

# 2023 SCSG LGI SYMPOSIUM





# Sprays and Injections

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# Goals

- To provide an overview of commonly available agents to assist with polyp resection and bleeding
- Chromoendoscopy
- Submucosal Injections
- Hemostatic sprays

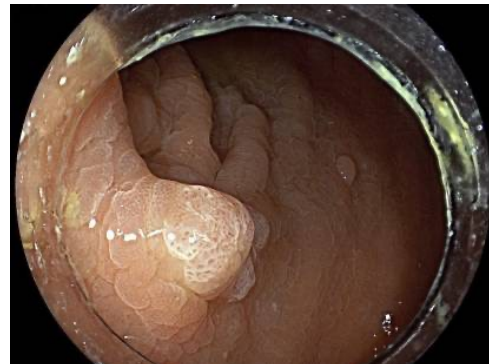
# Sprays to Aid Polyp Detection/Identification

- Methylene blue
  - Absorptive Stain
  - Preferentially stains intestinal and colonic mucosa without staining dysplastic or malignant cells
- Indigo carmine
  - Contrast stain
  - Does not stain mucosa
  - Pools in mucosal grooves and crevices to highlight surface topography.
- Acetic acid
  - Aceto-whitening – Reacts with mucosa to enhance surface patterns.
  - Increases light backscatter from nuclei
  - Particularly helpful for sessile serrated lesions

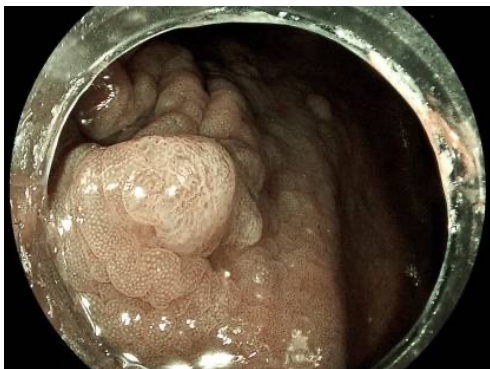
HD-  
white  
light



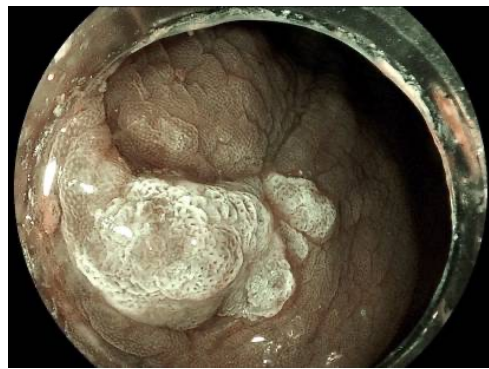
Acetic  
acid



NBI



Acetic  
acid +  
NBI



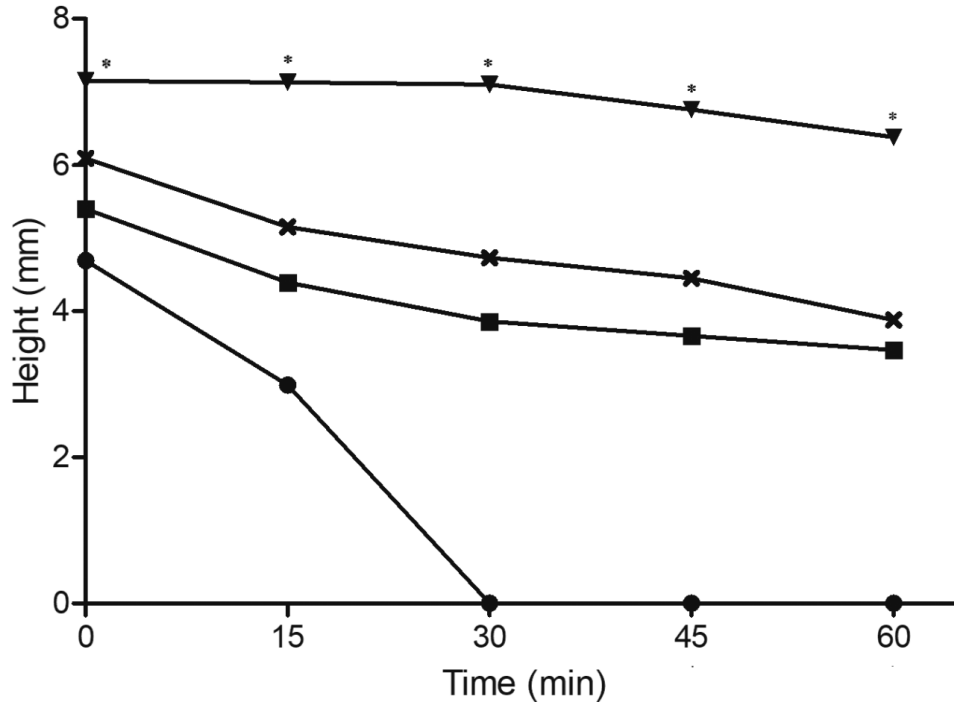
# Injections to Aid Resection

Injectant	Materials	Pre-dyed	Unit Size	Manufacturer	Cushion Duration	Cost	FDA Approved
Normal saline	0.9% NaCl	No	10 mL	Various	+	\$	No
Hydroxyethyl starch	HES	No	1L	Various	++++	\$	No
Eleview	MCT, poloxamer, hydroxystearate	Yes	5 × 10-mL ampules per kit	Medtronic	+++	\$\$\$	Yes
EndoClot SIS	Sodium carboxymethyl starch	Yes	0.5g and 1g kits	Olympus	++++	\$\$\$	
EverLift	Hydroxyethyl Cellulose	Yes	10 x 5-mL syringes	GI Supply	++++	\$\$\$	Yes

# Other Agents to Aid Resection

Injectant	Concentration/Materials	Pre-dyed	Unit Size	Manufacturer	Cushion Duration	Cost	FDA Approved	Notes
Sodium hyaluronate/hylauronic acid	0.40%	No	—	Various —	+++	\$\$\$	No	In U.S., off label use of eye drops
Hydroxypropyl methylcellulose	0.30%	No		Various	+++	\$\$\$		In U.S., off label use of eye drops
Succinylated gelatin	0.09 mg/mL methylene blue	No	10 mL	Various —	++	\$	No	Caution gelatin hypersensitivity
Dextrose	50%	No	10-mL syringe	Various	++	\$	No	Possible tissue damage, PP syndrome
Fibrinogen	1 g fibrinogen, 50 mL NS, 0.5 mL Indigo carmine, 0.5 mL 1:1000 epinephrine	Yes	—	Green Cross Corps	+++	\$\$\$	No	Possible tissue damage

# Comparative Clinical Data – Animal Studies



Changes in the mucosal elevation following injection of normal saline (NS), 3.3% sodium carboxymethyl starch (Na-CMS), sigMAVisc or Eleview solutions

P < .05 compared to NS



# Submucosal Injection Video



# Hemostatic Sprays

- Non-contact, non-thermal, atraumatic hemostatic material
- Non-specific targeting useful for:
  - Wide field
  - Difficult positions or angles
  - Difficult to localize sources
- Monotherapy or combination therapy
- Duration of action typically up to 24-72 hours

# Commercially Available Hemostatic Sprays

- Hemospray
- EndoClot Polysaccharide Hemostatic System
- Nexpowder Endoscopic Hemostasis system



# Hemostatic Sprays

Name	Key Features	Approved for
Hemospray	First to market	Nonvariceal GIB
	Inert mineral powder forms adhesive mechanical barrier	LGIB
	CO2 cartridge for delivery	
	24-72 hour adhesion	
EndoClot PHS	Absorbed Modified Polymer particles	Nonvariceal UGIB, excluding F1a
	Starch derived – breaks down to glucose	
	Absorbs water from blood to concentrate/accelerate coagulation	
	External air compressor constant flow vs pulses	
	Can be irrigated and reapplied	
Nexpowder	Non-gas delivery system	Nonvariceal UGIB
	“No-clog” powder forms blue gel	
	Adhesive mechanical barrier	
	Reacts to moisture (not just blood)	

# Hemostatic Spray Video



# Comparison of Hemospray and Endoclot

- 154 consecutive patients with GIB (137 upper, 17 lower)
  - 35% PUD
  - 15% diffuse oozing/erosions
  - 11.7% tumor bleed
  - 8.7% esophagitis
  - 7% esophageal varices
- Primary therapy – 69%
- Salvage therapy – 64%

## Comparison of Hemospray® and EndoClot® for the Treatment of Gastrointestinal Bleeding

Francesco Vitali<sup>1</sup>, Andreas Naegel<sup>1</sup>, Raja Atreya<sup>1</sup>, Steffen Zopf<sup>1</sup>, Clemens Neufert<sup>1</sup>, Juergen Siebler<sup>1</sup>, Markus F Neurath<sup>1</sup>, Timo Rath<sup>2</sup>

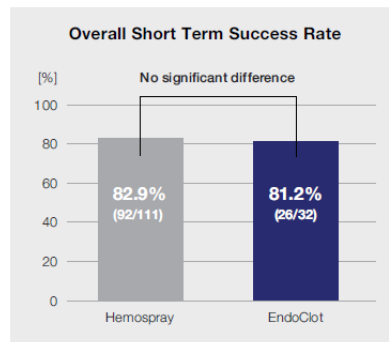
<sup>1</sup>Ludwig Demling Endoscopy Center of Excellence, Division of Gastroenterology, Friedrich-Alexander-University, Erlangen 91054, Germany.

<sup>2</sup>Ludwig Demling Endoscopy Center of Excellence, Division of Gastroenterology, Friedrich-Alexander-University, Erlangen 91054, Germany. timo.rath@uk-erlangen.de.

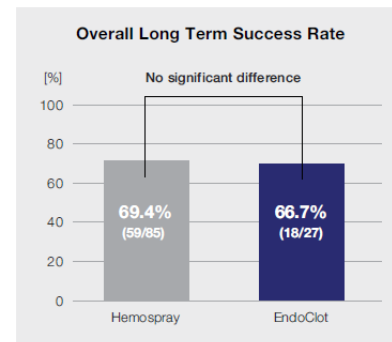
World J Gastroenterol. 2019 Apr 7;25(13):1592-1602.

### Main Outcomes

Allows for effective hemostasis with no differences in short term, long term success compared to Hemospray.



No significant difference in was observed for short term success (hemostasis for 72 h) between Hemospray and EndoClot under primary or salvage therapy.



As with short term success, there was no significant difference in long term success (hemostasis for a period of 30 days).

# Comparison of Hemospray and Endoclot

- 72-hour hemostasis = 82.5%
- 30-day hemostasis = 66%
- Overall rebleed rate 25%
  
- No significant differences between sprays



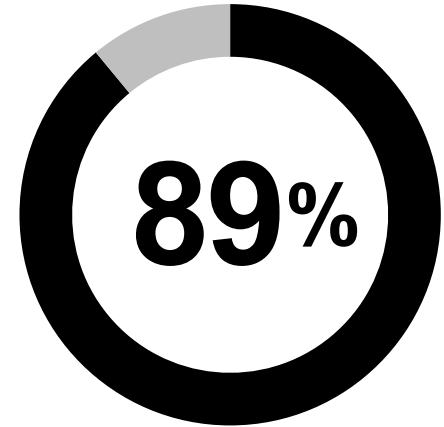
# Nexpowder Data

- Refractory UGIB (salvage therapy)
  - 94% initial hemostasis
  - 19% rebleeding at 30 days
  - Gel remained in place at 24h in 69%
- Non-variceal UGIB – 96.4% immediate hemostasis in 56 patients
  - 82.1% post endoscopic therapy bleeding
  - 14% PUD



# Hemospray Postmarket Registry Subgroup Analysis

	Monotherapy (n = 118)	Combination therapy (n = 141)	Rescue therapy (n = 55)
<b>Achieved Immediate hemostasis</b>	<b>92.4%</b> 109/118	<b>88.7%</b> 125/141	<b>85.5%</b> 47/55
<b>Predicted rebleeding rate: 25-40%</b>			
<b>Rebleeding</b>	<b>7.3%</b> 8/109	<b>9.6%</b> 12/125	<b>19.1%</b> 9/47

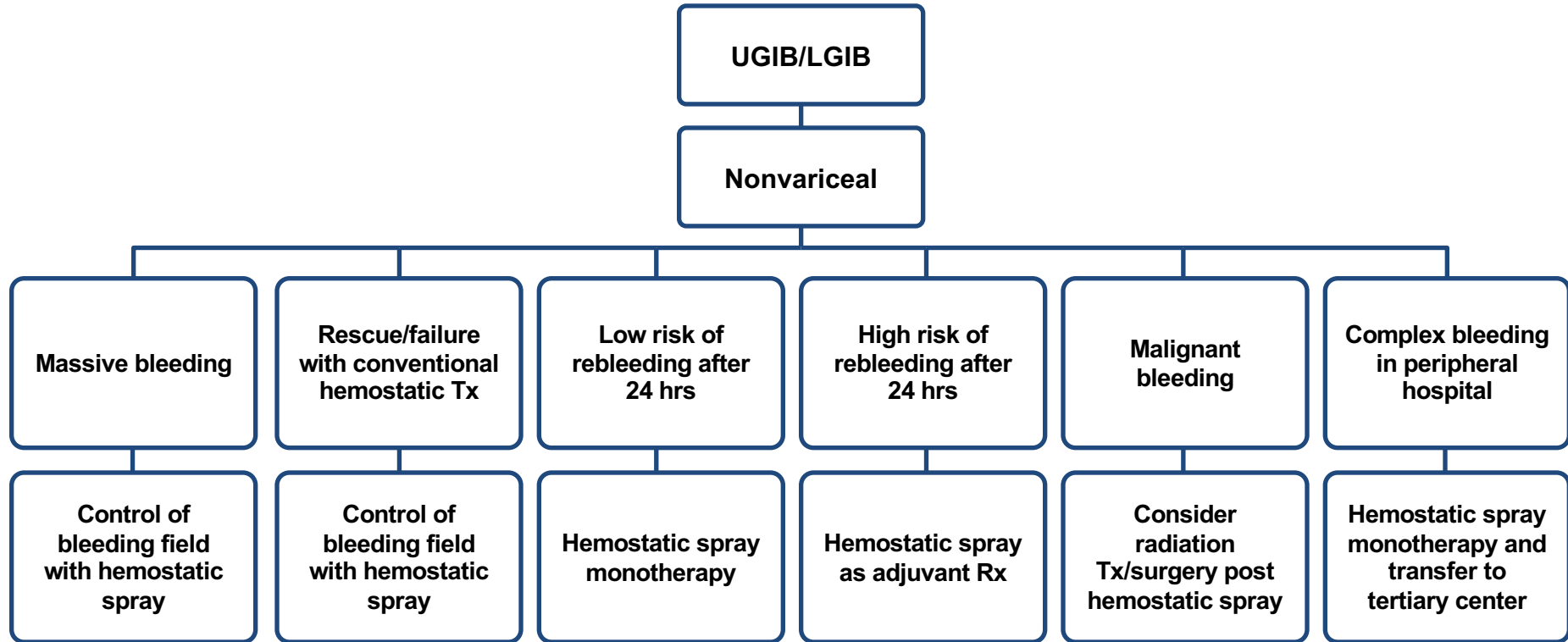


Immediate hemostasis

# Peptic Ulcer Disease Subgroup Analysis

	<b>n</b>	<b>Achieved hemostasis</b>
Monotherapy	44/167 = <b>26%</b>	38/44 = <b>86%</b>
Combination therapy	87/167 = <b>52%</b>	76/87 = <b>87%</b>
Rescue therapy	36/167 = <b>22%</b>	29/36 = <b>81%</b>
<b>Rockall 7 predicted rebleeding rate: 25-40%</b>		
Rebleeding	18/142 = <b>12.7%</b>	

# Proposed Clinical Algorithm for Hemostatic Sprays



# Summary



- Growing toolset of mucosal sprays, submucosal injections, and hemostatic sprays to aid with polyp identification, resection, and bleeding
- In my opinion, while there may be some differences between the various options, local availability, clinical volume and situation, cost, and physician preference will largely drive choice of agent

# Thank You

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