 W 12 W

GLE/PIB SOF/VEL are pan-genotypic options

* No NS5a RAS. ** Recent label change: GLE/PIB approved for 8 week duration in cirrhosis

Fibroscan

Non-invasive measurement of hepatic fibrosis and hepatic steatosis through sound waves directed in an US probe.More widely available and standard of care.

Performed bedside

2 measurements: LSM and CAP score

Can give a falsely high fibrosis score if there is an acute elevation in LFTs, so check 3 months later once LFTs (acute hepatitis) has improved

Not accurate in those who have abdominal obesity, ascites, cardiac cirrhosis or on HD/PD

Condition	KPa Suggested values for Fibrosis staging			
	F0 – F1	F2	F3	F4
NAFLD or NASH	2 - 8.5	8.5 – 9.5	9.5 – 13.5	>13.5
Alcohol Related Disease	2 - 9	9 – 12	12 – 18.5	> 18.5
Primary Biliary Cholangitis	2 - 8.5	8.5 – 10.5	10.5 – 16.5	> 16.5
Autoimmune Hepatitis	2 - 6	6 – 10.5	10.5 - 16	> 16
Hepatitis B	2 -7	7 – 9.5	9.5 – 12.5	> 12.5
Hepatitis C	2 -7	7 – 9.5	9.5 – 12.5	> 12.5
HIV / HCV coinfection	2 -7	7 – 11.5	11.5 - 14	> 14

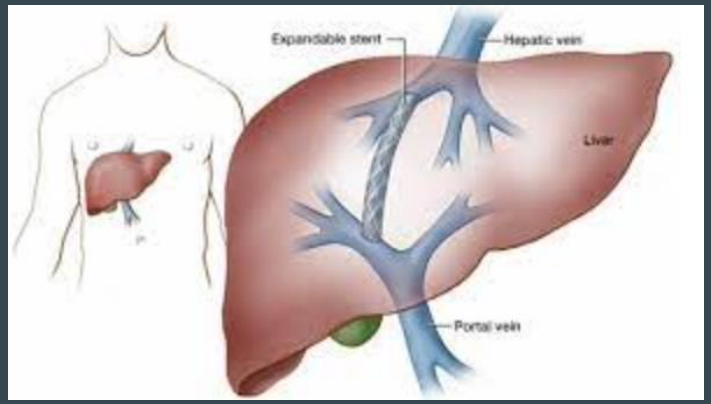
Based on > 2300 peer-reviewed publications (2020) however these are NOT absolute and should be discussed with your physician

TIPS

Indications: refractory ascites, hepatic hydrothorax and variceal bleed. Also used to preserve vasculature in hepatic/portal vein bland thrombus for transplant surgery anatomical considerations/needs. BRIDGE TO TRANSPLANT.

CI: hx of HE, TB>3 or MELD>18, tumor thrombus

Has been studied in 6 HD pts, they ended up having an irreversible hepatic encephalopathy



New NAFLD drugs

Pioglitazone (Actos)

Belfort et al. conducted an RCT of Pioglitazone (45 mg/day) in 55 patients with NASH and prediabetes or T2DM.Treatment improved insulin sensitivity and aminotransferases, steatosis, inflammation, and ballooning. The NAS improved with pioglitazone in 73% compared to 24% of placebo-treated patients ($P < 0.001$), and there was a trend toward improvement in fibrosis among patients randomized to pioglitazone.

Pioglitazone is also of benefit in patients with NASH without diabetes. Aithal et al. performed an RCT with either pioglitazone 30 mg/day or placebo for 12 months in 74 patients with NASH. Although steatosis did not improve significantly compared to placebo, treatment did significantly ameliorate hepatocellular injury and fibrosis.

Pioglitazone improves liver histology in patients with and without T2DM with biopsy-proven NASH. Therefore, it may be used to treat these patients. Risks and benefits should be discussed with each patient before starting therapy.

Until further data support its safety and efficacy, pioglitazone should not be used to treat NAFLD without biopsy-proven NASH.

Liraglutide/Semaglutide

In a recently published randomized, placebo-controlled trial consisting of 52 patients with biopsy-proven NASH, liraglutide administered subcutaneously once-daily for 48 weeks was associated with greater resolution of SH and less progression of fibrosis. As expected, liraglutide was associated with greater weight loss, but also gastrointestinal side effects.

Semaglutide

- Clinical practice
  - Strong effect on GI motility
  - GI side effects common
  - Clinical experience-up to 2 weeks before improvement of GI symptoms after cessation

NSBB in variceal bleed prophylaxis

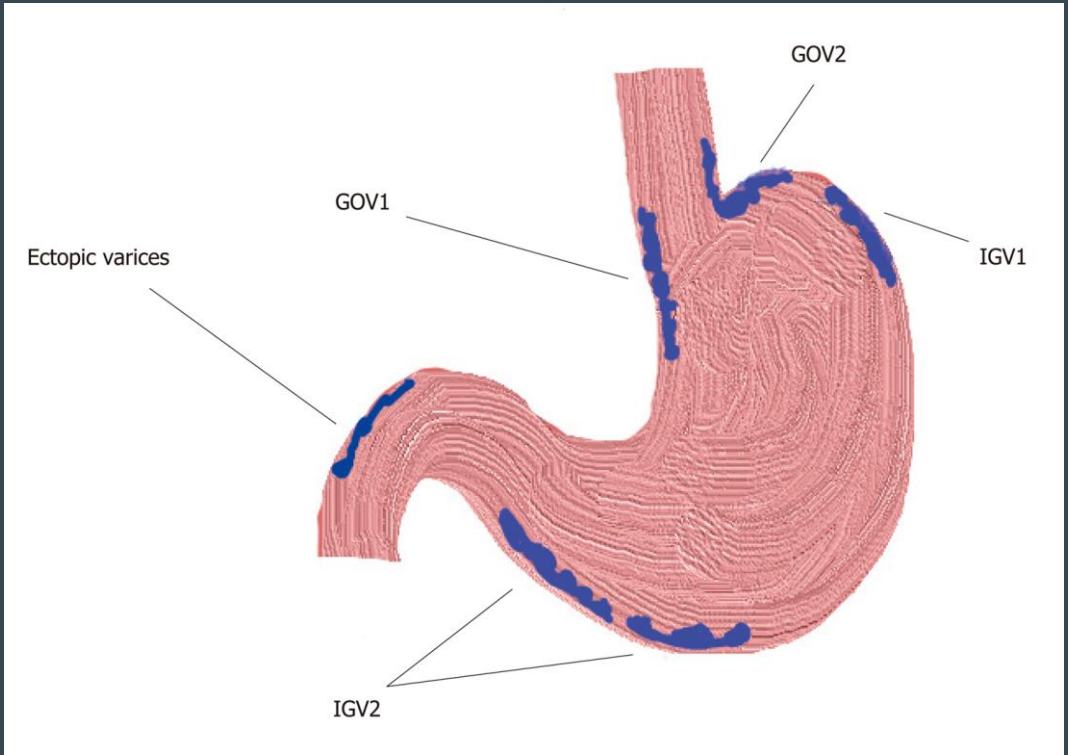
Use in primary prophylaxis, and for non bleeding varices with high risk stigmata.

Use in secondary prophylaxis with EVL.

New Baveno VII guidelines suggest no surveillance EGD in those on NSBB titrated to HR 55-60 and SBP

Avoid MAP<65 mm Hg and AKI. Can hold in acute decompensation and then resume as soon as decompensating event resolves.

Can also be used for PHG related bleeding prophylaxis and gastric variceal bleed prophylaxis. Although GOV1 should be treated like esophageal varices. The other gastric varices types respond best to EUS with coil/gel foam or EUS with cyanoacrylate glue sclerosant (however, this is only available in limited centers in the US) and hence TIPs can be placed for refractory gastric variceal bleeding.


GOV2
GOV1
IGV1
Ectopic varices
IGV2

PBC drugs: Ocaliva (Obeticholic Acid/OCA)

Do not use in those with severe pruritus as it worsens this, also can not be used in cirrhotics.

Currently, obeticholic acid (OCA; NCT02548351) and elafibranor (NCT02704403) are two compounds that are being tested in phase 3 registration trials.

OCA, a potent farnesoid X receptor agonist, administered at a 25-mg/day dose improved steatohepatitis and fibrosis over a 72-week period in a large, multicenter, phase 2b clinical trial. In this study, OCA was associated with dyslipidemia and itching.

This compound was recently approved by the FDA for treating patients with primary biliary cirrhosis who are unresponsive to UDCA therapy in a dose up to 10 mg/day.

PBC drugs: Ursodiol

Dosed 13-15 mg/kg QD

Higher doses shown to have no benefit

No benefit in PSC

MELD 3.0

This new MELD score accounts for Female gender and Creatinine.

Useful in those centers where MELD is in mid-20s for listing for transplant (to move pts up in priority) and less useful in centers where transplants are only done at MELD >30.

Innovations in Advanced Endoscopy

AI in Endo

Colonoscopy	Classification of polyps (neoplastic vs hyperplastic) * ; CADx
	Detection of malignancy within polyps (depth of invasion on endocytoscopic images) *
	Presence of mucosal inflammation on endocytoscopic images *
	Assessment of disease activity in inflammatory bowel disease *
	Assessment of quality metrics in colonoscopy

Current AI systems

Table 2 **Artificial intelligence system country approval.**

Artificial intelligence system	Country
GI-Genius (Medtronic)	European Union, Australia, Israel, South Arabia
CAD-Eye (Fuji)	European Union
Discovery (Pentax)	European Union
Endobrain-EYE (Olympus)	Japan
Wision-AI	China

Table 3 *In vivo* randomized control trials characteristics.

Ref.	Country	CAD system	CAD system aim	Number of patients		ADR (%)	ADR (%)
				WL	CAD	WL	CAD
Wang *et al*[15], 2019	China	EndoScreener	Detection	536	522	20.3	28.9
Wang *et al*[54], 2020	China	EndoScreener	Detection	478	484	28	34.1
Gong *et al*[30], 2020	China	ENDOANGEL	Quality	318	324	8	16
Repici *et al*[31], 2020	Italy	GI-Genius	Detection	344	341	40.4	54.8
Liu *et al*[28], 2020	China	Henan Xuanweitang Medical Information technology Co. Ltd.	Detection	518	508	23.9	39.2
Su *et al*[29], 2020	China	-	Detection; quality	315	308	16.5	28.9

WL: White light (control group); CAD: Computer aided diagnosis; ADR: Adenoma detection rate.

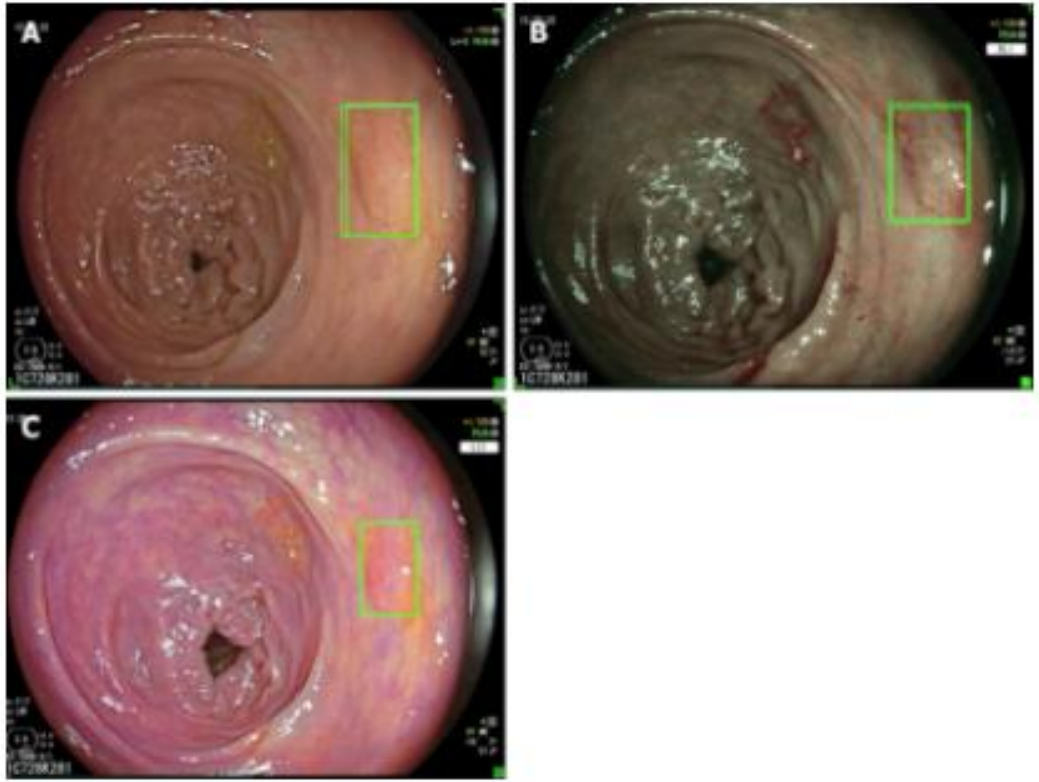


Figure 2 GI-Genius computer aided polyp detection system in high definition white light, and virtual chromoendoscopy with blue light imaging and linked color imaging. A: High definition white light; B: Virtual chromoendoscopy with blue light imaging; C: Virtual chromoendoscopy with linked color imaging.

AI Colonoscopy

Adenoma detection rate (ADR), defined as the proportion of patients in which at least one adenoma is detected (> 30% in men and 20% in women), along with adequate bowel preparation rate (> 85% of all colonoscopies), cecal intubation rate (> 95% in screening colonoscopies) and withdrawal time > 6 min, have been identified as quality metrics in screening and diagnostic colonoscopies, to reduce the I-CRC incidence. Increase in ADR by 1% has shown to decrease the risk of incidence of CRC by 3%.

Artificial Intelligence (AI)—also known as computer-aided detection (CADe)—has been shown to increase ADR and adenoma per colonoscopy (APC) by 30% and 46% in a recent randomised trial (AID-1) in expert endoscopists.

Cold Snare Polypectomy

- In this study, CSP was not associated with any postpolypectomy adverse events. CSP appears to be safer than HSP for removing 10–20 mm-sized sessile polyps. A prospective multicenter study has been commenced to verify these findings and to assess the efficacy of CSP for the complete resection of polyps of this size.

EUS portal pressure measurements and fibrosis testing/liver bx

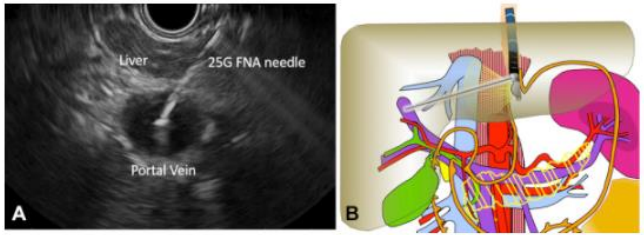


Figure 2 **A,** EUS image of transgastric transhepatic needle puncture into the portal vein with a 25-gauge FNA needle. **B,** Representation of EUS-guided transgastric portal vein puncture.

View Large Image | Figure Viewer | Download Hi-res image | Download (PPT)

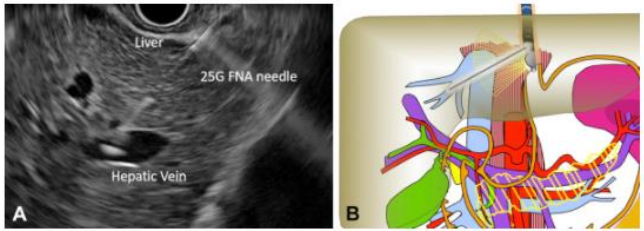
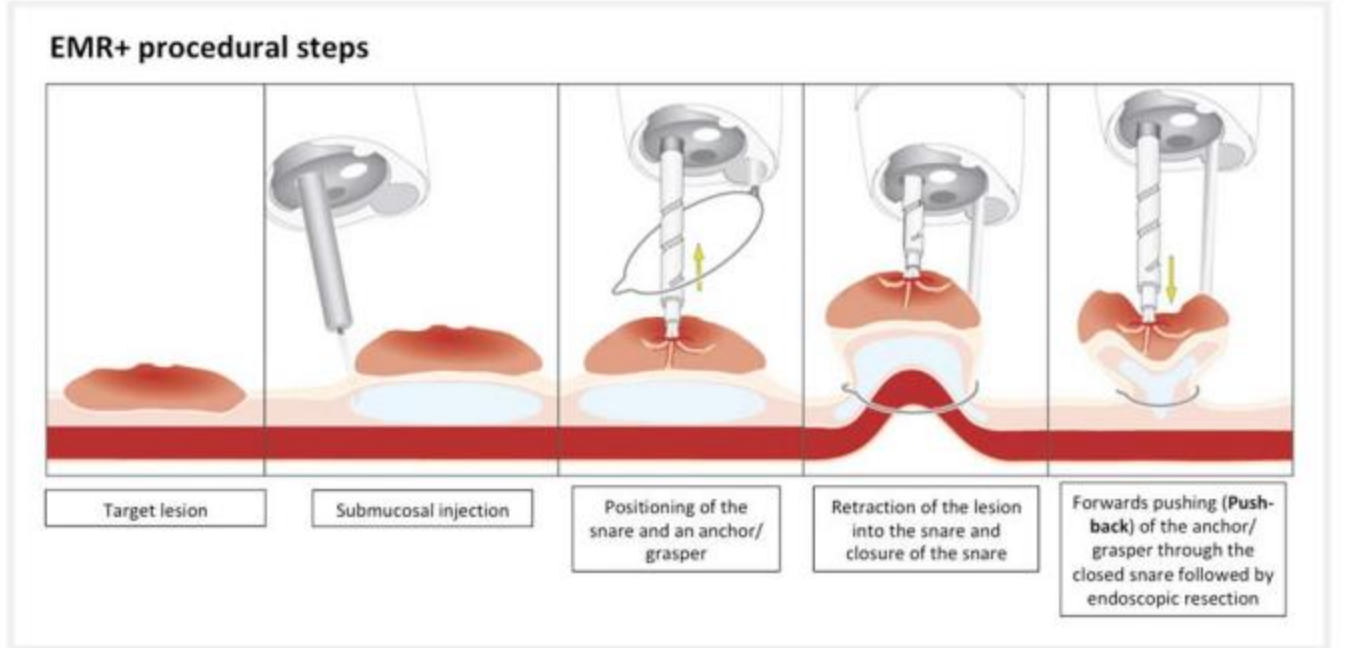


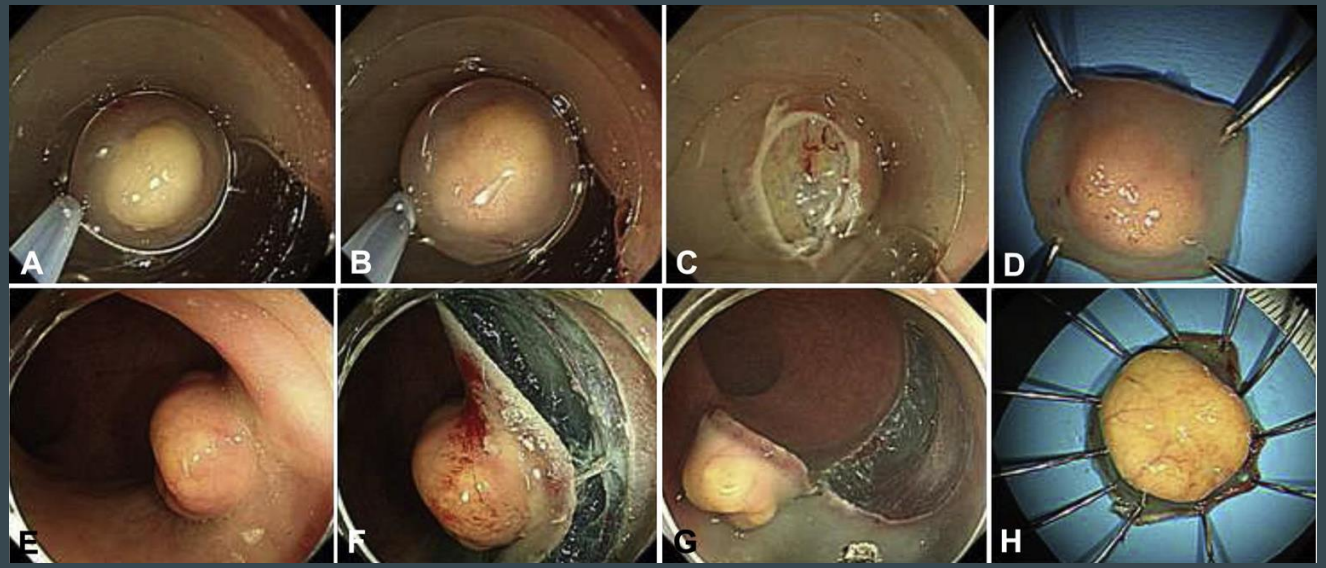
Figure 3 **A,** EUS image of transgastric transhepatic needle puncture into the hepatic vein with a 25-gauge FNA needle. **B,** Representation of EUS-guided transgastric hepatic vein puncture.

View Large Image | Figure Viewer | Download Hi-res image | Download (PPT)

EMR



► **Fig. 2** Procedural steps of endoscopic mucosal resection (EMR) with the additional working channel (EMR +). Source: Ovesco Endoscopy AG, Tübingen


A
B
C
D
E
F
G
H

ESD

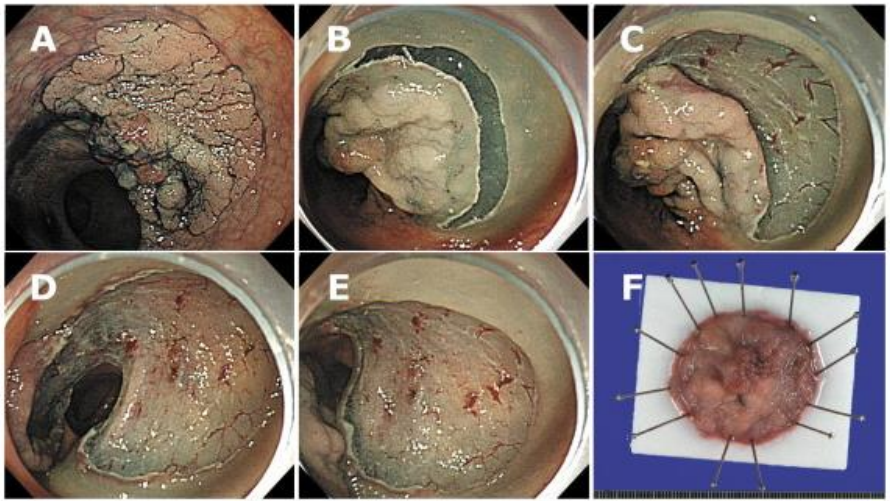


Figure 1 Endoscopic submucosal dissection (ESD) of a colorectal neoplasm. **A**, A laterally spreading tumor approximately 4 × 4 cm was identified. **B**, We performed a submucosal injection and a mucosal incision. **C**, Submucosal dissection was done. **D**, Complete submucosal dissection was almost finished. **E**, A clear, post-ESD ulcer was created. **F**, The specimen was resected en bloc.

Can be used in esophageal, gastric or colonic tumors, large or poorly differentiated polyps.

EMR vs. ESD

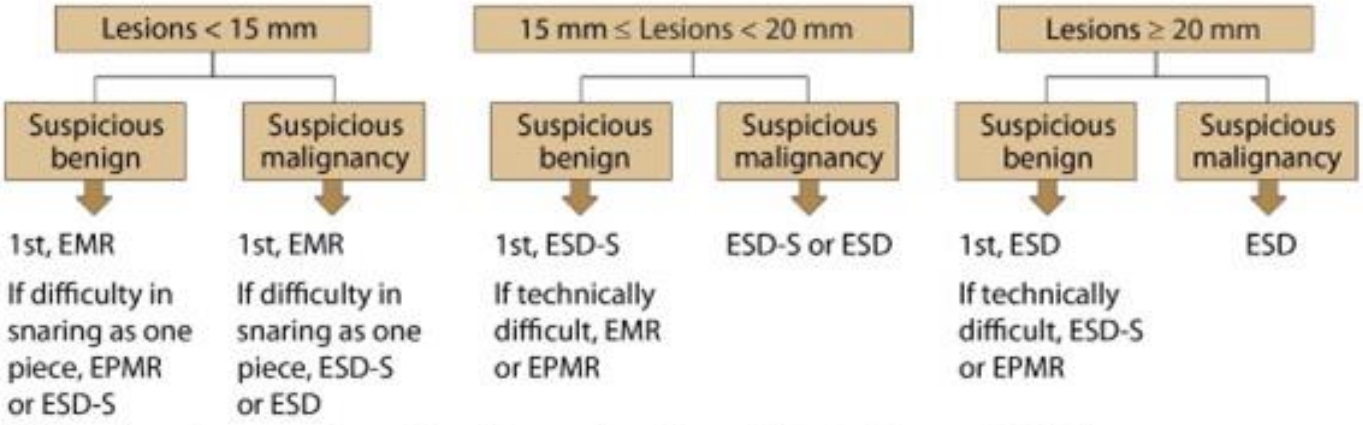
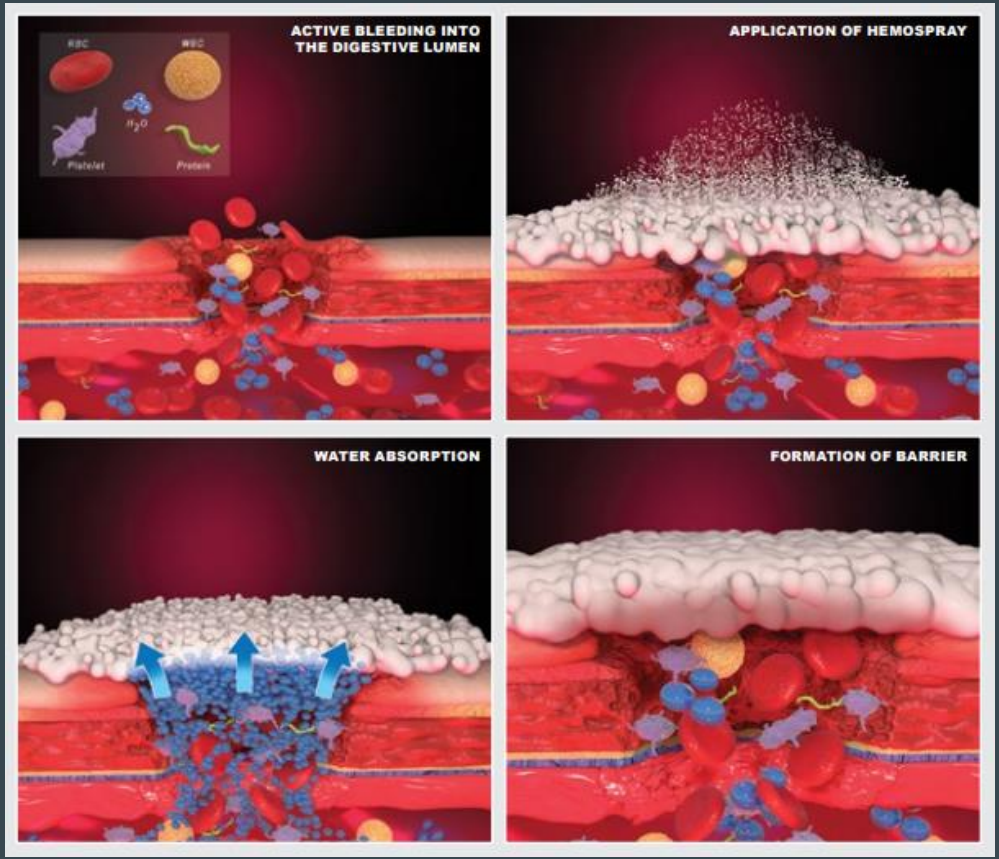


Figure 4 A strategic approach for endoscopic resection of nonpedunculated colorectal neoplasms.

Hemospray

- Control of bleeding
- Mineral powder-delivery can be challenging-needs “dry” environment
- Higher success rate with bleeding associated with malignancy

Hemospray


ACTIVE BLEEDING INTO THE DIGESTIVE LUMEN
RBC
WBC
H_2O
Platelet
Protein
APPLICATION OF HEMOSPRAY
WATER ABSORPTION
FORMATION OF BARRIER

Esophageal Stents for Esophageal Varices

- Esophageal variceal hemorrhage is responsible for 70% of all upper gastrointestinal bleeding presentations in patients with portal hypertension secondary to liver cirrhosis.
- currently, the combination of basic resuscitation, vasoactive drugs, antibiotics and endoscopic band ligation are accepted as the optimal management for patients with acute variceal bleeding.[2] However, despite these therapies, the 6-week mortality rate due to variceal bleeding is extremely high at 20%.

- Traditionally, SEMS have been used for a variety of benign and malignant esophageal disorders.

- Recently, a specially designed removable covered SEMS (SX-Ella stent Danis; Ella-CS, Hradec Kralove, Czech Republic) for the treatment of esophageal variceal hemorrhage has become available. This nitinol stent is 135 mm in length and 25mm in diameter, and achieves hemostasis by direct compression of esophageal varices. The stent can be deployed in the lower esophagus over a guidewire without any radiological assistance as the delivery apparatus has a built-in gastric balloon, which is used to guide stent placement. The endoscope is re-inserted after stent placement to confirm its position and efficacy in achieving hemostasis. Retrieval of the stent is recommended within 7 days to avoid development of pressure induced ulceration of the esophageal wall. After stent placement, oral intake and hence nutrition can be maintained, which can allow sufficient time for improvement in liver function and ultimately the opportunity to bridge to a more durable therapy (TIPS, orthotopic liver transplant).

Esophageal Stents for Esophageal Varices

A total of 5 studies have reported on the use of the SX-Ella stent Danis as salvage therapy for patients with ongoing variceal bleeding

Published series using SX-Ella stent Danis for esophageal variceal hemorrhage

	Year	Number of patients	SEMS successfully deployed (%)	Immediate hemostasis (%)	Rebleeding (%)	SEMS migration (%)	Median (range) days to stent removal	Esophageal ulcers present (%)	Mortality follow-up period
Hubmann *et al.*[9]	2006	15	100	100	0	13	5 (1-14)	5	20% 60 days
Zehetner *et al.*[10]	2008	34*	100	100	0	18	5** (1-14)	3	29% 60 days
Wright *et al.*[13]	2010	10	90	70	14	NR	9 (6-14)	10	50% 42 days
Dechêne *et al.*[14]	2012	8	100	100	38	0	11 (7-14)	0	75% 60 days
Holster *et al.*[12]	2013	5	100	100	20	20	11 (6-214)	0	40% 180 days
Zakaria[11]	2013	16	94	88	0	38	NR (2-4)	6	25% NR

SEMS: Self-expandable metallic stents, NR: Not reported, *This study is a continuation study of Hubmann *et al.*, **The 5 is a mean not a median

Esophageal Stents for Esophageal Varices

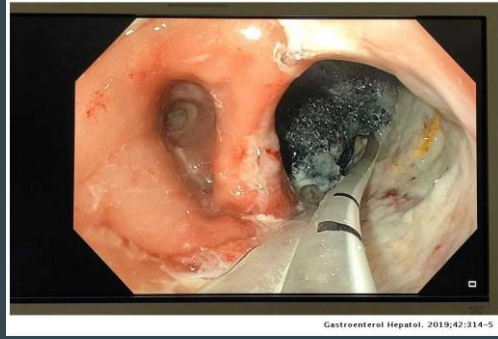
- Endoscopic band ligation is the treatment of choice for patients with acute esophageal variceal hemorrhage due to its wide availability, efficacy, safety and ease of use.

- SEMS; however, appear to be more effective, easier to insert and likely associated with a lower risk of complications compared to balloon tamponade in the treatment of patients with refractory bleeding.

- Larger studies with long-term follow-up are needed to further study efficacy, safety, and re-bleeding rates of such an approach.

- For the time being, SEMS should be primarily considered as salvage therapy when endoscopic band ligation and sclerotherapy fail. To investigate this further, a UK-based multicenter randomized trial comparing SEMS and standard endoscopic therapy in acute esophageal variceal bleeding is currently underway.

Endo sponge for anastomotic leaks



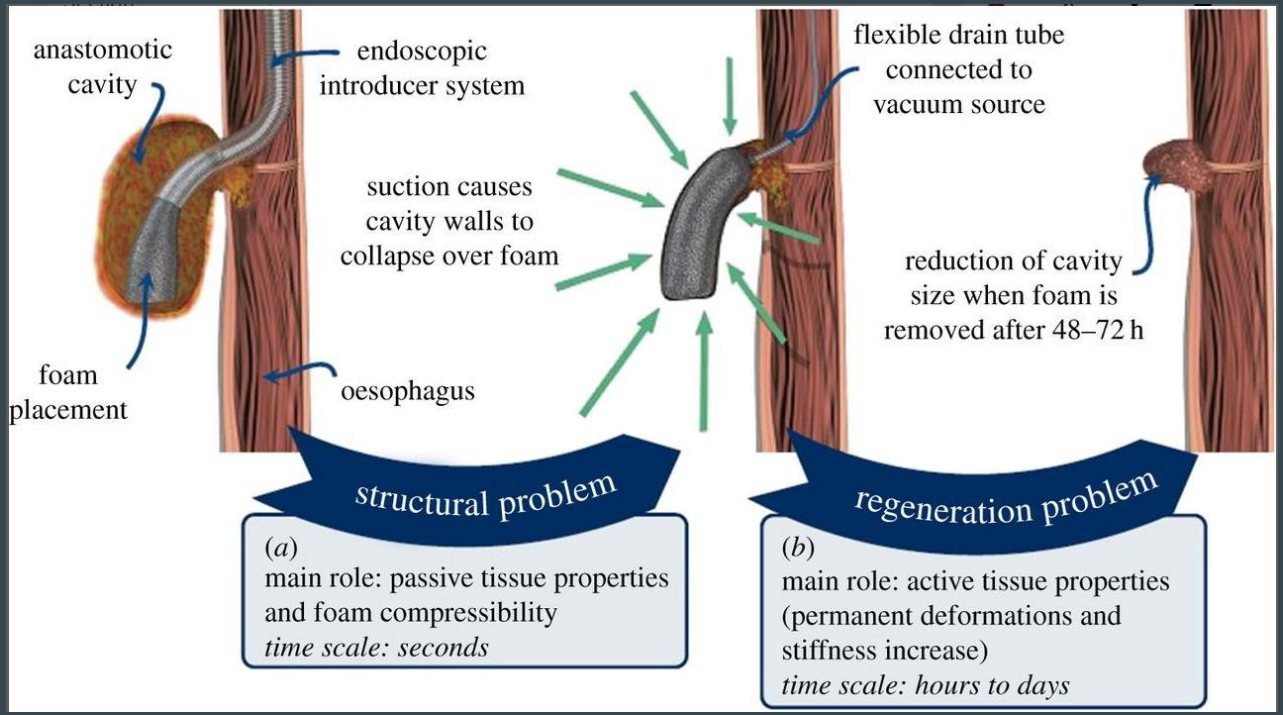
Minimally invasive method for the treatment of anastomotic leakage in the colorectal area

Indications:

- Anastomotic leak following colo-rectal surgery with anastomosis in the area of the lower pelvic area (extraperitoneal position)
- Hartmann's stump leak in the area of the lower pelvic area (extraperitoneal position)

Endo-SPONGE® seems to be a useful method of rectal anastomotic leak treatment in selected group of patients; however, the quality of available data is poor and it is impossible to draw a final conclusion. There is unexpected high rate of permanent ileostomy. There is a need for further assessment of this therapy with well-designed randomised or cohort studies.

Endo sponge for Esophageal Leaks

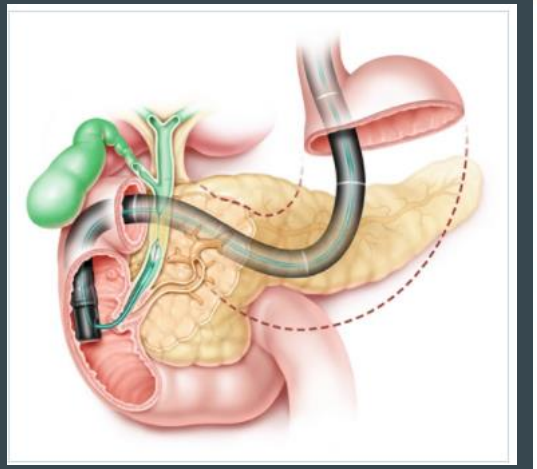


Spyglass

Attaches to ERCP scope.

Can be used to biopsy strictures/masses with SpyBite.

Can be used for laser or hydraulic lithotripsy for large stones.



Disposable Duodenoscopes

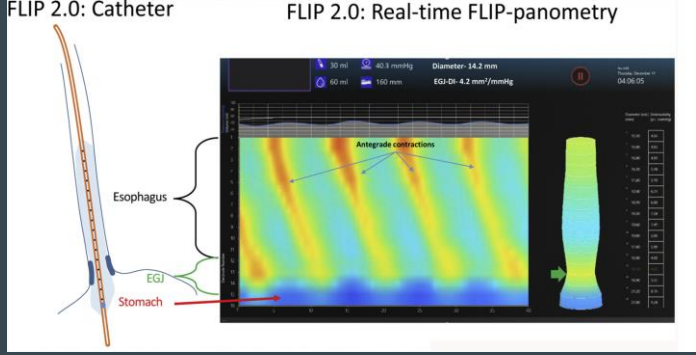
The EXALT Model D Single-Use Duodenoscope is intended to provide visualization and access to the upper gastrointestinal (GI) tract to treat bile duct disorders and other upper GI problems.

Unlike duodenoscopes that are used on multiple patients, a fully disposable duodenoscope doesn't need to be reprocessed, eliminating the risk of potential infection due to ineffective reprocessing.

Duodenoscopes are complex medical devices with many small working parts that can be difficult to clean. The device can trap contaminated tissue or fluid in its crevices and, if not thoroughly cleaned and disinfected, it can transmit infection-causing bacteria between patients.

The EXALT Model D Single-Use Duodenoscope is intended for use on a single patient, therefore removing the potential risks associated with ineffective reprocessing.

EndoFLIP



Measures the pressure and area across the organ (Esophagus).

This is done during an upper endoscopy where after the endoscopic exam is completed, a balloon catheter with sensors is passed into the esophagus and held in place. The balloon is then distended with different amount of water and the distensibility index (DI) as well as esophageal contraction are measured.

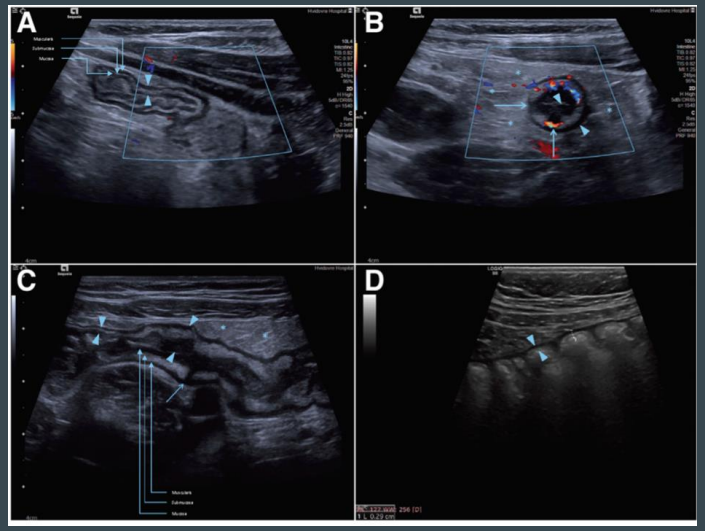
This is useful in patients being considered for reflux surgery, dysphagia, achalasia and other suspected esophageal motility disorders.

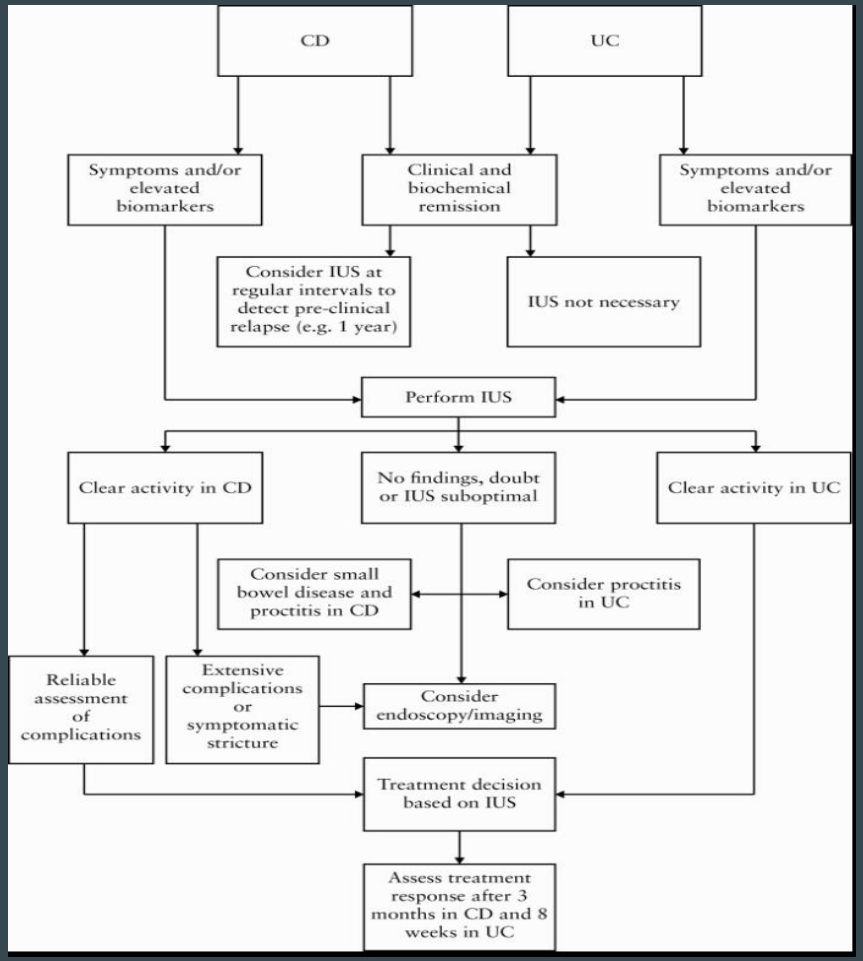
Further interest in impedance measurement to diagnose EoE without biopsies using EndoFLIP is under study.

Point of care intestinal ultrasound (POC-IUS)

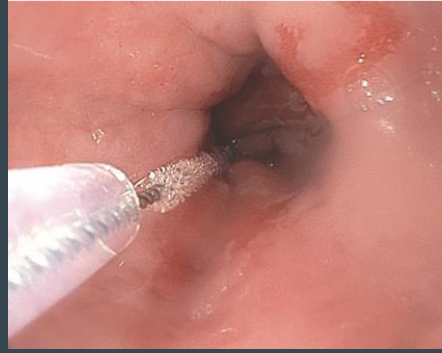
- Present inflammation on IUS was comparable between symptomatic and asymptomatic CD [67.6% vs 60.5%; p = 0.291].
- In 60%, IUS had impact on disease management with change in medication in 47.8%.
- Additional endoscopy/magnetic resonance imaging [MRI] was planned after 32.8% examinations, showing good correlation with IUS in 86.3% [ρ = 0.70, p <0.0001] and 80.0% [ρ = 0.75, p <0.0001] of cases, respectively.
- Fecal calprotectin was higher in active versus inactive disease on IUS [664 µg/g vs 79 µg/g; p <0.001].
- Over the years, IUS was performed more frequently to monitor treatment response and the use of MRI was reduced within the cohort.

Proposed use of POC-IUS





WATS 3D for Barrett's Esophagus



The standard of care still remains 4 quadrant biopsies.

WATS can be used in addition to the biopsies to increase sampling yield.

Computer Imaging system

The bristles are more rigid so they are able to get into the layers of lamina propria unlike a regular soft bristle brush (used in bile ducts and for candida esophagitis).

The brush can be used over up to a 6 cm segment and is brushed up and down and clockwise. The brush is then rolled over a slide and cut off into a formalin jar.

The advantage of WATS 3D is preservation of the 3D nature of the cells and increased the amount of cells as well as glandular architecture for pathologists to review.

There is a lot of intraobserver variability with the forceps biopsies.

There is a risk of micro capillary bleeding with the brush due to the depth of brushing.

Serrated Polyposis Syndrome (SPS)

Formerly hyperplastic polyposis syndrome

Serrated polyps have a saw-tooth appearance; the only way to determine the type of polyp is under a microscope

Diagnosed at a similar rate in men and women from 50-60s YO

Various studies have suggested that SPS can be inherited, but the inheritance pattern is unknown.

Approximately 40% of first-degree relatives of people with SPS had polyps found on screening colonoscopy. First-degree relatives should be offered colonoscopy to start at one of the following times, whichever is the soonest: the age of the earliest diagnosis of SPS in the family; at age 40; or 10 years earlier than a diagnosis of colorectal cancer in an SPS family member.

Colonoscopy should be repeated every five years if no polyps are found. If proximal serrated polyps or multiple adenomatous polyps are found, consider colonoscopy every 1 to 3 years.

Serrated Polyposis Syndrome (SPS)

WHO criteria for diagnosis of SPS:

1. The presence of 20 or more serrated polyps located anywhere in the colon
2. The presence of 5 or more serrated polyps proximal to the sigmoid colon, at least two greater than 1 cm in size
3. The presence of any serrated polyp in the colon in a patient with a family history of SPS

There is no cure for SPS. The treatment is colonoscopy and removal of polyps greater than 5 mm. This should be followed up with a colonoscopy every 1 to 3 years, depending on the number and size of polyps. Clearing of all polyps is preferable.

If the polyps cannot be safely or completely removed, or if a cancer is found, surgery is recommended. The usual approach to a colon cancer is to remove the entire colon and reconnect the small bowel to the rectum. The entire colon and rectum is at risk to developing these polyps and cancer. Therefore, any remaining colon or rectum still needs to be evaluated by endoscopy every year.

45 is the new 50: Colorectal Cancer Screening

U.S. Preventive Services TASK FORCE

The USPSTF expanded the recommended ages for colorectal cancer screening to 45 to 75 years (previously, it was 50 to 75 years). The USPSTF continues to recommend selectively screening adults aged 76 to 85 years for colorectal cancer.

This change was implemented in May 2021.

Colorectal cancer is the third leading cause of cancer death for both men and women, with an estimated 52,980 persons in the US projected to die of colorectal cancer in 2021.

Colorectal cancer is most frequently diagnosed among persons aged 65 to 74 years.

It is estimated that 10.5% of new colorectal cancer cases occur in persons younger than 50 years.

Incidence of colorectal cancer (specifically adenocarcinoma) in adults aged 40 to 49 years has increased by almost 15% from 2000-2002 to 2014-2016.

In 2016, 25.6% of eligible adults in the US had never been screened for colorectal cancers and in 2018, 31.2% were not up to date with screening.

Changing the screening age to 45 is associated with a moderate net benefit in addition to the substantial net benefit of screening at 50-75 and the small net benefit screening ages 76 to 85.

45 is the new 50: Colorectal Cancer Screening

U.S. Preventive Services TASK FORCE

Screen all adults aged 45 to 75 years for colorectal cancer. Several recommended screening tests are available. Clinicians and patients may consider a variety of factors in deciding which test may be best for each person. For example, the tests require different frequencies of screening, location of screening (home or office), methods of screening (stool-based or direct visualization), preprocedure bowel preparation, anesthesia or sedation during the test, and follow-up procedures for abnormal findings. Recommended screening strategies include:

- High-sensitivity guaiac fecal occult blood test (HSgFOBT) or fecal immunochemical test (FIT) every year
- Stool DNA-FIT every 1 to 3 years
- Computed tomography colonography every 5 years
- Flexible sigmoidoscopy every 5 years
- Flexible sigmoidoscopy every 10 years + annual FIT
- Colonoscopy screening every 10 years

Selectively screen adults aged 76 to 85 years for colorectal cancer.

Discuss together with patients the decision to screen, taking into consideration the patient's overall health status (life expectancy, comorbid conditions), prior screening history, and preferences.

Questions

Question 1

A 63-year-old woman undergoes cancer chemotherapy for lymphoma that includes rituximab and prednisone. Four weeks after her initial round of treatment, she develops jaundice, encephalopathy and coagulopathy and ultimately dies. Pretreatment screening and prophylaxis for which medical problem may have prevented this complication?

Prior HAV exposure

Prior HBV exposure

Prior HCV exposure

UGT1A1 genotype

History of prior Drug Induced Liver Injury

Question 2

A 74-year-old man presents with hematemesis. He is known to have alcoholic cirrhosis Child Turcot Pugh B. He had two esophageal bands placed a year ago for primary prophylaxis. He failed to follow up until this admission. An EGD shows a gastric fundic varix GOV2 with a red wale but no active bleeding.

What is the next best step in the management of this patient?

Perform band ligation

Administer IV antibiotics and vasoactive drugs

Initiate beta-blockade

Place TIPS

Refer for liver transplantation

Question 3

A 21-year-old woman has a history of IBS-C. She has been taking polyethylene glycol (PEG) 34 grams a day for the past few months with good effect, but she wishes to switch to another medication as she doesn't like the taste of PEG. She has bothersome abdominal cramping and bloating which did not improve with stopping PEG.

Which of the following medications do you recommend?

Insoluble fiber

Linaclotide

Lubiprostone

Senna

Eluxadoline

Question 4

A 25-year-old female with a history of ileocolonic Crohn's disease with perianal phenotype presents for clinic follow up. She recently learned she is six weeks pregnant and wants to discuss her Crohn's management during pregnancy. Her Crohn's disease was initially diagnosed at age 16 years when she presented with recurrent perianal abscesses. Evaluation confirmed perianal fistula as well as luminal Crohn's disease involving the rectum and ileocecal region. She was treated initially with a prednisone taper and then placed on infliximab monotherapy with good response. However, four years later, she developed recurrent symptoms and was found to have high anti-infliximab antibodies with no detectable drug level. At that time, she was placed on combination therapy with adalimumab and azathioprine, which she has maintained until now. Clinically, she feels well with no diarrhea or rectal bleeding. She continues to have intermittent drainage from the perianal fistula that she manages with short courses of antibiotics, the last three months ago.

Which of the following is the most appropriate medical management for this patient during pregnancy?

Intermittent use of ciprofloxacin for perianal fistula symptoms

Continue both adalimumab and azathioprine during pregnancy

Stop azathiprine and continue adalimumab monotherapy

Stop adalimumab and continue azathioprine during pregnancy

Vaginal delivery is preferred over C-section in this patient

Question 5

A 22-year-old male with a two-year history of left- sided ulcerative colitis has been unable to taper off oral corticosteroids. In your discussions with him on initiation of a corticosteroid-sparing agent, you discuss the risks and benefits of vedolizumab, an anti-integrin therapy. Which of the following adverse events have been associated with vedolizumab use?

Increased serious infection risk

Psoriasiform skin lesions

Progressive multi-focal leukoencephalopathy

Increased risk of lymphoproliferative disorder

No important differences in common adverse events

References

Aithal GP, Thomas JA, Kaye PV, Lawson A, Ryder SD, Spendlove I, Austin AS, Freeman JG, Morgan L, Webber J. Randomized, placebo-controlled trial of pioglitazone in nondiabetic subjects with nonalcoholic steatohepatitis. Gastroenterology. 2008 Oct;135(4):1176-84. doi: 10.1053/j.gastro.2008.06.047. Epub 2008 Jun 25. PMID: 18718471.

Amitiza. Takeda Pharmaceuticals. https://www.takeda.com/en-us/newsroom/news-releases/2008/amitiza-lubiprostone-8-mcg-now-available-to-treat-irritable-bowel-syndrome-with-constipation-in-adult-women/

Attardo S, Chandrasekar VT, Spadaccini M, Maselli R, Patel HK, Desai M, Capogreco A, Badalamenti M, Galtieri PA, Pellegatta G, Fugazza A, Carrara S, Anderloni A, Occhipinti P, Hassan C, Sharma P, Repici A. Artificial intelligence technologies for the detection of colorectal lesions: The future is now. *World J Gastroenterol* 2020; 26(37): 5606-5616 [PMID: 33088155 DOI: 10.3748/wjg.v26.i37.5606]

Belfort R, Harrison SA, Brown K, Darland C, Finch J, Hardies J, Balas B, Gastaldelli A, Tio F, Pulcini J, Berria R, Ma JZ, Dwivedi S, Havranek R, Fincke C, DeFronzo R, Bannayan GA, Schenker S, Cusi K. A placebo-controlled trial of pioglitazone in subjects with nonalcoholic steatohepatitis. N Engl J Med. 2006 Nov 30;355(22):2297-307. doi: 10.1056/NEJMoa060326. PMID: 17135584.

Byeon JS, Yang DH, Kim KJ, Ye BD, Myung SJ, Yang SK, Kim JH. Endoscopic submucosal dissection with or without snaring for colorectal neoplasms. Gastrointest Endosc. 2011 Nov;74(5):1075-83. doi: 10.1016/j.gie.2011.03.1248. Epub 2011 Jun 12. PMID: 21663905.

Cimzia. UCB Inc. Smyrna. GA. https://www.cimzia.com

Comellas Ester, et al. On the feasibility of the computational modelling of the endoluminal vacuum-assisted closure of an oesophageal anastomotic leakage *R. Soc. open sci. 2018.* 5171289171289

DDSEP9. May 2019. Questions and Chapters: Viral Hepatitis, Metabolic Diseases of the Liver, Diarrhea and Constipation, GI Motility, IBD.

Dieterich DT. A Simplified Algorithm for the Management of Hepatitis C Infection. *Gastroenterol Hepatol (N Y).* 2019;15(5 Suppl 3):1-12.

References

EndoFLIP https://www.uofmhealth.org/conditions-treatments/digestive-and-liver-health/endoflip

EndoSponge. Braun. https://www.bbraun.co.uk/en/products/b0/endo-sponge.html
https://www.elsevier.es/en-revista-gastroenterologia-hepatologia-english-edition--382-articulo-endoluminal-endoscopic-therapy-with-endo-sponge-S2444382419300987

Entecavir. https://www.mayoclinic.org/drugs-supplements/entecavir-oral-route/side-effects/drg-20063656?p=1

Enterra II. Medtronic. https://www.medtronic.com/us-en/patients/treatments-therapies/neurostimulator-gastroparesis/enterra-2-neurostimulator.html

Exalt. Boston Scientific. https://www.bostonscientific.com/en-US/medical-specialties/gastroenterology/exalt/clinical.html

FDA 2019 Press Release: FDA clears first fully disposable duodenoscope, eliminating the potential for infections caused by ineffective reprocessing. https://www.fda.gov/news-events/press-announcements/fda-clears-first-fully-disposable-duodenoscope-eliminating-potential-infections-caused-ineffective

Huang JY, Samarasena JB, Tsujino T, Lee J, Hu KQ, McLaren CE, Chen WP, Chang KJ. EUS-guided portal pressure gradient measurement with a simple novel device: a human pilot study. Gastrointest Endosc. 2017 May;85(5):996-1001. doi: 10.1016/j.gie.2016.09.026. Epub 2016 Sep 29. PMID: 27693644; PMCID: PMC5611853.

Humira. AbbVie. North Chicago, IL. https://www.humira.com

References

Ibsrela. Ardelyx. https://www.ibsrela-hcp.com/efficacy/?gclid=Cj0KCQjwgYSTBhDKARIsAB8KukulDrGetuxXIAx2uCNqvqQ_n2FIW2Gx_UsbSQ_PlQ4i0hCftFoOEeYaAhMkEALw_wcB&gclsrc=aw.ds

Infliximab. Micromedex 2022. https://www.mayoclinic.org/drugs-supplements/infliximab-intravenous-route/description/drg-20068387

Kim WR, Mannalithara A, Heimbach JK, Kamath PS, Asrani SK, Biggins SW, Wood NL, Gentry SE, Kwong AJ. MELD 3.0: The Model for End-Stage Liver Disease Updated for the Modern Era. Gastroenterology. 2021 Dec;161(6):1887-1895.e4. doi: 10.1053/j.gastro.2021.08.050. Epub 2021 Sep 3. PMID: 34481845; PMCID: PMC8608337.

Kumbhari V, Saxena P, Khashab MA. Self-expandable metallic stents for bleeding esophageal varices. Saudi J Gastroenterol. 2013 Jul-Aug;19(4):141-3. doi: 10.4103/1319-3767.114503. PMID: 23828742; PMCID: PMC3745654.

Lichtenstein, Gary R MD, FACG1; Loftus, Edward V MD, FACG2; Isaacs, Kim L MD, PhD, FACG3; Regueiro, Miguel D MD, FACG4; Gerson, Lauren B MD, MSc, MACG (GRADE Methodologist)5,†; Sands, Bruce E MD, MS, FACG6. ACG Clinical Guideline: Management of Crohn's Disease in Adults. American Journal of Gastroenterology: April 2018 - Volume 113 - Issue 4 - p 481-517

Lin S, Lau LH, Chanchlani N*, et al*Recent advances in clinical practice: management of inflammatory bowel disease during the COVID-19 pandemic *Gut* 2022;**71:**1426-1439. https://www.gimotirx.com/the-gimoti-difference?gclid=CjwKCAjwvNaYBhA3EiwACgndgiawSHedn41UT7rfcoxEQXWbkCHkFdJa_3Qs-uH6MdZYEuR8zJI7hBoCJFIQAvD_BwE

Linaclotide. AbbVie. https://www.rxabbvie.com/pdf/linzess_pi.pdf

Natalizumab. Biogen. 2022. https://www.tysabri.com

Ocaliva. Intercept. https://ocalivahcp.com/moa/

O'Neil PM, Birkenfeld AL, McGowan B, Mosenzon O, Pedersen SD, Wharton S, Carson CG, Jepsen CH, Kabisch M, Wilding JPH. Efficacy and safety of semaglutide compared with liraglutide and placebo for weight loss in patients with obesity: a randomised, double-blind, placebo and active controlled, dose-ranging, phase 2 trial. Lancet. 2018 Aug 25;392(10148):637-649. doi: 10.1016/S0140-6736(18)31773-2. Epub 2018 Aug 16. PMID: 30122305.

References

Poupon RE, Poupon R, Balkau B. Ursodiol for the long-term treatment of primary biliary cirrhosis. The UDCA-PBC Study Group. N Engl J Med. 1994 May 12;330(19):1342-7. doi: 10.1056/NEJM199405123301903. PMID: 8152446.

Prucalopride. Takeda Pharmaceuticals. https://www.motegrityhcp.com/mechanism-of-action

Rifaximin. Salix Pharmaceuticals. https://www.xifaxan.com/about-xifaxan-ibsd/

Rinvoq. AbbVie. North Chicago, Illinois. https://www.rinvoqhcp.com/?cid=ppc_ppd_rinvoq_hcp_ggl_brnd_17322&gclid=Cj0KCQjwgYSTBhDKARIsAB8KuktcDXmGJOb3zAUdQaTguNAKZEiJ44V3ApkB9rfZwIUofD0lalcvEd8aAgWDEALw_wcB&gclsrc=aw.ds

Rubin, David T. MD, FACG1; Ananthakrishnan, Ashwin N. MD, MPH2; Siegel, Corey A. MD, MS3; Sauer, Bryan G. MD, MSc (Clin Res), FACG (GRADE Methodologist)4; Long, Millie D. MD, MPH, FACG5. ACG Clinical Guideline: Ulcerative Colitis in Adults. The American Journal of Gastroenterology: March 2019 - Volume 114 - Issue 3 - p 384-413

Serrated Polyposis Syndrome. Cleveland Clinic. 2018. https://my.clevelandclinic.org/health/diseases/17462-serrated-polyposis-syndromehyperplastic-polyposis-syndrome

Shen B, Kochhar G, Navaneethan U, Farraye FA, Schwartz DA, Iacucci M, Bernstein CN, Dryden G, Cross R, Bruining DH, Kobayashi T, Lukas M, Shergill A, Bortlik M, Lan N, Lukas M, Tang SJ, Kotze PG, Kiran RP, Dulai PS, El-Hachem S, Coelho-Prabhu N, Thakkar S, Mao R, Chen G, Zhang S, Suárez BG, Lama YG, Silverberg MS, Sandborn WJ. Practical guidelines on endoscopic treatment for Crohn's disease strictures: a consensus statement from the Global Interventional Inflammatory Bowel Disease Group. Lancet Gastroenterol Hepatol. 2020 Apr;5(4):393-405. doi: 10.1016/S2468-1253(19)30366-8. Epub 2020 Jan 16.

Simponi. Janssen Biotech. 2020. https://www.simponi.com

Smith, M. he Role of Brush Biopsy in the Management of Barretts Esophagus. Gastro and Hep. 2016. 12 (11).

SpyGlass. Boston Scientific. https://www.bostonscientific.com/en-US/products/single-use-scopes/spyglass-ds-direct-visualization-system/clinical-data.html

Spyglass™ Direct Visualization System to Cure ERCP Addiction. MedGadget. 2007. https://www.medgadget.com/2007/05/spyglass_direct_visualization_system_makes_ercps.html https://health.usf.edu/medicine/internalmedicine/digestive/spyglass

References

Stelara. Janssen Biotech. https://www.stelarainfo.com/crohns-disease/patient-resources

Sucraid. QOL Medical. https://www.sucraid.com

Talicia. https://www.talicia.com/patient/why-talicia/how-talicia-works/

TIPS: Integrated Liver Care. https://transplantationliver.com/tips/

Tofacitinib. Pfizer. https://labeling.pfizer.com/ShowLabeling.aspx?id=959

Trulance. Salix Pharmaceuticals. https://www.trulance.com

Using Fibroscan in the Clinic: An Interview with Dr. Stephen A. Harrison. MedGadget. Sept. 2019. https://www.medgadget.com/2019/09/using-fibroscan-in-the-clinic-interview-with-dr-stephen-a-harrison.html

USPSTF Colorectal Cancer Screening. https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/colorectal-cancer-screening

Vedolizumab. Takeda Pharmaceuticals. 2021. https://www.entyvio.com/vedolizumab

Viberzi. AbbVie. https://www.viberzi.com

WATS. https://www.cdxdiagnostics.com/wats3d

References

Wedi Edris et al. Additional working channel for EMR of pedunculated SSA . Endoscopy 2019; 51: 279–280

Wilkens R, Dolinger M, Burisch J, et al. Point-of-Care Testing and Home Testing: Pragmatic Considerations for Widespread Incorporation of Stool Tests, Serum Tests, and Intestinal Ultrasound. Gastroenterology. 2022; 162 (5): 1476-1492.

Zeposia. Bristol Myers Squibb.
https://www.zeposia.com/?&cid=sem_1414347&utm_source=google&utm_medium=cpc&utm_content=ozanimod&utm_campaign=Zeposia%20General&utm_term=ozanimod&gclid=Cj0KCQjwgYSTBhDKARIsAB8KukvCtfCDI9MTY_a54EW3FLhUFakLRDdrX98QeHEYG-UTZPtlvdW3WfgaAjpfEALw_wcB&gclsrc=aw.ds