

AP Content Specifications

New validated practical knowledge

1. Breast

- a. Needle core biopsy diagnosis: when to excise and when not to excise.
- b. Basal cell phenotype breast cancer (see Hereditary adult tumors)
- c. Columnar cell lesions
- d. Her2-neu testing guidelines
- e. Sentinel lymph node biopsy
- f. Immunohistochemistry in breast pathology
 - i. Myoepithelial markers and stromal invasion
 - ii. Markers of lobular/ductal differentiation

References:

1. Jacobs, TW, Connolly, JL, Schnitt, SJ: Nonmalignant lesions in breast core needle biopsies: to excise or not excise? *Amer J Surg Pathol* 26:1095-110, 2002.
2. Schnitt, SJ, Vincent-Salomon, A: Columnar cell lesions of the breast. *Adv Anat Pathol* 10:113-24, 2003.
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7. Querici-Della R, et al.: A critique of the sentinel node concept (review); *Breast*. 15:693-7, 2006

8. Lerwill, M. Current practical applications of diagnostic immunohistochemistry in breast pathology. *Am J Surg Pathol*. 2004 Aug;28(8):1076-91.

2. Central Nervous System

- a. Diffuse gliomas: morphologic features and molecular markers
 - i. 1p/19q deletions in oligodendroglioma
 - ii. EGFR amplification in glioblastoma multiforme

References:

1. Van den Bent MJ and Kros JM: Predictive and prognostic markers in neurooncology. *Jour. Neuropath & Exptl. Neurol.* (JNEN) 66:1074-1081, December 2007.
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3. Aldape K, et al. Clinicopathologic Aspects of 1p/19q Loss and the Diagnosis of Oligodendroglioma. *Arch Path Lab Med*. 2007;131:242-251

3. Cytology

- a. Guidelines for cervical cytology screening and management and HPV testing: 2006 ASCCP Consensus Guidelines for management of abnormal cervical cytology
- b. Bethesda system of reporting of GYN cytology
- c. Endoscopic ultrasound-guided FNA diagnosis
- d. Fine needle aspiration of the thyroid.

References:

1. Wright TC Jr, Massad LS, Dunton CJ, Spitzer M, Wilkinson EJ, Solomon D; 2006 American Society for Colposcopy and Cervical Pathology-sponsored Consensus Conference. 2006 consensus guidelines for the management of women with abnormal cervical cancer screening tests. *Am J Obstet Gynecol*. 2007 Oct;197(4):346-55.
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6. Baloch ZW, Livolsi VA, Asa SL, Rosai J, Merino MJ, Randolph G, Vielh P, Demay RM, Sidawy MK, Frable WJ. Diagnostic terminology and morphologic criteria for cytologic diagnosis of thyroid lesions: A synopsis of the National Cancer Institute Thyroid Fine-Needle Aspiration State of the Science. *Diagn Cytopathol.* 2008; 36(6):425-37

4. Gastrointestinal

- a. Esophagus, stomach, intestines
 - i. Sessile serrated adenoma; serrated pathway for adenocarcinoma, hereditary non-polyposis carcinoma (also, see under “Hereditary adult tumors”)
 - ii. Gastrointestinal stromal tumor and its mimics.
 - iii. Esophagitis, eosinophilic esophagitis, reflux
 - iv. Microscopic colitis
 - v. Dysplasia in Barrett’s esophagus and inflammatory bowel disease
 - vi. Sprue, diagnosis with normal villous architecture, but with increased mucosal lymphocytes (lymphocytic enteritis)
- b. Liver
 - i. Grading and staging of chronic hepatitis
 - ii. Steatohepatitis, NASH
- c. Pancreas
 - i. Classification of pancreatic intraepithelial neoplasia, PANin.
 - ii. Intraductal papillary mucinous tumors
 - iii. Mucinous cystic tumors
 - iv. Autoimmune pancreatitis
 - v. Pancreatic endocrine neoplasms: diagnosis and prognosis

References:

1. Snover DC, Jass JR, Fenoglio-Preiser C, Batts KP. Serrated polyps of the large intestine: a morphologic and molecular review of an evolving concept. *Am J Clin Pathol.* 2005; 124(3):380-91
2. Li SC, Burgart L. Histopathology of serrated Adenoma, Its Variants, and Differentiation From Conventional Adenomatous and Hyperplastic Polyps. *Arch Pathol Lab Med.* 2007; 131:440-445.
3. Lazarus R., et al: The risk of metachronous neoplasia in patients with serrated adenoma. *Am. J. Clin. Pathol.* 123: 349-359, 2005. (follows the earlier important paper from the same group: Makinen MJ, et al: Colorectal carcinoma associated with

serrated adenoma--prevalence, histological features, and prognosis. *J. Pathol.* 193:286-294, 2001.)

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 6. Hruban,R.H.; Fukushima,N. Pancreatic adenocarcinoma: update on the surgical pathology of carcinomas of ductal origin and PanINs; *Modern Pathol* 2007; 20:S61-S70
 7. Hruban, R. et. al. An illustrated consensus on the classification of pancreatic intraepithelial neoplasia and intraductal papillary mucinous neoplasms. *Am J Surg Pathol.* 2004 Aug; 28(8):977-87
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- 5. Genitourinary**
- a. Prostate
 - i. Update on Gleason grading of prostate cancer
 - ii. Current immunohistochemistry in diagnosis of adenocarcinoma: Amicar, basal cell markers
 - iii. Criteria for prostatic adenocarcinoma, ASAP, PIN
 - iv. Newly described patterns of adenocarcinoma which mimic benign disease, including foamy gland carcinoma, atrophic carcinoma and pseudohyperplastic carcinoma.
 - v. Post treatment diagnosis of prostate cancer
 - vi. Intraductal carcinoma of the prostate
 - b. Bladder
 - i. Histologic variants of urothelial carcinoma, nested urothelial carcinoma, plasmacytoid, micropapillary, lymphoepithelioma-like variants
 - ii. Spindle cell proliferations
 - iii. WHO/ISUP classification of urothelial tumors
 - c. Kidney
 - i. Cytogenetics of renal neoplasms
 - ii. Classification of renal neoplasms
 - iii. Use of immunohistochemistry in renal neoplasms

- iv. Staging of renal cell carcinoma and renal sinus involvement
- d. Testis
 - i. Immunohistochemistry in diagnosis of testicular neoplasms; e.g. PLAP, OCT 3/4, inhibin, c-kit, CD30

References:

1. Epstein, JL, Allsbrook, WC, Jr, Amin, MB et al: The 2005 International Society of Urological Pathology (ISUP) Consensus Conference on Gleason grading of prostatic carcinoma. *Amer J Surg Pathol*. 29:1228-42, 2005.
2. Epstein JI, Allsbrook WC, Amin MB, Egevad LL. Update on the Gleason Grading System for Prostate Cancer. Results of an International Consensus Conference of Urologic Pathologists. *Adv Anat Pathol* 2006; 13: 57-59
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13. Skinnider, B. and Amin M. An immunohistochemical approach to the differential diagnosis of renal tumors. *Seminars in Diagnostic Pathology* 2005 22:51-68.
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15. Jones, et. al. OCT 4 staining in testicular tumors: a sensitive and specific marker for seminoma and embryonal carcinoma, *Am J Surg Pathol*. 2004;28:935-940.

6. Gynecology

- a. Ovary
 - i. Pseudomyxoma peritonei
 - ii. Mucinous ovarian tumors
 - iii. Serous borderline tumors and significance of micropapillary pattern
 - iv. New concepts in ovarian and pelvic serous carcinogenesis
 - a. Different molecular pathways in low grade serous carcinoma versus high grade serous carcinoma
 - b. The relationship between intraepithelial carcinoma of the fallopian tube and pelvic serous carcinomas.
- b. Diagnostic immunohistochemistry/biomarkers
 - i. P16/Ki-67 in HPV associated lesions
 - ii. WT-1 in ovarian/peritoneal serous tumors
- c. Prognostic parameters in endometrial carcinoma

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1. Borderline Ovarian Tumor Workshop, Bethesda, Maryland, August 27-28, 2003. *Hum Pathol* 2004; 907-960 (5 articles)
2. Shih IeM, Kurman RJ. Ovarian carcinogenesis: a proposed model based on morphological and molecular genetic analysis. *Am J Pathol* 2004 May;164(5):1511-8
3. Kindelberger DW et al. Intraepithelial carcinoma of the fimbria and pelvic serous carcinoma: Evidence for a causal relationship. *Am J Surg Pathol*. 2007 Feb;31(2):161-9.

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 8. Prat J. Prognostic parameters of endometrial carcinoma. *Hum Pathol.* 2004 Jun; 35(6):649-62
- 7. Hematopathology**
- a. Standardized WHO nomenclature (2001) for lymphoma, leukemia, myeloproliferative disorders, myelodysplastic disorders, plasma cell neoplasms
 - b. Minimal residual disease in acute leukemia.
 - c. Recently described lymphomas
 - i. Primary effusion lymphoma
 - ii. Plasmablastic lymphoma
 - d. Ancillary techniques
 - i. Transcription factors in lymphomas and leukemias
 - ii. New molecular markers, JAK-2
 - iii Gene profiling in lymphoma

References:

1. Campana D. Minimal residual disease studies in acute leukemia. *Am J Clin Pathol.* 2004 Dec; 122 Suppl:S47-57
2. Feldman AL, Dogan A.; Diagnostic uses of Pax5 immunohistochemistry. *Adv Anat Pathol.* 2007 Sep;14(5):323-34.
3. Ponzoni M, Arrigoni G, Doglioni C. New transcription factors in diagnostic hematopathology. *Adv Anat Pathol.* 2007 Jan;14(1):25-35

8. Hereditary Adult Tumors: current concepts

- a. BRCA 1 and 2
 - i. Breast – morphologic features and basal phenotype
 - ii. Ovary – morphologic features and risk
 - iii. Fallopian tube – morphologic features and handling of specimens for prophylactic bilateral salpingo-oophorectomies
- b. Hereditary Non-Polyposis colon cancer (HNPCC) and MSI
- c. Familial Adenomatous Polyposis and other polyposis syndromes

References:

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10. Jass JR. What's new in hereditary colorectal cancer? *Arch Pathol Lab Med.* 2005 Nov;129(11):1380-4.

9. Pulmonary

- a. Bronchoalveolar carcinoma and concept of "in-situ" adenocarcinoma
- b. Current concepts in interstitial lung disease
- c. Important histologic parameters in staging and prognosis of lung cancer

Reference:

1. Travis WD, Garg K, Franklin WA, et al. Bronchioloalveolar Carcinoma and Lung Adenocarcinoma: The Clinical Importance and Research Relevance of the 2004 World Health Organization Pathologic Criteria. *J. Thor Oncol* 2006; 1: S13-S19
2. Weydert JA, Cohen MB. Small peripheral pulmonary adenocarcinoma: morphologic and molecular update; *Adv Anat Pathol.* 2007 Mar;14(2):120-8
3. Travis WD, Garg K, Franklin WA, et al. Bronchioloalveolar Carcinoma and Lung Adenocarcinoma: The Clinical Importance and Research Relevance of the 2004 World Health Organization Pathologic Criteria. *J. Thor Oncol* 2006; 1: S13-S19
4. Weydert JA, Cohen MB. Small peripheral pulmonary adenocarcinoma: morphologic and molecular update; *Adv Anat Pathol.* 2007 Mar;14(2):120-8
5. Butnor, KJ, Cooper, K: Visceral pleural invasion in lung cancer: recognizing histologic parameters that impact staging and prognosis. *Adv Anat Pathol* 12:1-6, 2005

10. QA in anatomic pathology

- a. Use of standardized pathology protocols
- b. Error in anatomic pathology
- c. Critical diagnoses in anatomic pathology (critical values)

Reference:

1. http://www.cap.org/apps/docs/cancer_protocols/protocols_index.html
2. <http://adasp.org/Checklists/checklists.htm>
3. Renshaw AA, Gould EW. Measuring errors in surgical pathology in real-life practice: defining what does and does not matter. *Am J Clin Pathol.* 2007 Jan; 127(1):144-52
4. *Crossing the Quality Chasm. A New Health System for the 21st Century. Committee on Quality of Health Care in American*, Institute of Medicine
http://books.nap.edu/execsumm_pdf/10027.pdf

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11. Skin

- a. Desmoplastic melanoma
- b. Sentinel lymph node biopsy

Reference:

1. Busam, Klaus, J: Cutaneous desmoplastic melanoma. *Adv Anat Pathol* 12:92-102, 2005

12. Soft Tissue

- a. New concepts/update in classification:
 - i. Pleomorphic undifferentiated sarcoma (MFH)
 - ii. Hemangiopericytoma-Solitary Fibrous tumor
 - iii. Borderline vascular tumors
 - iv. Atypical lipomatous tumor-Well differentiated liposarcoma
- b. Interpretation of Needle Biopsy: Limitations and Grading
- c. New diagnostic markers:
 - i. MDM2/CDK4 (well differentiated liposarcoma)
 - ii. LANA-1 (Kaposi sarcoma)
 - iii. TFE3 (alveolar soft part sarcoma)
 - iv. WT1 (desmoplastic small round cell tumor)
 - v. beta-catenin (fibromatosis)
 - vi. ALK (inflammatory myofibroblastic tumor)
- d. Translocation-associated sarcomas vs. Non translocation sarcomas
- e. Biological and histological differences
- f. Molecular genetic identification of soft tissue tumors
- g. Recent entities:
 - i. Perineurioma
 - ii. PEComa
 - iii. Acral myxoinflammatory fibroblastic sarcoma
 - iv. Low grade fibromyxoid sarcoma
 - v. Desmoplastic small round cell tumor

References:

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3. Folpe, AL and Gown, A: Immunohistochemistry for analysis of soft tissue tumors in *Enzinger and Weiss’s Soft Tissue Tumors*, 5th edition, CV Mosby, 2007, p.119-174.
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13. Molecular

- a. Gene probe technology in tumor pathology
- b. Molecular markers in relation to chemotherapy: GIST
- c. Targeted therapies

Additional General References:

1. WHO Classification of Tumours. <http://www.iarc.fr/WHO-BlueBooks/>
2. AJCC Cancer Staging Manual, 6th edition. <http://www.cancerstaging.org/>