Colon Polyps

**Adenoma**

"Picket fence" nuclei: Elongated, Pencillate, pseudostratified, hyperchromatic
Nuclei retain basal orientation (bottom 1/2 of cell)
Low grade dysplastic changes should involve at least the upper half of the crypts and the luminal surface

<table>
<thead>
<tr>
<th></th>
<th>Tubular</th>
<th>Tubulovillous</th>
<th>Villous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tubules</td>
<td>&gt;75%</td>
<td>25-75%</td>
<td>&lt;25%</td>
</tr>
<tr>
<td>Villi</td>
<td>&lt;25%</td>
<td>25-75%</td>
<td>&gt;75%</td>
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</tbody>
</table>

High-grade dysplasia ("carcinoma in situ")
Significant cytologic pleomorphism
  Rounded, heaped-up cells, ↑ nuclear:cytoplasmic ratio
  Nuclei: “Open” chromatin, prominent nucleoli
  Lose basal orientation, extend to luminal half of cell

Architectural complexity
  Cribriforming, solid nests, intraluminal necrosis
  Absence of definite breach of basement membrane

Intramucosal Carcinoma
Neoplastic cells through basement membrane
  Into lamina propria but not through muscularis mucosae
    Single cell infiltration, small and irregular/angulated tubules
  Marked expansion of back-to-back cribriform glands
No metastatic risk (paucity of lymphatics in colonic mucosa)

Desmoplastic response → Indicative of invasion into submucosa
Mutation Pathway: APC → KRAS → p53  (also often β-Catenin and SMAD4)

**Serrated Polyps**

Hyperplastic polyp (HP): Mucosal outgrowth characterized by elongated crypts lined by nondysplastic epithelium with surface papillary infoldings → serrated luminal contour

Sessile serrated adenoma (SSA) and sessile serrated polyp (SSP)
Usually large (≥1 cm) sessile right sided lesions
Architectural disturbances of the bases of crypts is required
  Marked dilation of crypts with flattened, horizontal bases
Number of crypts are required for the diagnosis is controversial
  The WHO requires at least three adjacent abnormal crypts
  A consensus conference recommends a single abnormal crypt
The majority of crypts lack the uniform pattern of proliferative bases

<table>
<thead>
<tr>
<th>Size of polyp</th>
<th>Left Colon</th>
<th>Right Colon</th>
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</thead>
<tbody>
<tr>
<td>1-5 mm</td>
<td>Vast majority HP</td>
<td>Mix of SSA and HP</td>
</tr>
<tr>
<td>6-9 mm</td>
<td>Mix of SSA and HP</td>
<td>Vast majority SSA</td>
</tr>
<tr>
<td>10+ mm</td>
<td>Vast majority SSA</td>
<td>Essentially all SSA</td>
</tr>
</tbody>
</table>

Mutation Pathway: Microsatellite instability (MLH1, MSH2, MSH6, or PMS2)
Peutz-Jeghers Polyp

**Hamartomas** (non-neoplastic)
Mutation in the STK11/LKB1 gene.
Most frequent in small intestine
**Multilobated**, may have papillary or frond-like surface
**Arborizing smooth muscle**
Generally cytologically bland epithelium
**Mucocutaneous melanotic macules** (lips and oral mucosa)
Increased **risk of many cancers**
(e.g., Stomach, Colon, Pancreas, Breast, etc...)

Juvenile Polyp

Common in **children**, but may occur at any age
Usually **smoothly spherical** pedunculated polyp
Prominent **cystically dilated glands**
Abundant **inflamed stroma**
Surface may be eroded
Dysplasia and carcinoma are very rare in sporadic polyps
≥5 polyps or extra-colorectal location may indicate Juvenile Polyposis syndrome

Prolapse Polyp

Changes may be seen secondary to rectal mucosal prolapse
Often anterior rectal wall within 12 cm of anal verge
Superficial ulceration or **erosion** of mucosa
Thickened, disorganized muscularis mucosae with extension into lamina propria→ **Smooth muscle surrounds individual crypts**
Regenerating mucosal epithelium may appear adenomatous
**Distorted crypts**, sometimes diamond-shaped

Traditional Serrated Adenoma

Prominent **serration** of glands
Columnar cells with mucin-depleted, **eosinophilic cytoplasm**
**Cytologic low grade dysplasia** throughout
  Hyperchromatic elongate nuclei
  Frequent nuclear stratification
Complex architecture with **ectopic crypt formation**
Often pedunculated and left sided