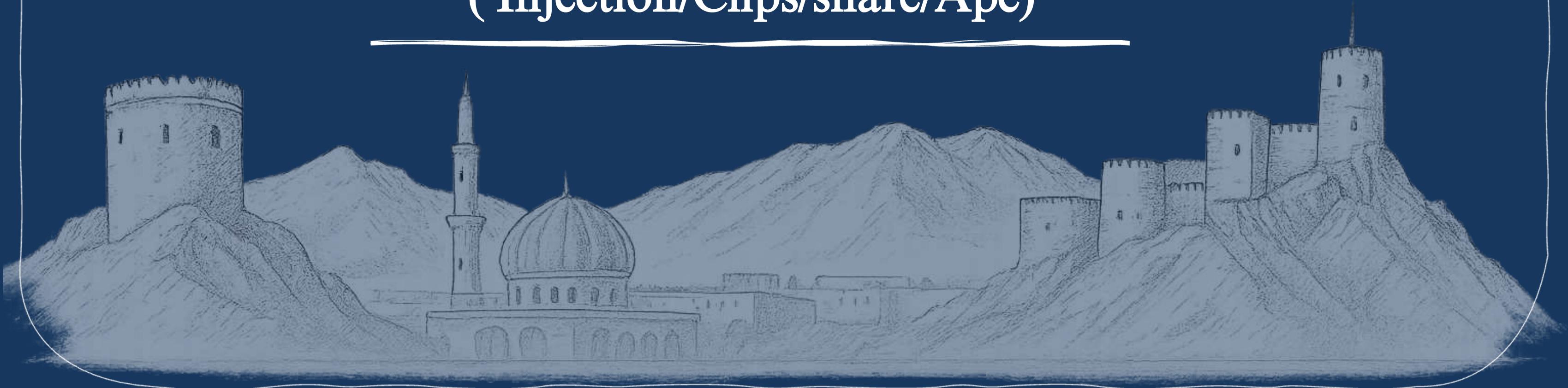


Therapeutic Assistance

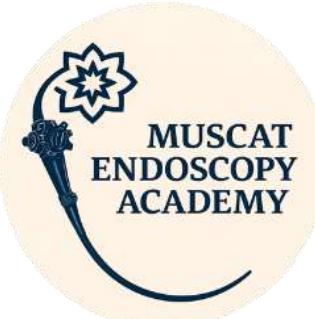
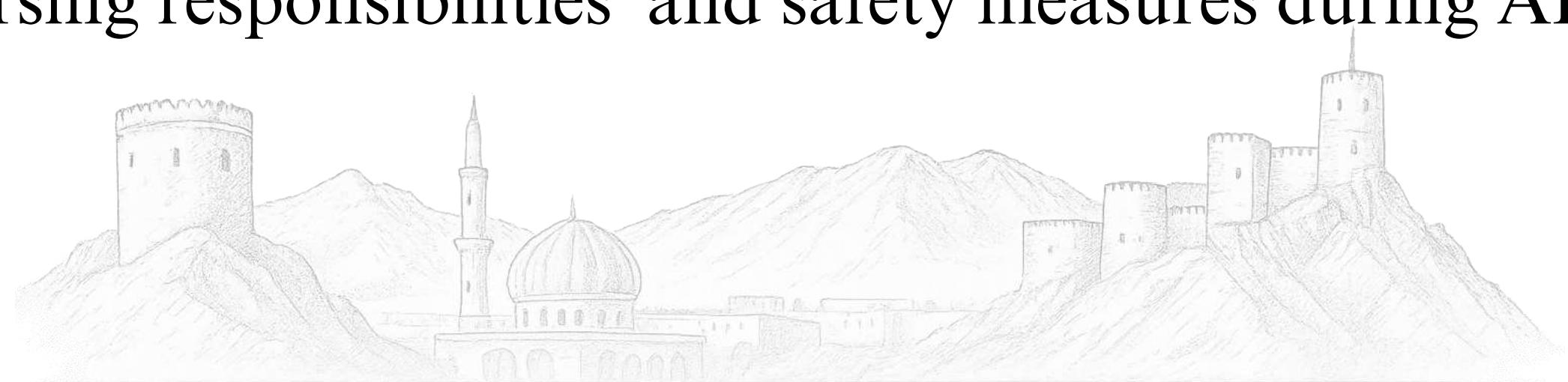
(Injection/Clips/snare/Apc)



RGN: Farazan AlBalushi
RGN: Fatmah AlAmari

Objectives:

- Identify the function and the proper use of injection needles, hemoclips, snares, and Argon Plasma Coagulation (APC) equipment.
- Demonstrate nursing role and proper role coordination between the nurse, assistant, and endoscopist during therapeutic endoscopy.
- Maintain accurate nursing documentation of therapeutic interventions including injection needles, hemoclips, snares, and Argon Plasma Coagulation (APC) equipment.
- Understand nursing responsibilities and safety measures during APC.



what makes the endoscopy nurse essential for a safe and successful procedure?



INJECTION(Adrenaline):

- Diluted epinephrine (1 mg/mL at 1:10,000) is commonly used for endoscopic injection therapy. The typical preparation is 9 mL of normal saline mixed with 1 mL of adrenaline.
- Epinephrine acts by inducing **vasoconstriction** and creating local tissue tamponade, which helps temporarily **slow or stop bleeding**.
- A meta-analysis found that endoscopic clips are more effective than injection therapy alone in achieving **hemostasis** (87% vs. 75%).
- According to current ESGE and ASGE guidelines, epinephrine should only be used as an **initial therapy**, followed by a definitive mechanical or thermal method, because its effect is **short-acting**.

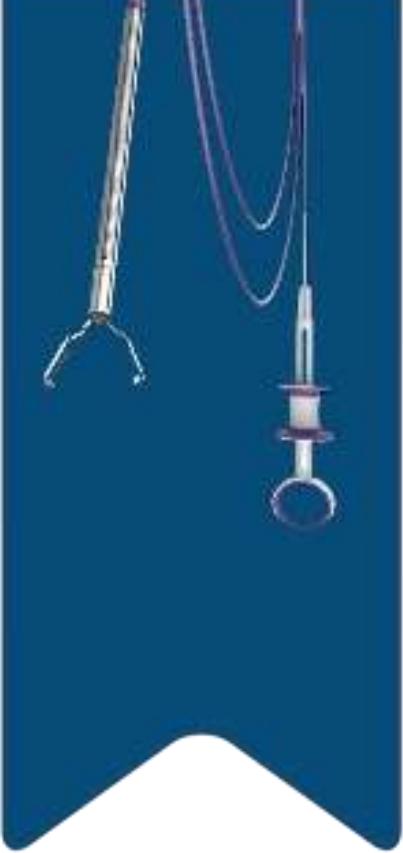


Mechanical: Hemoclip

- **Hemostatic clips (endoclips)** are metallic devices that control bleeding by **mechanically compressing a vessel or approximating tissue edges**, without causing additional tissue injury.
- They are primarily used in emergencies for: **Gastrointestinal bleeding** ,**Prevention of delayed bleeding after endoscopic resection (EMR/ESD)** and **closure of perforations**.
- Endoclips come in **multiple sizes** and are typically **rotatable**, with the ability to **open and close** repeatedly, allowing for precise and accurate placement.



Through-the-scope clip :



TTS type	Use	Disadvantage	Physical feature			Functional feature				
			Open width (mm)	Jaw length (mm)	Material	Rotatability	Overshoot/whip	Precision of open/close	Tensile strength of lateral manipulation	Strength of tissue compression
	Resolution 360	Preloaded and ready to use in spurting bleedings	11	9	Stainless steel, cobalt	+++	+++	++	++	+++
	Instinct		13, 5	9	Stainless steel, nitinol	+	+	++	++	+++
	Quick clip pro		11	10	Elgiloy	+	+	+	+++	+
	Dura clip		11	7	Stainless steel	++	++	+++	+	+
	Sure clip		14	11	Stainless steel	++	+++	+++	++	++



Over the scope clip:

OTSC type	Use	Disadvantage	Material	
	No traumatic version (with blunt teeth)		Nitinol	
	Traumatic version (with sharp teeth)	Endoscopic repair of digestive iatrogenic (postsurgical and postendoscopic resection) perforations and massive bleeding	Reloading of the OTSC system needs removal of the instrument	Nitinol
	Padlock		Nitinol	



- A multicenter randomized trial of 112 patients with peptic ulcer bleeding compared Over-the-Scope (OTS) clips with Through-the-Scope (TTS) clips as first-line mechanical therapy. The study found that 30-day rebleeding was low in both groups (OTS 1.6% vs. TTS 3.9%). Initial hemostasis was significantly higher with OTS clips (98.4% vs. 78.4%, $P = 0.001$), and overall clinical success was also superior in the OTS group (96.7% vs. 74.5%, $P = 0.001$).



Nursing Role in Endoscopic Hemostasis (Hemoclip & Epinephrine Injection)



Core Concept	Adrenaline Injection (1:10,000)	Hemoclip (Mechanical Clip)
Patient Safety	Monitor vital signs closely due to risk of tachycardia, hypertension, and arrhythmias.	Ensure the clip size and type are appropriate to avoid tissue injury and achieve secure closure.
Medication/equipment Safety	double-checking the correct dilution (1 mg in 10 mL).	Ensure the device functions properly (opening, closing, rotation).
Technical Competency	Prepare 9 mL normal saline + 1 mL adrenaline; remove air.	Know how to rotate, open, and close the clip; verify deployment readiness before inserting through the scope.



Nursing Role in Endoscopic Hemostasis (Hemoclip & Epinephrine Injection)



Infection Control	<p>Use sterile injectors and dispose of sharps safely.</p>	<p>Ensure proper reprocessing of clip deployment systems and accessories.</p>
Team Coordination	<p>Prepare the injector quickly, communicate remaining volume, and pass tools in correct sequence.</p>	<p>Coordinate clip positioning with the physician; assist with precise scope orientation.</p>
Documentation	<p>dilution, total injected volume, injection site, and bleeding response.</p>	<p>clip type, size, number applied, placement site</p>
Post-Procedure Monitoring	<p>Monitor for signs of rebleeding within 24–48 hours and watch hemodynamic stability.</p>	<p>Monitor for pain, potential perforation, and note that clips detach naturally within 1–3 weeks.</p>

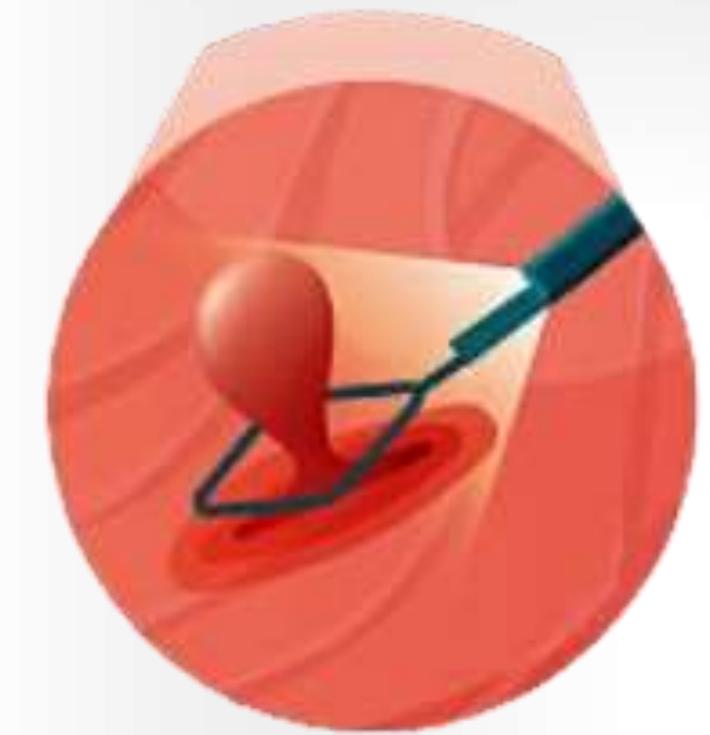
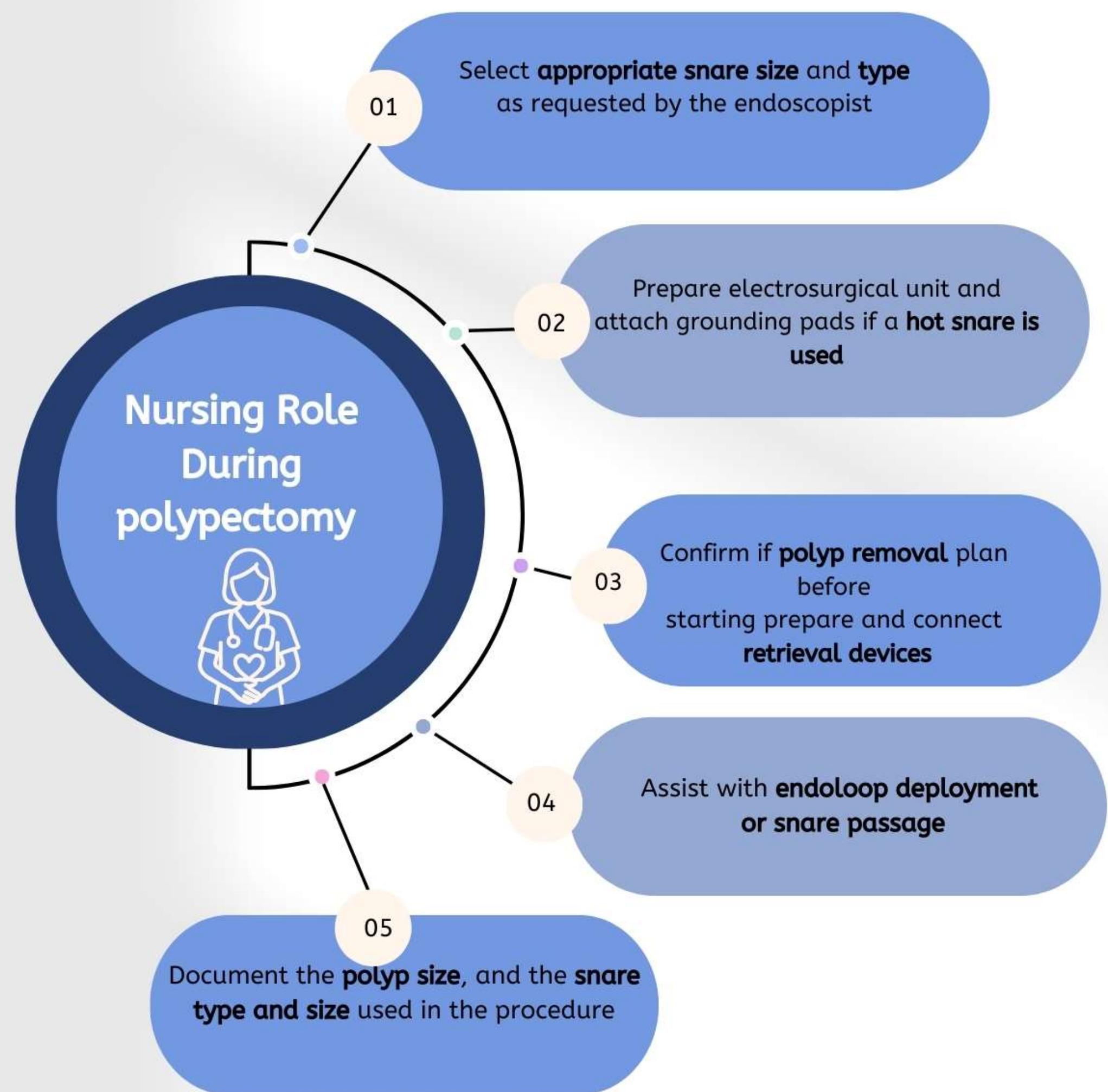


Polypectomy set up



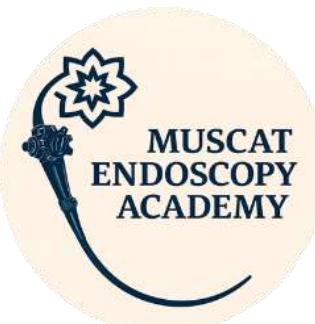
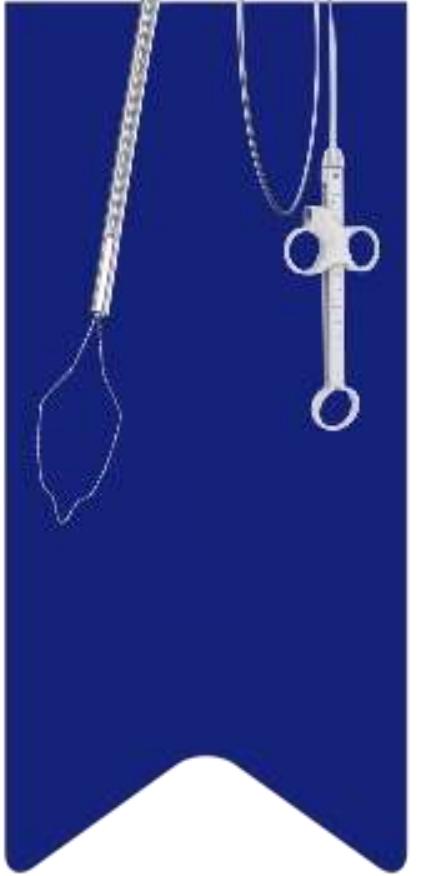
- 01 Polypectomy snares: Hot and cold
- 02 Injection needles: For submucosal lifting
- 03 Hemoclips: For hemostasis
- 04 Endoloops: For large pedunculated polyps
- 05 Coagulation devices: APC
- 06 Syringes & injectates: Saline, adrenaline
- 07 Retrieval tools: Trap, net, baskets





Cold vs Hot Polypectomy:

	Cold Polypectomy (No electrocautery)	Hot Polypectomy (With electrocautery)
Uses electrocautery	<ul style="list-style-type: none">• Uses mechanical excision only (snare or forceps).	Snare uses electrical current to cut & coagulate tissue simultaneously.
pros	Less risk of perforation and delayed bleeding.	Effective for larger polyps; reduces immediate bleeding
Cons	Less effective for larger polyps (>10 mm).	Higher risk of delayed bleeding and perforation; requires careful technique.



Role coordination between

- The nurse,
- The assistant,
- And endoscopist :



Thermal: APC

Argon Plasma Coagulation common endoscopic technique used to deliver high-frequency **electrical current** through **ionized argon gas**, producing precise heat to **Stop bleeding** Seal tissue and **Destroy** abnormal cells in the GI tract.

APC Settings:

Power:

- Standard: 30–60 W

Gas flow:

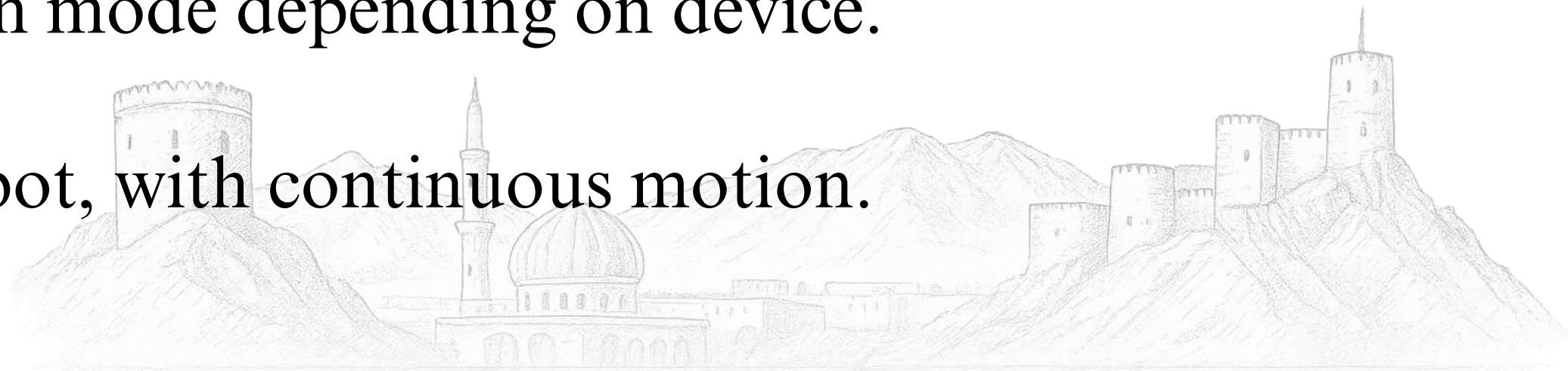
- Colon: 1–2 L/min
- Upper GI: 0.8–1.5 L/min

Mode:

- Forced/coagulation mode depending on device.

Application time:

- 1–5 seconds per spot, with continuous motion.



Thermal: APC settings

Practical Application of Argon Plasma Coagulation (APC) in GI Tract

Mode	Properties	Clinical application	Settings
Forced APC	Continuous beam with steady power output, fast and effective, large area of hemostasis; provides effective coagulation and devitalization; used for tumor debulking and coagulation of acute ulcer bleeding	Tumor ablation Tumor bleeding Dieulafoy's ulcer Stent trimming Bleeding ulcer	> 60 W, 20–50 W 30–60 W 30–60 W 30–60 W 30–60 W
Pulsed APC	Intermittent power output, more controlled effect on tissue; suitable for hemostasis of diffuse and widespread bleeding (GAVE, angiodysplasias) and for ablation Barrett's esophagus	Barrett's esophagus, residual adenomas, radiation proctitis, hemostasis stomach/colon, stent ingrowth/overgrowth	Barrett's - 30–50 W, Effect 2 Others including left colon and rectum - 10–30 W, Effect 1 or 2
Smart/precise APC	Automatic power adjustment according to distance from tissue; works in the lower energy range, suitable for treating angiodysplasias in the right colon, cecum, and small bowel	Hemostasis duodenum and right colon	Effect 4–5, 10–30 W

Thermal: APC settings

Olympus ESG-300 Electrosurgery Settings	
Intervention	ESG-300 (Olympus)
Polypectomy and Endoscopic Mucosal Resection (EMR)	
Standard polypectomy and EMR	PulseCut Slow (E2, 120 W)
Large pedunculated/rectal polyps	Forced Coag (E4, 120 W)
Right colon polypectomy	PulseCut Slow (E2, 120 W)
Margin ablation to reduce recurrence (STSC)	Soft Coag (E3, 50 W)
ERCP	
Endoscopic sphincterotomy	PulseCut Fast (E2, 120 W)
Precut papillotomy	NA
Endoscopic Submucosal Dissection (ESD)	
Lesion marking	Soft Coag (E3, 50 W)
Mucosal incision	PulseCut Fast (E2, 120 W)
Submucosal dissection	Power Coag (E2, 30 W)
Hemostasis (small vessels)	Power Coag (E2, 30 W)
Hemostasis (large vessels)	Soft Coag (E3, 50 W)
Peroral Endoscopic Myotomy (POEM)	
Mucosal incision	PulseCut Fast (E2, 120 W)
Submucosal tunneling	Spray Coag (E2, 40 W)
Myotomy	PulseCut Fast (E2, 120 W)
Hemostasis	Soft Coag (E3, 50 W)
Endoscopic Full Thickness Resection (EFTR)	
Lesion marking	Soft Coag (E3, 50 W)
Cutting	Pure Cut (E1, 120 W)

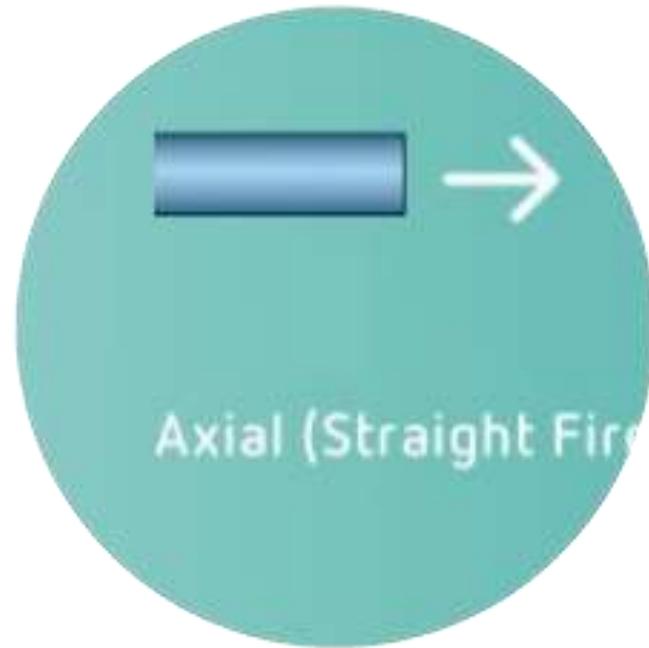
Thermal: APC Settings

ERBE VIO 200/300 Electrosurgery Settings

Intervention	VIO 200/300 (ERBE)
Polypectomy and Endoscopic Mucosal Resection (EMR)	
Standard Polypectomy and EMR	EndoCut Q (E3, D1, I 4-6)
Right colon polypectomy	EndoCut Q (E1-2, D1, I 4-6)
Large pedunculated/rectal polyps	EndoCut Q (E4, D1, I 6)
Margin ablation to reduce recurrence (STSC)	Soft Coag (E4, 80 W)
ERCP	
Endoscopic sphincterotomy	EndoCut I (E2, D3, I3)
Precut papillotomy	EndoCut I (E2, D3, I3)
Endoscopic Submucosal Dissection (ESD)	
Lesion marking	Soft Coag (E4, 50-80 W)
Mucosal incision	EndoCut I (E2, D3, I 1), DryCut (E2-3, 30 W)
Submucosal dissection	Swift Coag (E4, 30-40 W)
Hemostasis (small vessels)	Swift Coag (E4, 30-40 W)
Hemostasis (large vessels)	Soft Coag (E4-5, 60-80 W)
Peroral Endoscopic Myotomy (POEM)	
Mucosal incision	EndoCut I (E2, D2, I 2)
Submucosal tunneling	Spray Coag (E2, 50 W)
Myotomy	Spray Coag (E2, 50 W), EndoCut I (E2, D2, I 2)
Hemostasis	Soft Coag (E4-5, 60-80 W)
Endoscopic Full Thickness Resection (EFTR)	
Lesion marking	Forced Coag (E2, 20 W) or Soft Coag (E4, 80 W)
Cutting	High Cut (E4, 200 W), AutoCut (E5, 180 W)

Thermal : APC Probe Types

Straight Fire Probe



- Most commonly used type.
- Used for general coagulation, angiodyplasia, superficial bleeding, gastric antral vascular ectasia (GAVE).

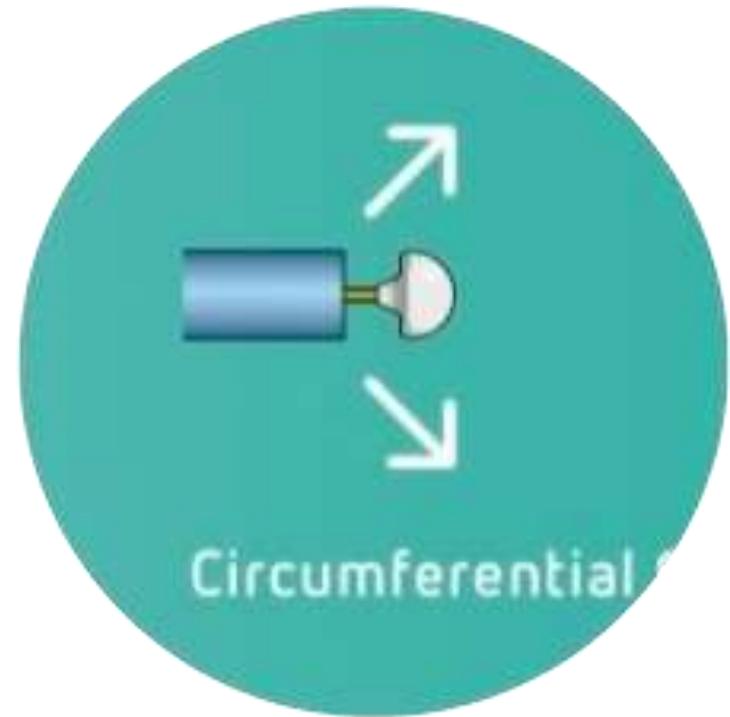
Side-Fire / Lateral APC Probe



- Emits plasma sideways, not forward.
- Used when the lesion is on a fold, angulated area, or **difficult-to-reach surface**.
- Useful in **esophagus and colon** where forward delivery is difficult..

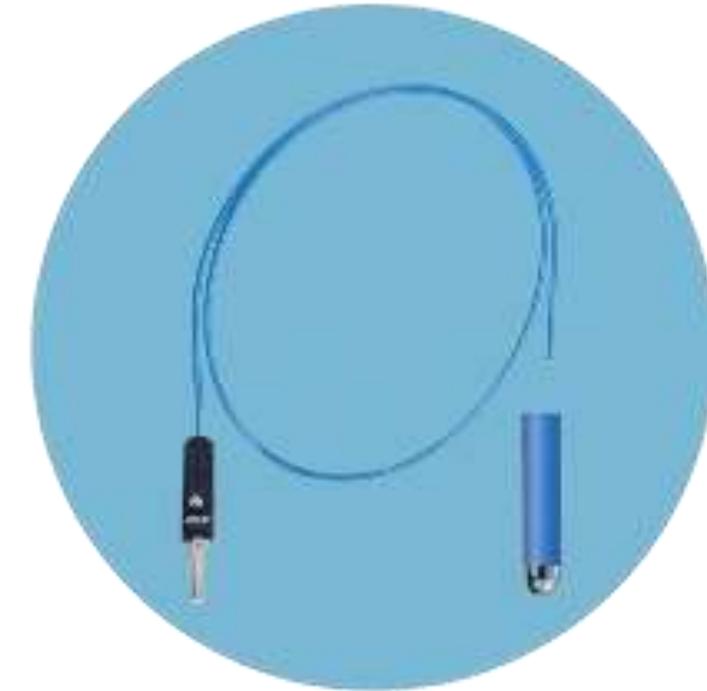
Thermal : APC Probe Types

Circumferential APC Probe



- Delivers **360° plasma**.
- Rare; used in **Barrett's esophagus** ablation in some systems.

Flexible / Soft APC Probe

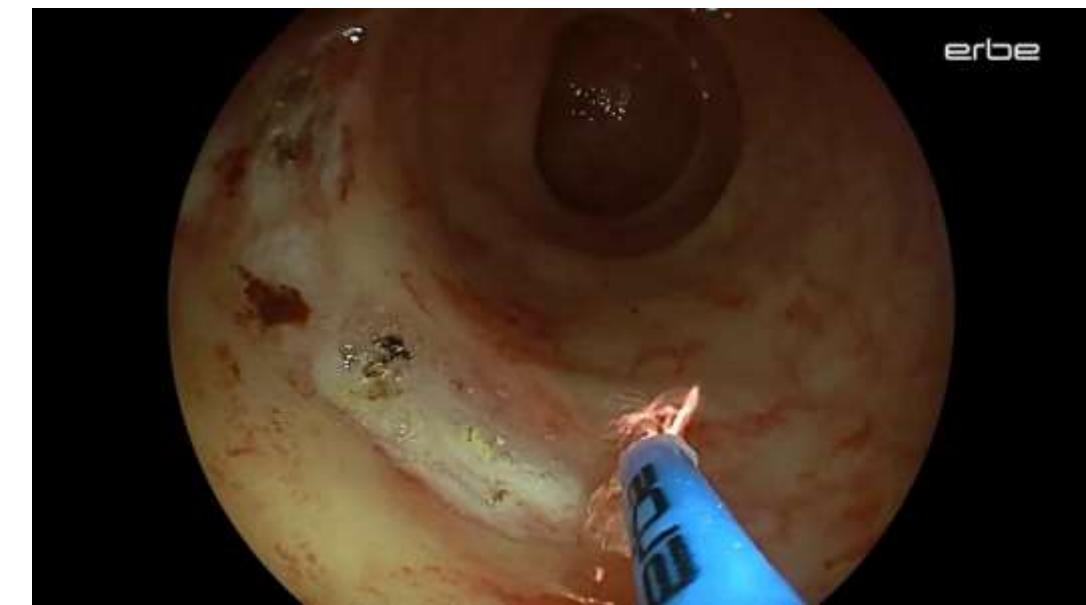


- Softer, **more flexible tip** to avoid trauma.
- Good for **narrow anatomy or sensitive tissue** (e.g., esophagus)

Thermal : APC Risk

FIRE Risk With APC :

APC carries a risk of fire because it produces high heat and electrical energy in the presence of oxygen and flammable gases.



Why fire risk happens:

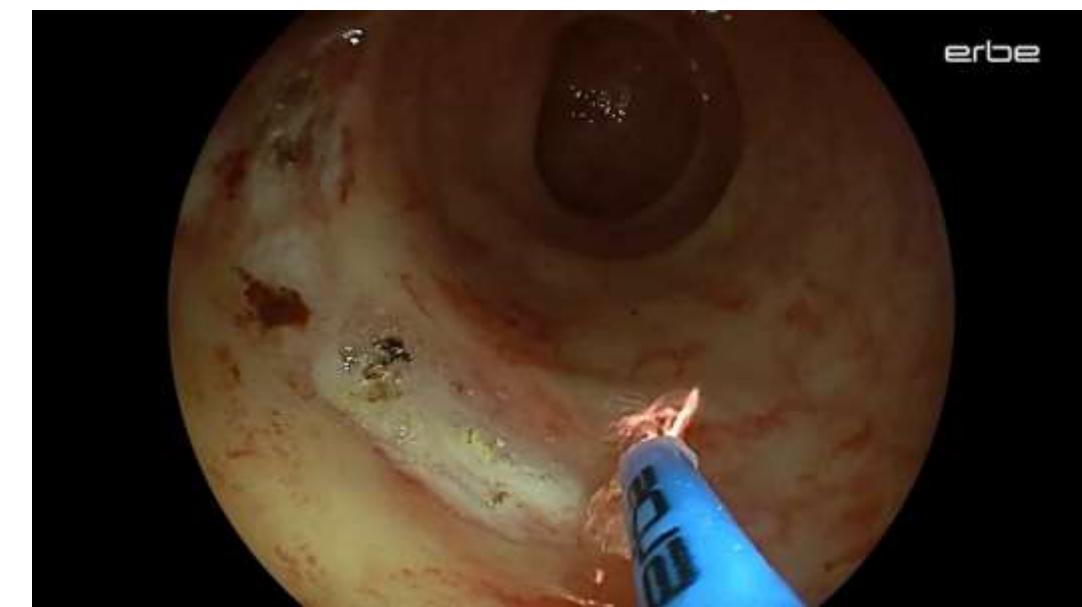
- APC uses ionized argon gas to deliver energy and create heat.
- The plasma tip can reach temperatures of $\sim 1000^{\circ}\text{C}$.
- In oxygen-rich environments, sparks can easily ignite.



Thermal : APC Risk

High-Risk Situations:

- Using APC while patient is on high-flow oxygen.
- APC in the colon with poor bowel preparation.
- APC near trachea or any airway structure.



How to Reduce Fire Risk:

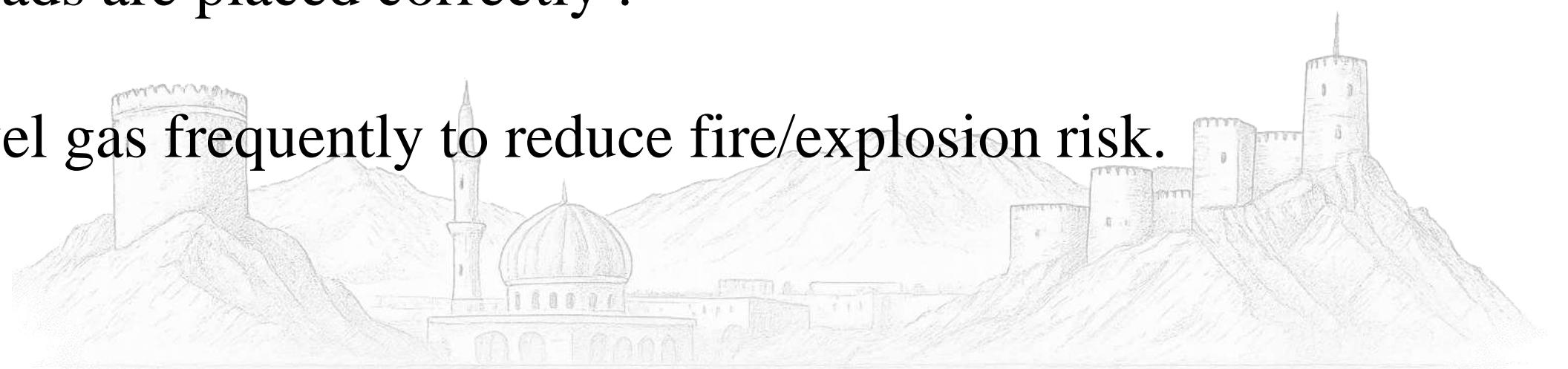
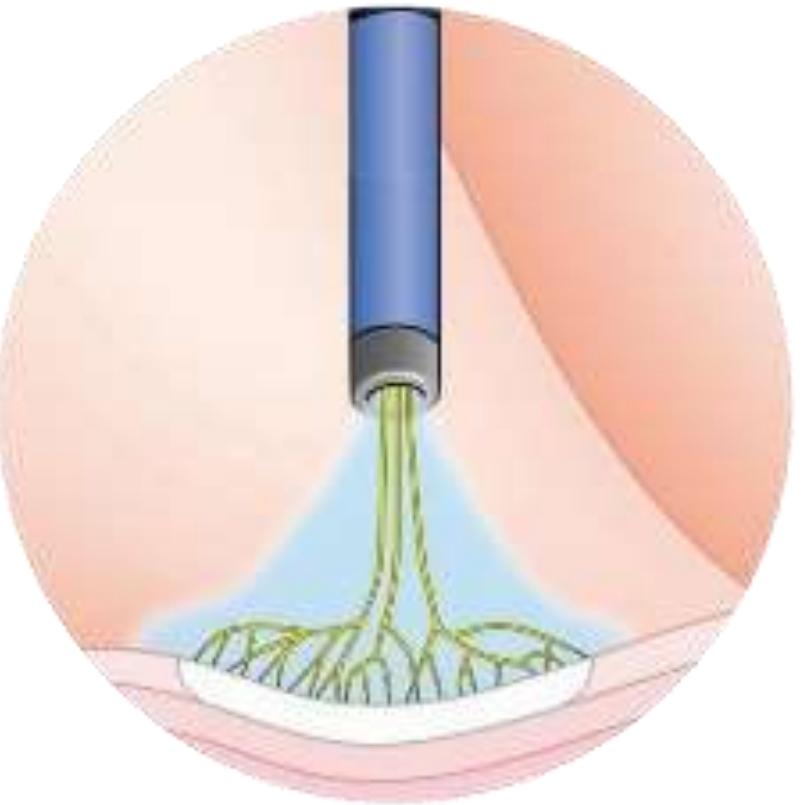
- Use the lowest possible FiO_2 .
- Reduce oxygen during APC activation.
- Fully suction trapped bowel gas before APC.
- Use the lowest effective power setting.



Thermal : APC don't/ do list

DO

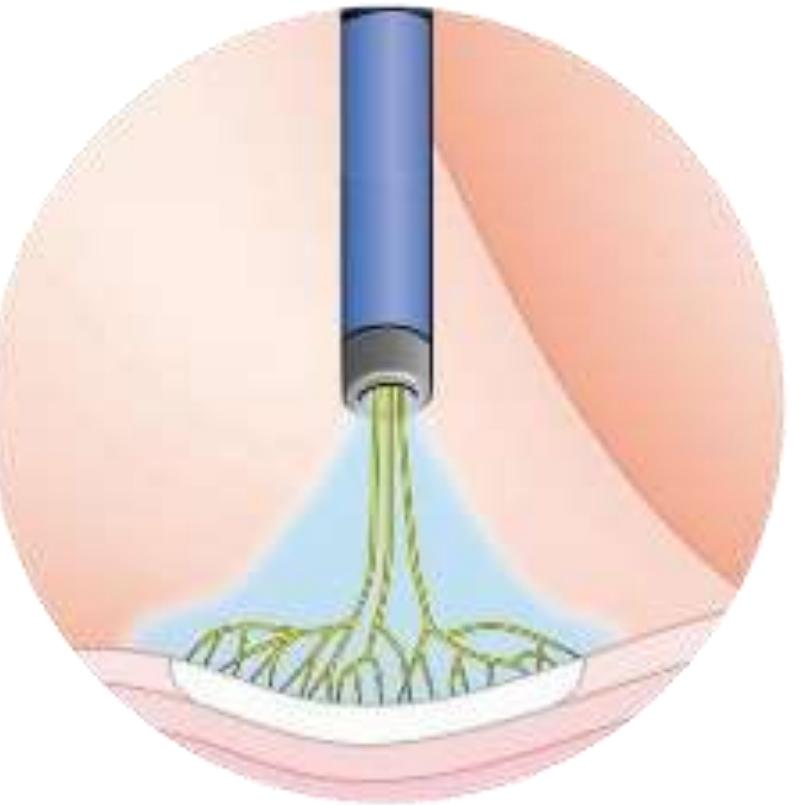
- ✓ Confirm settings (power + gas flow) before starting.
- ✓ Confirm correct probe type and integrity.
- ✓ Test fire the catheter. (BURG TWIC).
- ✓ Ensure the patient has proper bowel preparation (especially for colon cases).
- ✓ Ensure the APC probe tip is always visible on the endoscopy screen before activation.
- ✓ Ensure grounding pads are placed correctly .
- ✓ Suction excess bowel gas frequently to reduce fire/explosion risk.



Thermal : APC don't/ do list

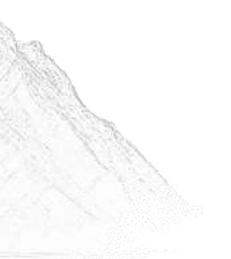
Dont:

- ✗ Don't fire if the tip is not visible.
- ✗ Don't fire in a distended or tight lumen.
- ✗ Don't allow contact between the catheter tip and the mucosa.
- ✗ Don't permit long, continuous APC firing without breaks.



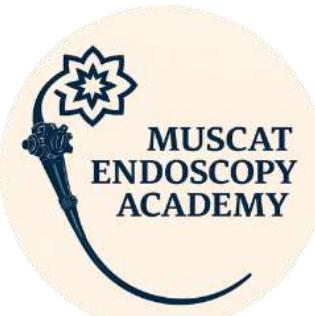
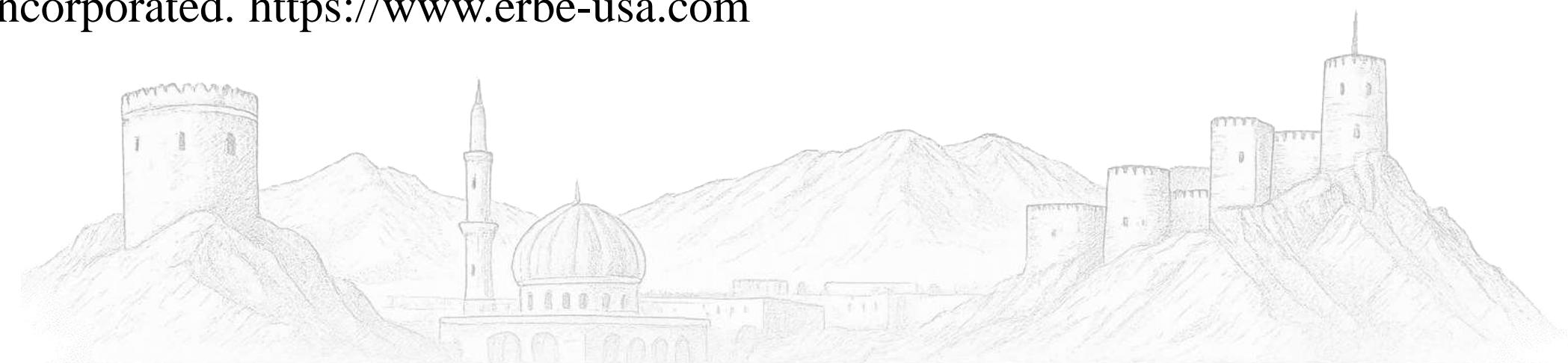
Nursing Endoscopy role in Argon Plasma Coagulation (APC):

Category	Nursing Responsibilities
Patient & Safety Preparation	<ul style="list-style-type: none">• Confirm patient ID, consent, allergies, indication• Reduce FiO_2 to safe level• Apply grounding pad correctly• Apply monitoring: SpO_2, ECG, BP
Equipment & Room Setup	<ul style="list-style-type: none">• Prepare APC unit, generator, argon gas• Confirm settings (Watt, gas flow, mode)• Check all connections• Ensure suction is ready
Procedure Assistance	<ul style="list-style-type: none">• Handle APC probe safely• Maintain visualization• Control O_2; announce “APC ON”• Monitor patient and manage suction
Safety Monitoring	<ul style="list-style-type: none">• Watch for fire hazards• Ensure correct probe distance• Check grounding pad adhesion
Post-Procedure Care	<ul style="list-style-type: none">• Turn off and disconnect equipment• Observe for bleeding or perforation• Monitor recovery• Document settings and patient response



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