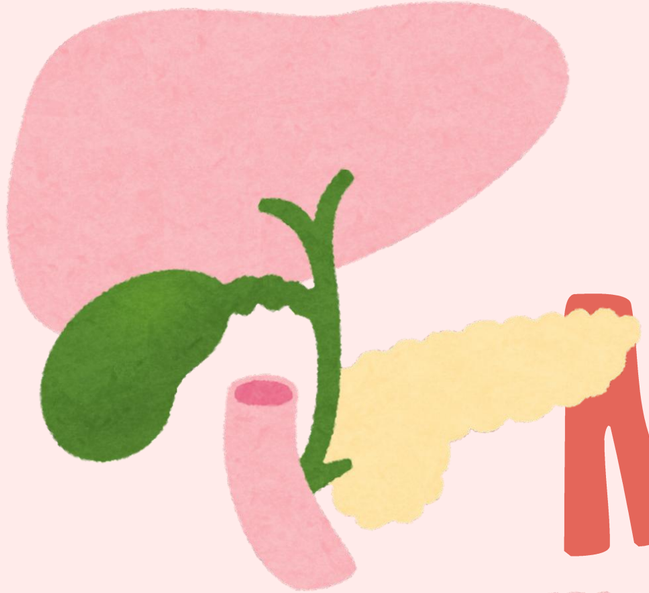
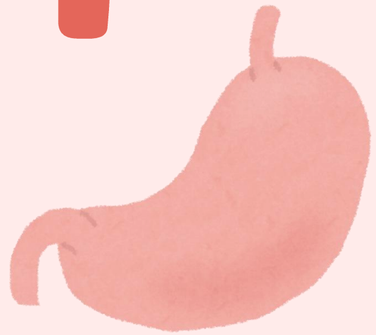


MALIGNANT POLYP



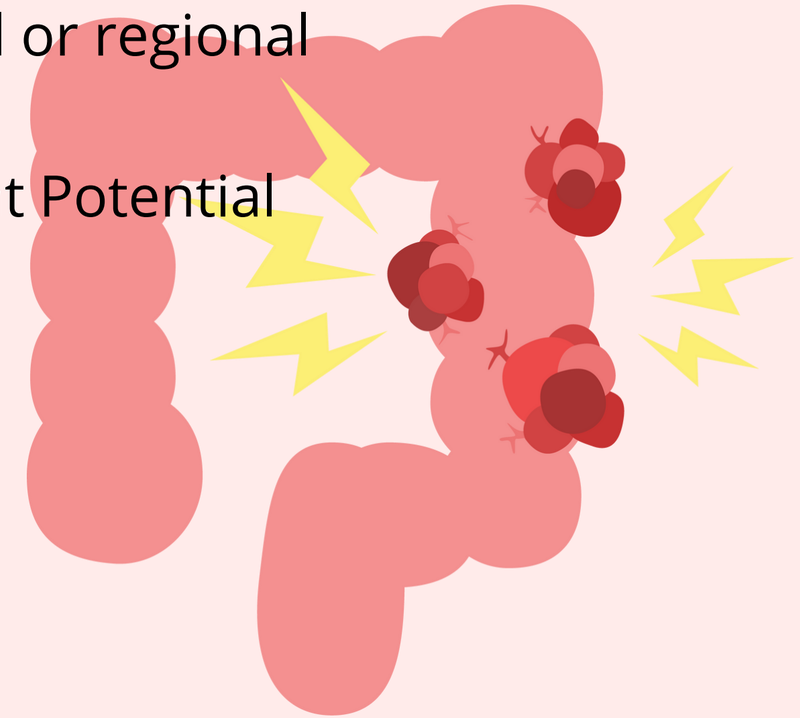
Presented by Dr Mohamad Hazeem

INTRODUCTION AND DEFINITION

Colorectal cancer (CRC) remains as one the most common form of gastrointestinal cancer around the world.In Malaysia, CRC is the second most common cancer in males and third most common cancer in females. Most colorectal carcinoma arises from the progression of adenoma from small to large polyps and then to dysplasia and carcinoma.

On average, it takes at least 10 years for this progression.Given that the slow and long duration in the process of conversion of colorectal adenomas into adenocarcinoma, early detection and colonoscopic removal of these precancerous polyps are very effective in reducing the incidence and mortality rate of CRC in long run

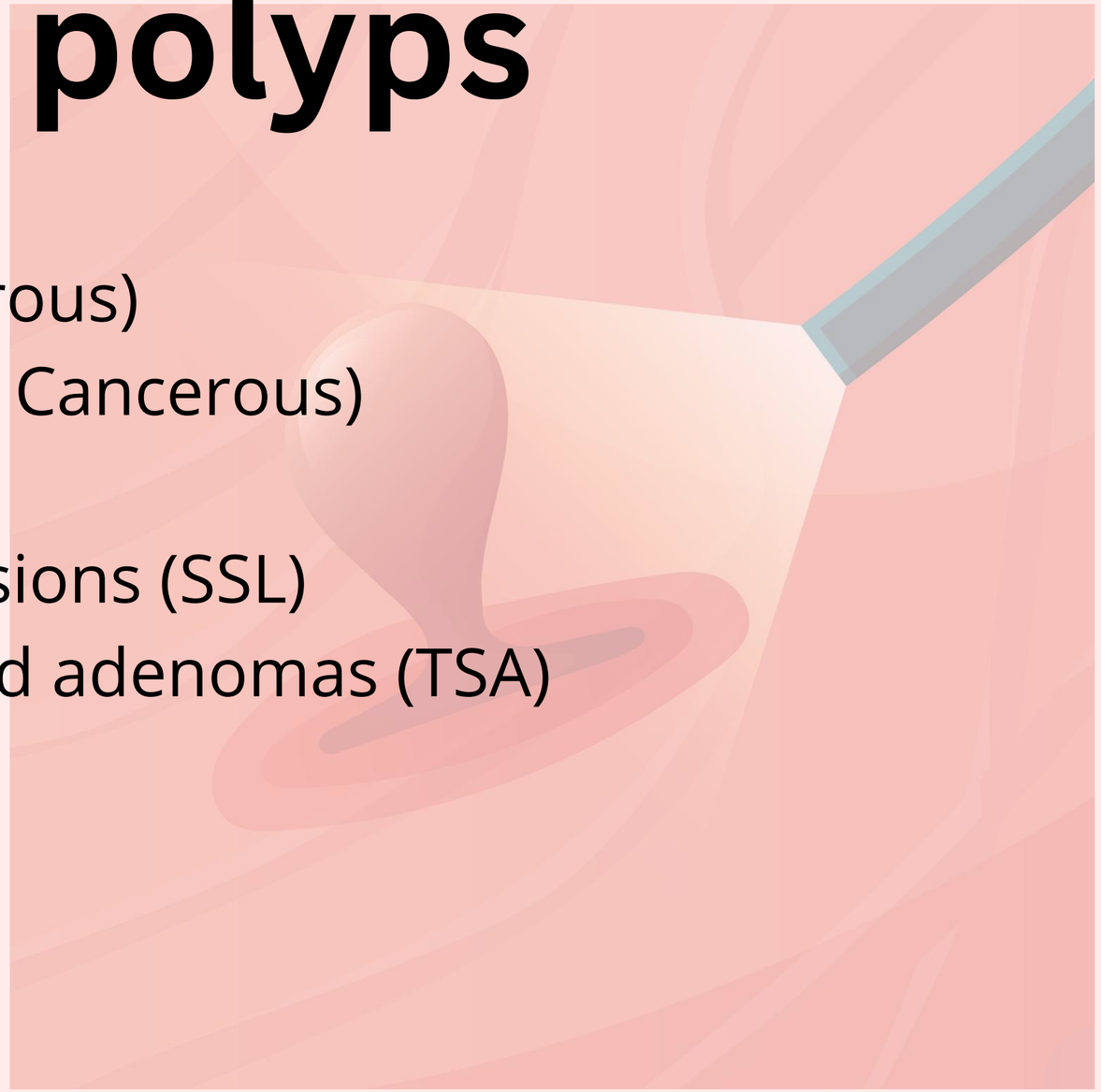
- Malignant polyps are define as sessile or pedunculated polyp that harbour cancer cells which have invade past the muscularis mucosae into the submucosa. **>= 1cm villous histology high grade dysplasia**
- incidence of colorectal polyp 0.75% to 6% of polyp excised
- **Local Data 20% Detection Rate**
- Classified as pT1 in TNM classification system
- Risk of Metastasis depends on morphology and histologycal features
- Possibility of residual malignant cells within the bowel wall or regional lymph node
- Significance: Most polyp may be Benign **BUT** has Malignant Potential



Colonic polyps

Classification

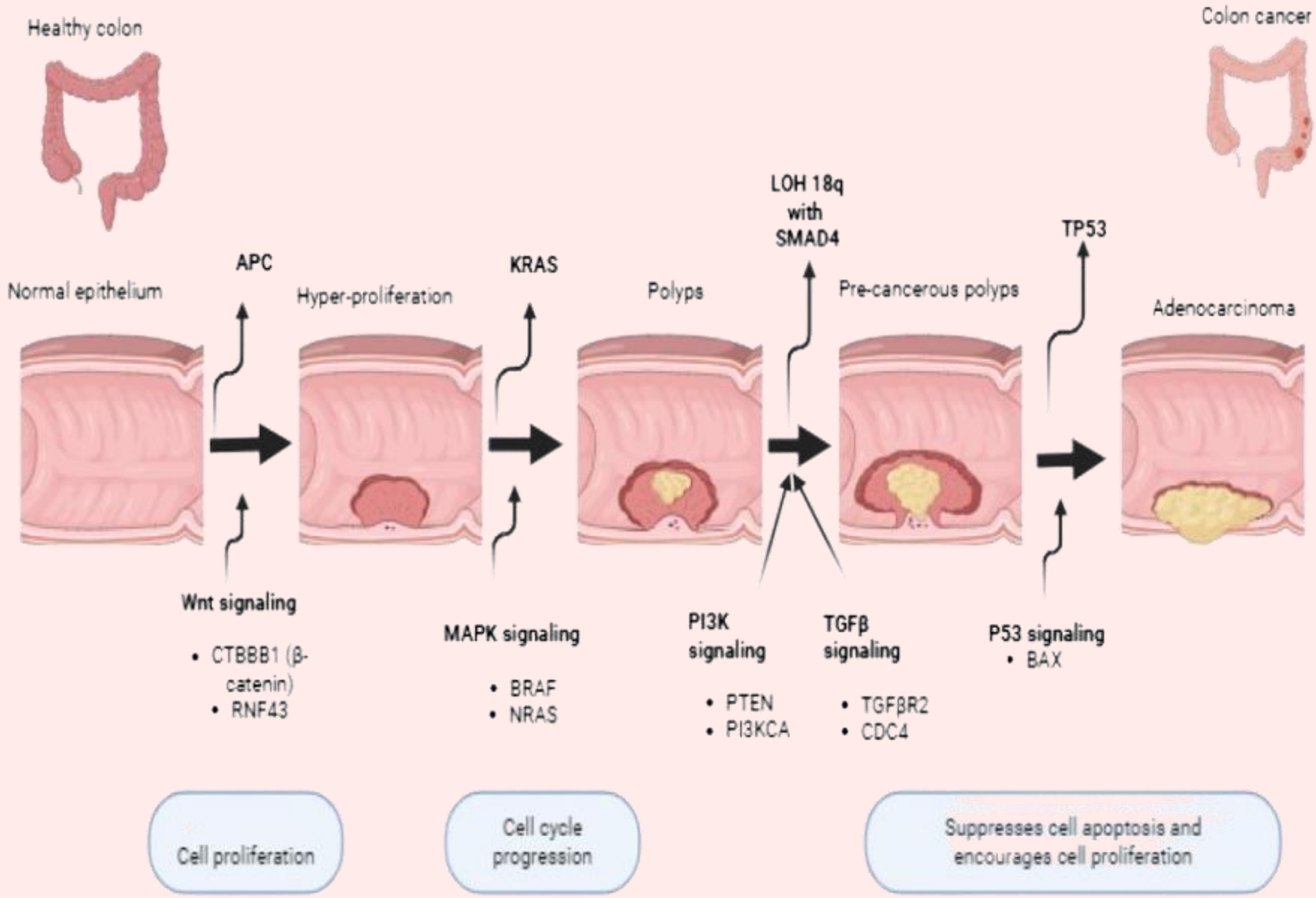
- Adenomas (Cancerous)
- Hyperplastic (Non- Cancerous)
- Serrated
- Sessile serrated lesions (SSL)
- Traditional serrated adenomas (TSA)



Adenomatous polyps

- ~2/3 of all colonic polyps
- 5-7% may demonstrate high grade dysplasia
- 3-5% may demonstrate invasive carcinoma
- Likelihood of showing advanced histologic features increases with polyp size
- <5mm (1-2%)
- 5mm-10mm (7-12%)
- >1cm (20-30%)

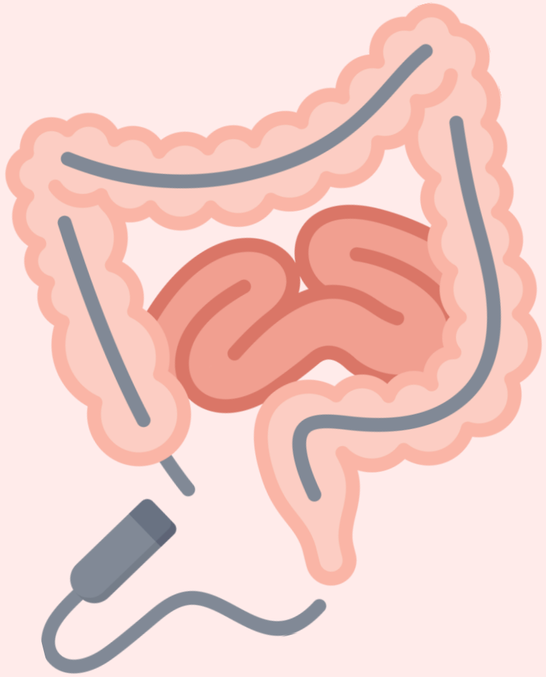
Size of adenoma (mm)	Proportion of polyps (%)	Carcinoma in polyp (%)
< 5	44.9	0
6–15	31.5	2.2
16–25	9.4	18.7
26–35	4.6	42.7
> 35	9.6	75.8
All	100	11.7



The adenoma-carcinoma model describing tumor progression steps from normal epithelial to cancer stage. **Mutation in adenomatous polyposis coli (APC) gene** is the first gene to be mutated and through the Wnt signaling pathway, it leads to hyper-proliferation of the epithelial cells. Next, mutations in **Kristen Rat Sarcoma Viral Oncogene homolog (KRAS)** cause cell cycle progression through the MAPK signaling pathway to promote the formation of larger adenoma polyps and pre-cancerous polyps. The loss of **Mothers Against Decapentaplegic Homolog 4 (SMAD4),** along with Loss of heterozygosity 18q (LOH 18q) via the TGF-β and PI3K along with mutations in **tumor protein 53 (TP53) via the TP53 signaling** pathway are acquired later in adenocarcinoma stages. These mutations further suppress cell death and encourage cell proliferation and are reported as bad prognoses for colorectal cancer diagnosis.

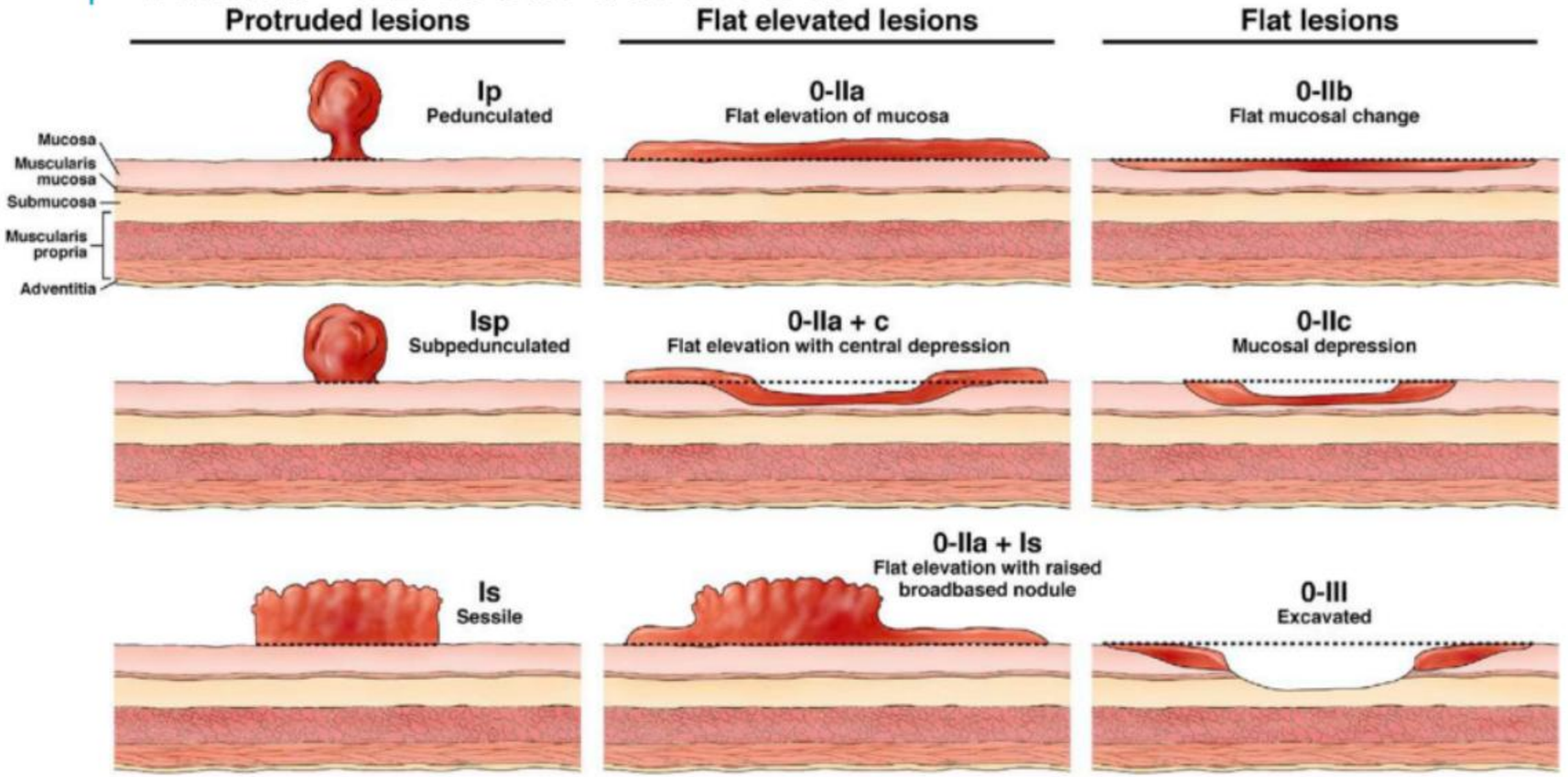
Classification

Multiple Classification to describe malignant polyp

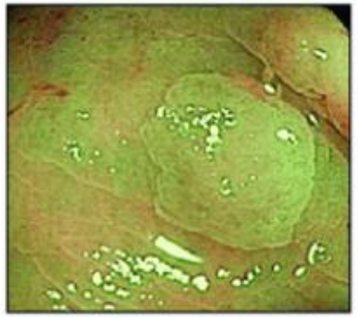
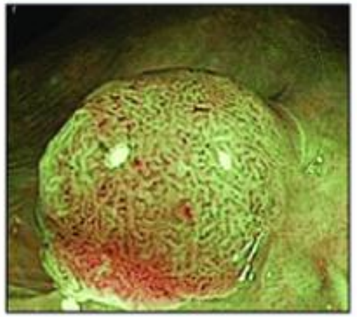
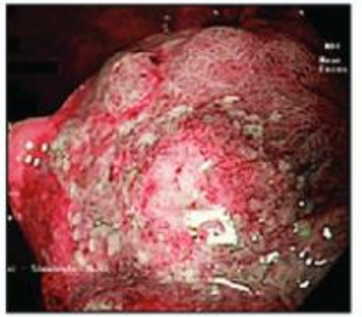


1. PARIS CLASSIFICATION
2. NICE CLASSIFICATION
3. KUDOS CLASSIFICATION
4. SANO CLASSIFICATION
5. JNET CLASSIFICATION

PARIS CLASSIFICATION



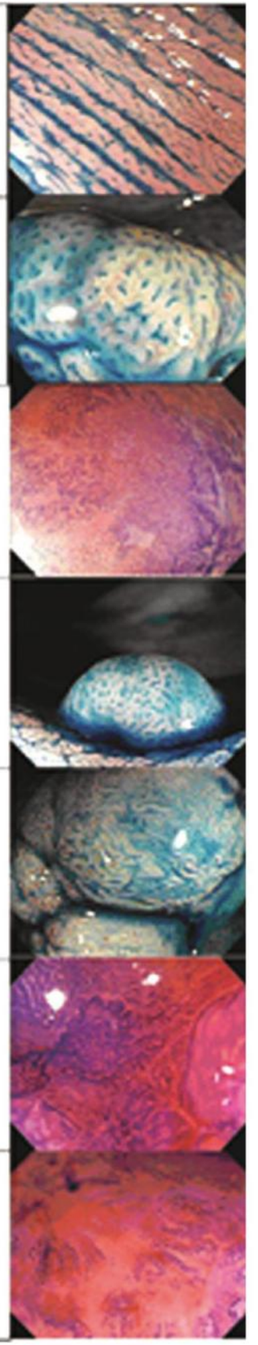
NICE CLASSICFICATION

	Type 1	Type 2	Type 3
Color	Same or lighter than background	Browner relative to background (verify that color arises from vessels)	Brown to dark brown relative to background, sometimes patchy whiter areas
Vessels	None or isolated lacy vessels coursing across the lesion	Brown vessels surrounding white structures	Has area(s) with markedly distorted or missing vessels
Surface pattern	Dark or white spots of uniform size, or homogeneous absence of pattern	Oval, tubular, or branched white structures surrounded by brown vessels	Areas with distortion or absence of pattern
Most likely pathology	Hyperplastic	Adenoma	Deep submucosally invasive cancer
			

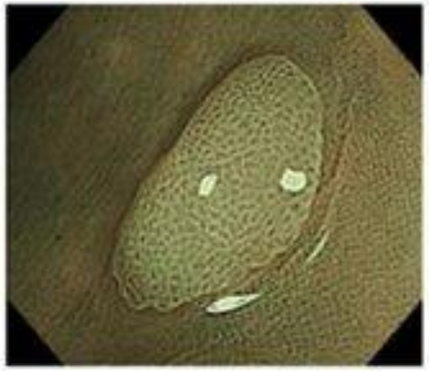
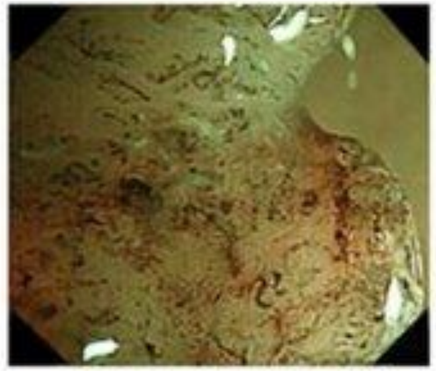
Narrow-band imaging International Colorectal Endoscopic (NICE) classification. Adapted from Hayashi N, et al. Gastrointest Endosc 2013;78:625-632. 7

KUDO CLASSIFICATION

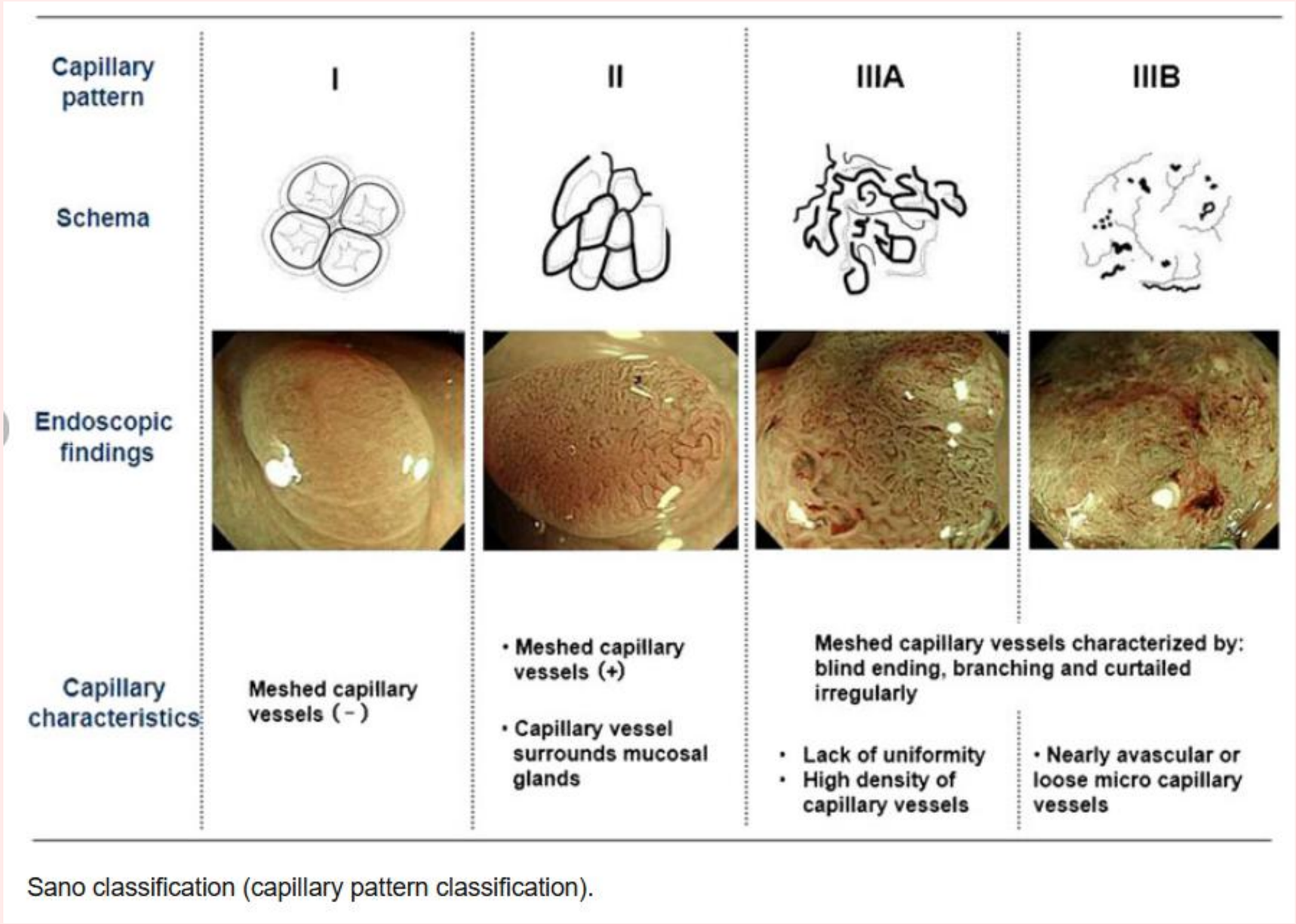
I		Round pit (normal pit)
II		Asteroid pit
IIIs		Tubular or round pit that is smaller than the normal pit (Type Ⅰ)
IIIL		Tubular or round pit that is larger than the normal pit (Type Ⅰ)
Ⅳ		Dendritic or gyrus-like pit
VI		Irregular arrangement and sizes of IIIL, IIIs, Ⅳ type pit pattern
VN		Loss or decrease of pits with an amorphous structure



Tanaka, *et al*. *Gastrointest Endosc* 2006; 64: 604-13

	Type 1	Type 2A	Type 2B	Type 3
Vessel pattern	・Invisible *1	・Regular caliber ・Regular distribution (meshed/spiral pattern) *2	・Variable caliber ・Irregular distribution	・Loose vessel areas ・Interruption of thick vessels
Surface pattern	・Regular dark or white spots ・Similar to surrounding normal mucosa	・Regular (tubular/branched/papillary)	・Irregular or obscure	・Amorphous areas
Most likely histology	Hyperplastic polyp/ Sessile serrated polyp	Low grade intramucosal neoplasia	High grade intramucosal neoplasia/ Shallow submucosal invasive cancer *3	Deep submucosal invasive cancer
Endoscopic image				

JNET Classification



Sano classification (capillary pattern classification).

SANO CLASSIFICATION

Summary of polyp features favouring malignant change

1 Larger and/or flatter polyps.

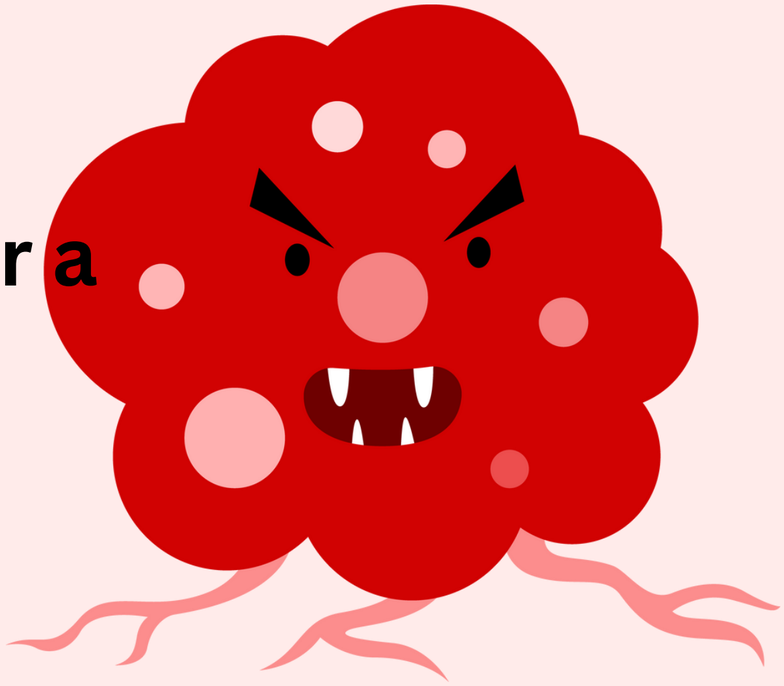
2 Polyps with ulceration, an irregular contour or firmness.

3 Hard consistency and broadening of stalk.

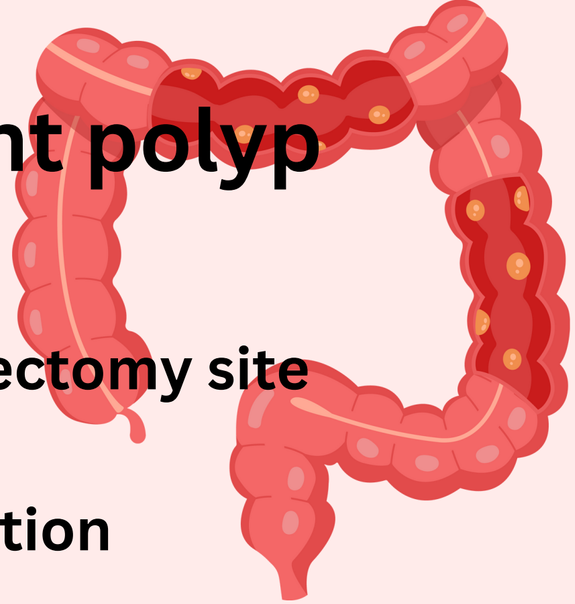
4 Paris Type 0-IIc.5 Kudo pit pattern type V (especially nonstructural).

6 Lateral spreading tumour – nongranular or a nodule
in a granular type.

7 Nonlifting sign present.



What to do upon encountering a malignant polyp



1.Site

a)Confirm site – may require re-colonoscopy to assess polypectomy site

b)If previously tattooed for identification

c)Reassess site : residual polyp, previous tattoo, confirm location

2.HPE

a)Favourable features

b)Polyps removed in one-piece , Early T1 tumours

c)Well-differentiated tumour

D)Absent LVI

E)Negative resection margins (submucosal resection <1mm)

F)No tumour budding

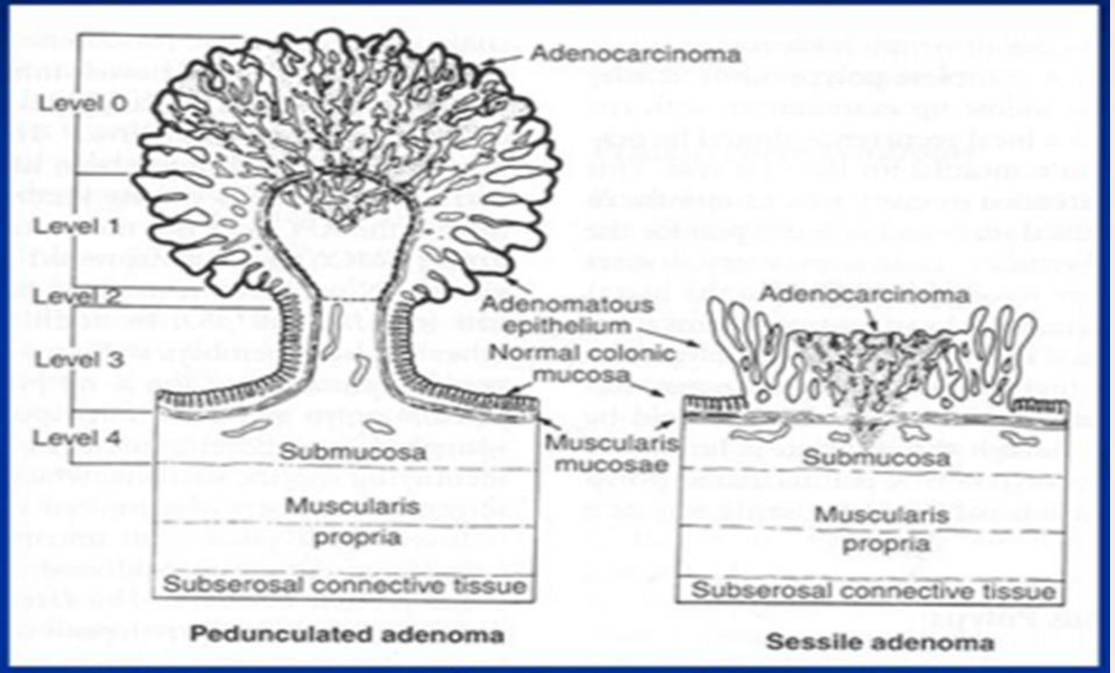
G)Size <0.5mm

3)May benefit from discussion with Pathologist regarding (a)

Haggitt Level (1985)

Classification of polyps with invasive cancer

Level	Definition	Resected (N)	+ LN (N)
0	Carcinoma in situ		
1	Invasion of head	6	0 (< 1%)
2	Invasion of neck	3	0 (< 1%)
3	Invasion of stalk	4	0 (< 1%)
4	Invasion of submucosa of bowel wall below polyp	13	4 (31%, 12-25%)



Haggitt RC, Glotzbach RE, Soffer EE, Wruble LD. Prognostic factors in colorectal carcinoma arising in adenomas: Implications for lesions removed by endoscopic polypectomy. Gastroenterology 89:328-36, 1985, p 330.

Villuous/sessile (flat) polyps with invasive cancer are by definition Haggitt 4.

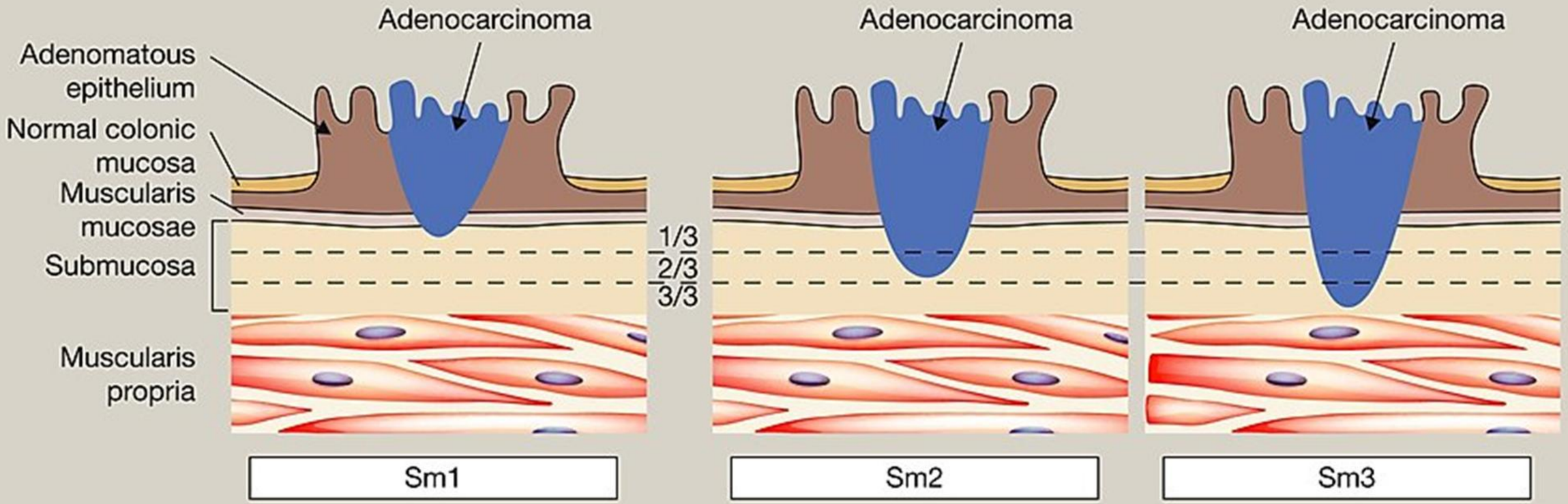
Resection Margin : Positive margin has been defined as:
1.Tumour extending to ≤1 mm of the resected margin (The Royal College of Pathologists, 2017)

Lymphvascular invasion : Defined by the presence of tumour cells within an endothelial-lined channel

Tumour Budding : defined as a single tumour cell or a cell cluster of up to 4 tumour cells at the advancing edge of the tumour

Presence of tumour budding was associated with increased rate of nodal metastases (OR 7.74, 95% CI: 4.47–13.39, P<0.001)

The Kikuchi classification of depth of invasion into the submucosa of a malignant sessile polyp[17]



Kikuchi classification

Sm1 – invasion into upper 1/3 of submucosa
Sm2 – invasion into upper 2/3 of submucosa
Sm3 – invasion into lower 1/3 of submucosa

3.Assess “resectability”

a)CT staging

b)Location

c)Histological factor – unfavourable factors recommended for surgical resection

4.Assess “Operability”

a)Patient co-morbidity

b)ECOG status

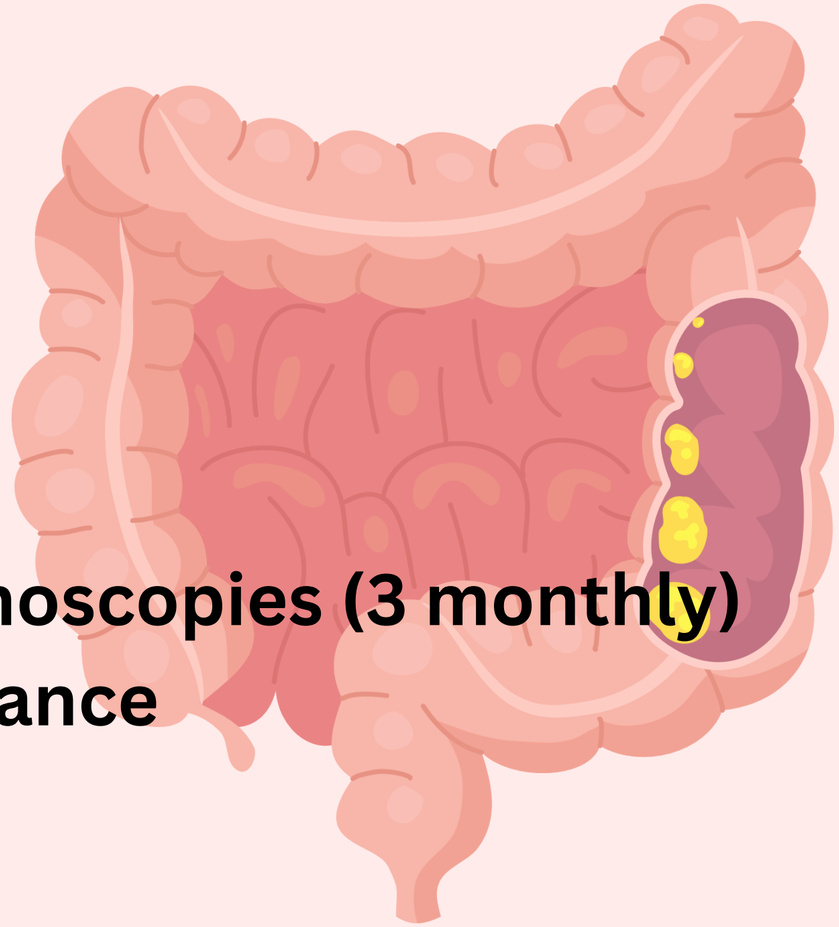
c)Family factors (patient care/follow-up)

5.In cases where site is unable to be confirmed (no previous tattoo, repeat colono unable to identify previous polypectomy site)

a)If patient is deemed operable à recommended for surgical resection

b)PET not well established as of now

6.If not operable



7.Multidisciplinary Team

8.Surveillance

a)Option of short-term surveillance by colonoscopies (3 monthly)

b)Consult with Oncology – Systemic surveillance

TABLE 1. Risk stratification of polyps according to histological parameters as per Association of Coloproctology of Great Britain and Ireland guidelines

Histological polyp characteristics	*Points score*
Resection margin <1 mm	4
Resection margin 1–2 mm	1
Pedunculated polyp Haggitt level 4	4
Sessile polyp Kikuchi level 3	4
Sessile polyp Kikuchi level 2	2
Poor differentiation	3
Lymphovascular invasion	2
Tumor budding	1
Mucinous tumor	1

Classification of polyp	*Cumulative score*	*Estimated risk of residual disease, %*
Very-low-risk polyp	0	<3
Low-risk polyp	1	<5
Medium-risk polyp	2	5–10
High-risk polyp	3	8–15
Very-high-risk polyp	>4	>20

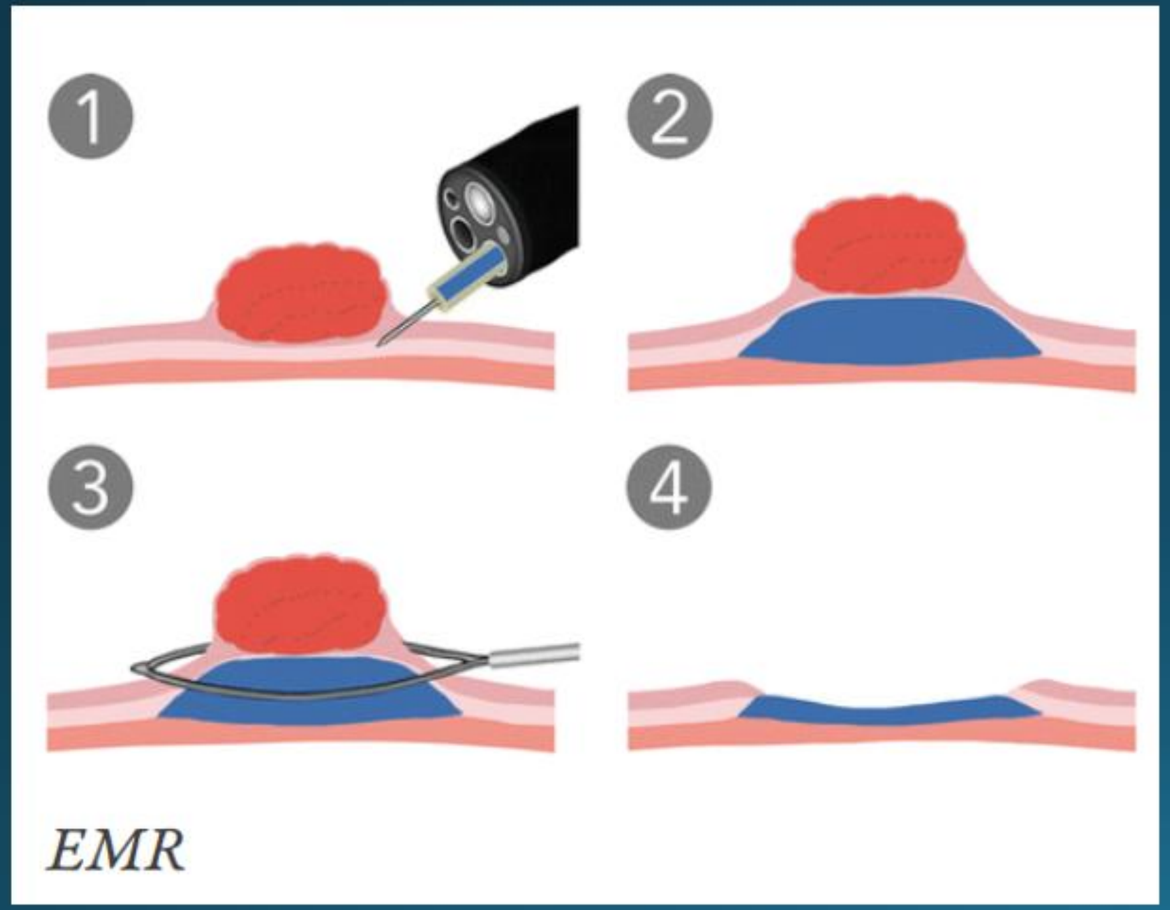
Risk stratification score is used to

- **Determine next further management**
- **Classify patient chance of recurrence**

Choices of Surgery

1. Surgical Resection of colon
2. (ESRD) Endoscopic Submucosal Dissection
3. (EMR) Endoscopic Mucosal Resection

EMR

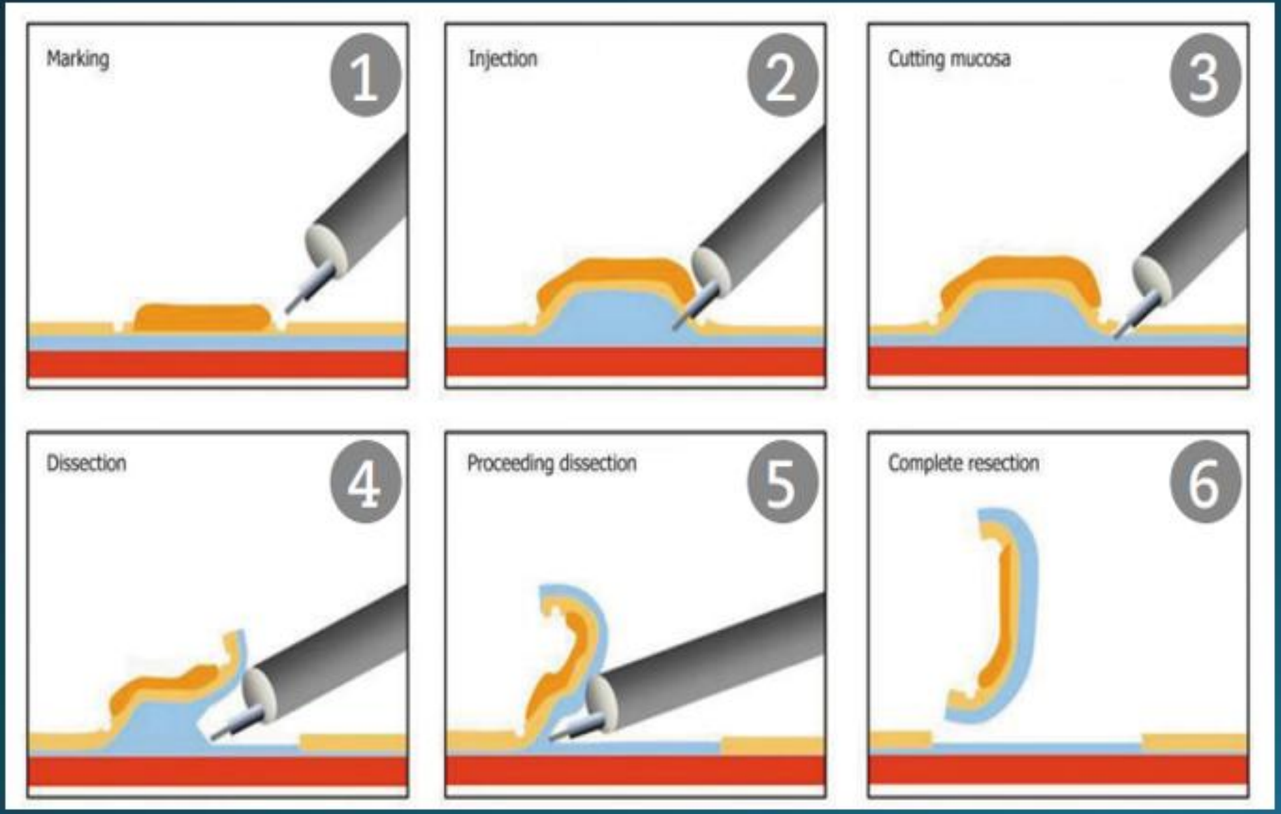


- Complete resection >90% cases.
- Limitation:
  - Lesion >20mm
  - Piecemeal EMR bear risk of recurrence ~7-25%

Moss SJ, Williams LF, Hourigan LF, et al. Long-term adenoma recurrence following wide-feld endoscopic mucosal resection (WF-EMR) for advanced colonic mucosal neoplasia is infrequent: results and risk factors in 1000 cases from the Australian Colonic EMR (ACE) study. Gut. 2015;64:57–65.

Khashab M, Eid E, Rusche M, et al. Incidence and predictors of "late" recurrences after endoscopic piecemeal resection of large sessile adenomas. Gastrointest Endosc. 2009;70:344–9.

ESD

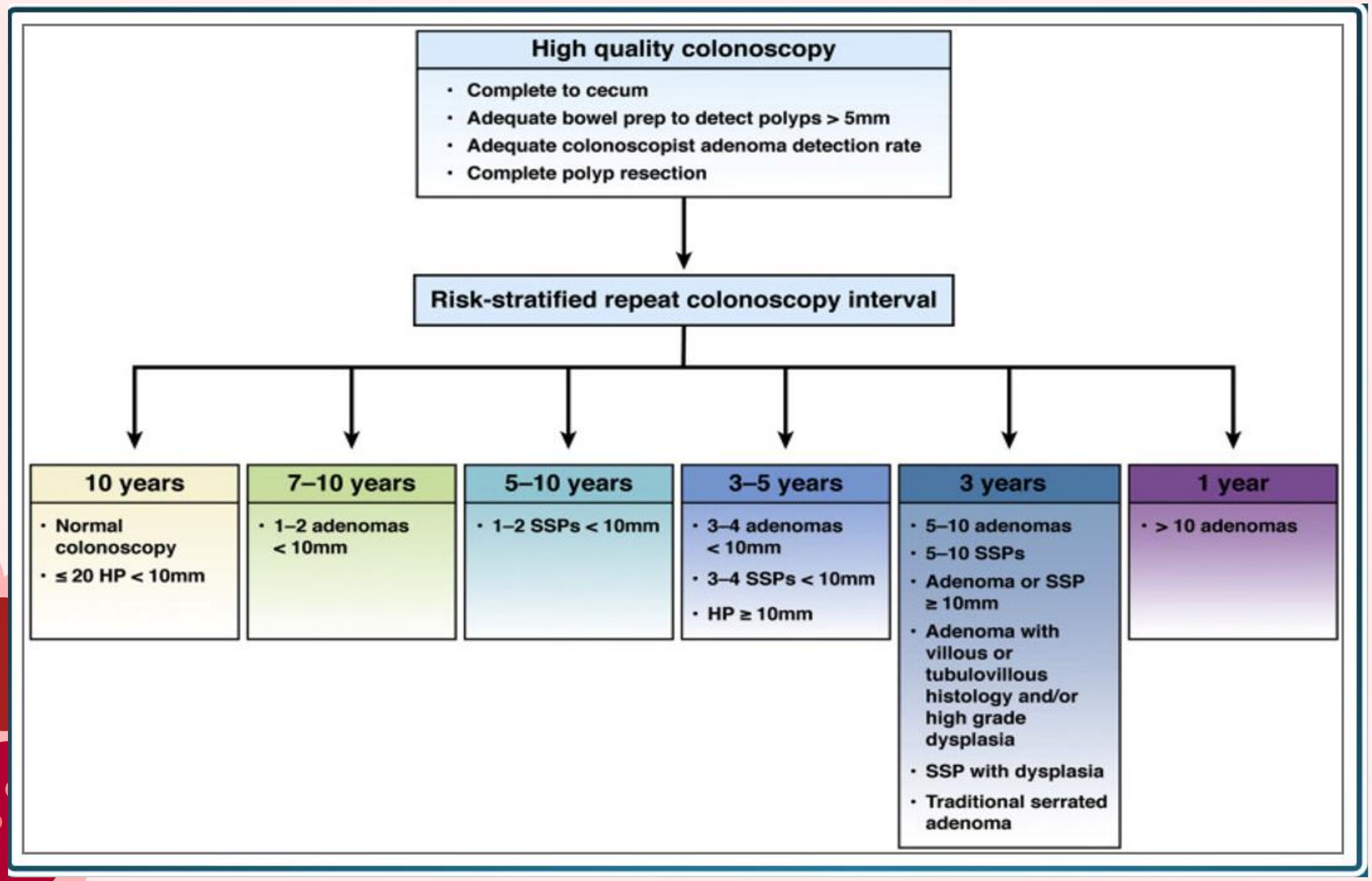


- Permits en-bloc resection any lesion, any size

- Limitation:
  - Perforation risk: 2-5%, <1% required surgery
  - Complex
  - Steep learning curve

Lee EJ, Lee JB, Lee SH, et al. Endoscopic submucosal dissection for colorectal tumors – 1,000 colorectal ESD cases: one specialized institute's experiences. Surg Endosc. 2013;27:31–9.
Saito Y, Uraoka Y, Yamaguchi Y, et al. A prospective, multicenter study of 1111 colorectal endoscopic submucosal dissections (with video). Gastrointest Endosc. 2010;72:1217–25.

Surveillance for Adenomas



Sources

1. Williams, J. G., Pullan, R. D., Hill, J., Horgan, P. G., Salmo, E., Buchanan, G. N., ... & Haboubi, N. (2013). Management of the malignant colorectal polyp: ACPGBI position statement. Colorectal Disease, 15, 1-38.
2. Sharma, V., Junejo, M.A., & Mitchell, P.J. (2019). Current Management of Malignant Colorectal Polyps Across a Regional United Kingdom Cancer Network. Diseases of the Colon & Rectum.
3. Tanaka, S., Saitoh, Y., Matsuda, T., Igarashi, M., Matsumoto, T., Iwao, Y., ... & Koike, K. (2021). Evidence-based clinical practice guidelines for management of colorectal polyps. Journal of Gastroenterology, 56(4), 323-335.
4. Tan, Y. J., Wendy, T., & Chieng, J. Y. (2019). Detection rate of colonic polyp among patients who had undergone colonoscopy at gastroenterology unit of Serdang Hospital, Malaysia. Med J Malaysia, 74(1), 21.
5. Pu, L. Z. C. T., Cheong, K. L., Koay, D. S. C., Yeap, S. P., Ovenden, A., Raju, M., Ruszkiewicz, A., Chiu, P. W., Lau, J. Y., & Singh, R. (2018). Randomised controlled trial comparing modified Sano's and narrow band imaging international colorectal endoscopic classifications for colorectal lesions. *World journal of gastrointestinal endoscopy*, *10*(9), 210–218. https://doi.org/10.4253/wjge.v10.i9.210