Learning Anatomic Pathology and Preparing for the Boards

(and "Kurt's Notes")

Kurt Schaberg M.D.

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Kurtsnotes.net

Disclosures

- None


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COLLEGE
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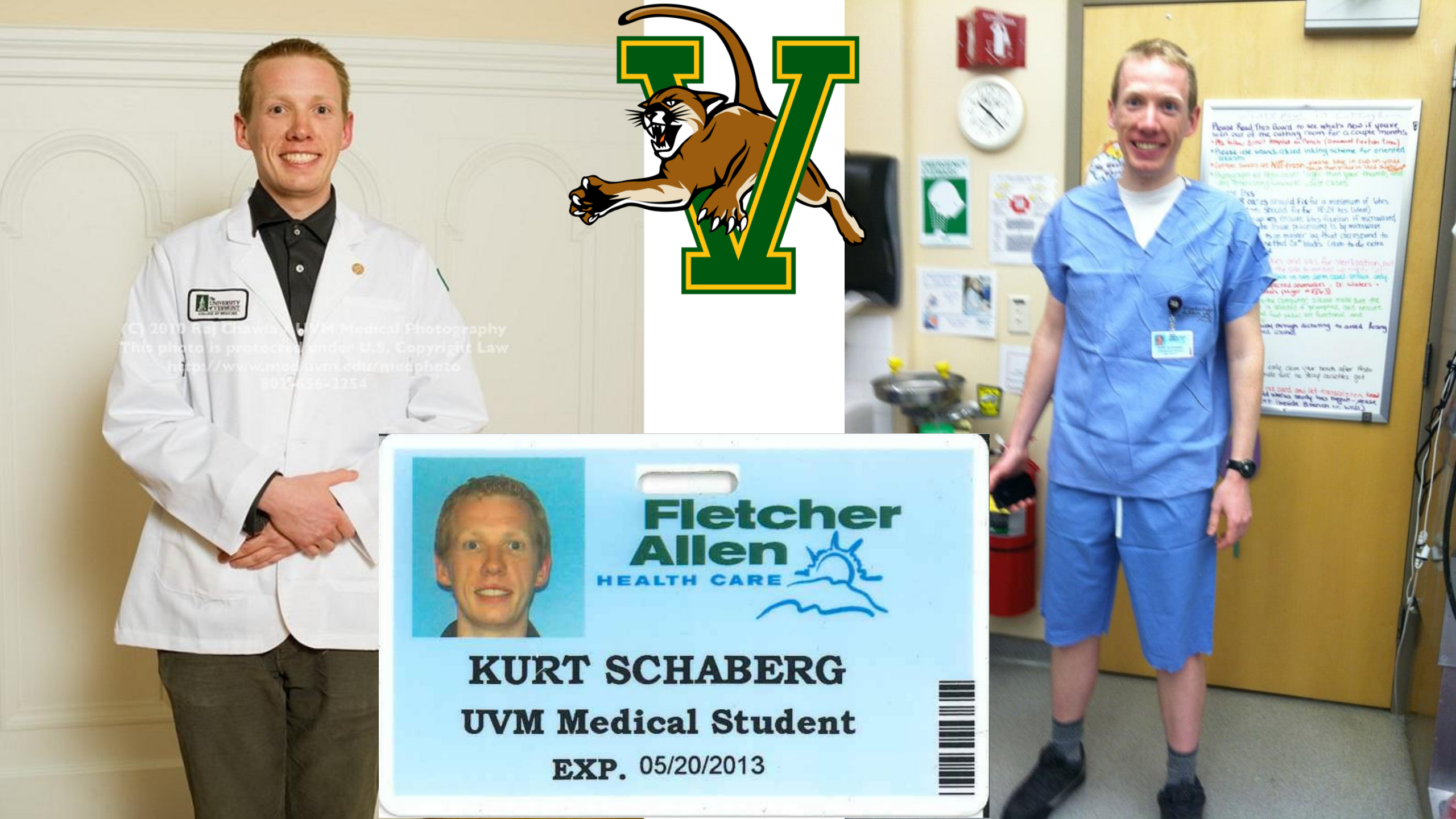
Issued: 08/09/05
Kurt Barret Schaberg
Date of Birth: 100385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UVM Medical Student
EXP. 05/20/2013


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M.D.
Stanford Hospital


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UK HealthCare


Kurt Schaberg
MD
22/23
Assistant Clinical Professor
Pathology & Lab Medicine
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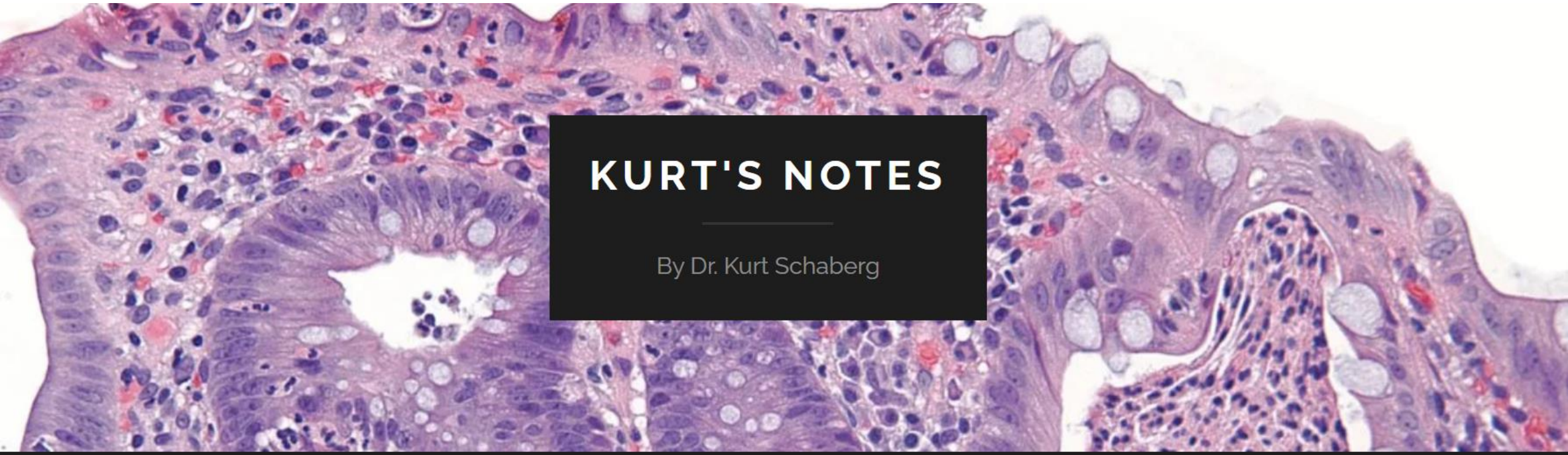

KURT'S NOTES

By Dr. Kurt Schaberg


Prostate Acinar Adenocarcinoma
Gleason Grading
1
Circumscribed nodule of closely packed but separate, uniform, rounded to oval, medium-sized acini
2
Should not be diagnosed regardless of the type of specimen, with extremely rare exceptions
3
Fairly circumscribed, yet at the edge of the tumor nodule there may be minimal infiltration
Glands are more loosely arranged and not quite as uniform as Gleason pattern 1
Very rarely diagnosed
4
Well-formed glands (with lumina)
Separate, Non-fused
Infiltration
5
Ill-defined, poorly formed glands
Gland fusion
ALL cribriform glands
Hypernephromatoid
Glomerulations (possibly)
Ductal Adenocarcinoma
Often Disqualifies from Active Surveillance
Essentially no glandular differentiation:
solid sheets
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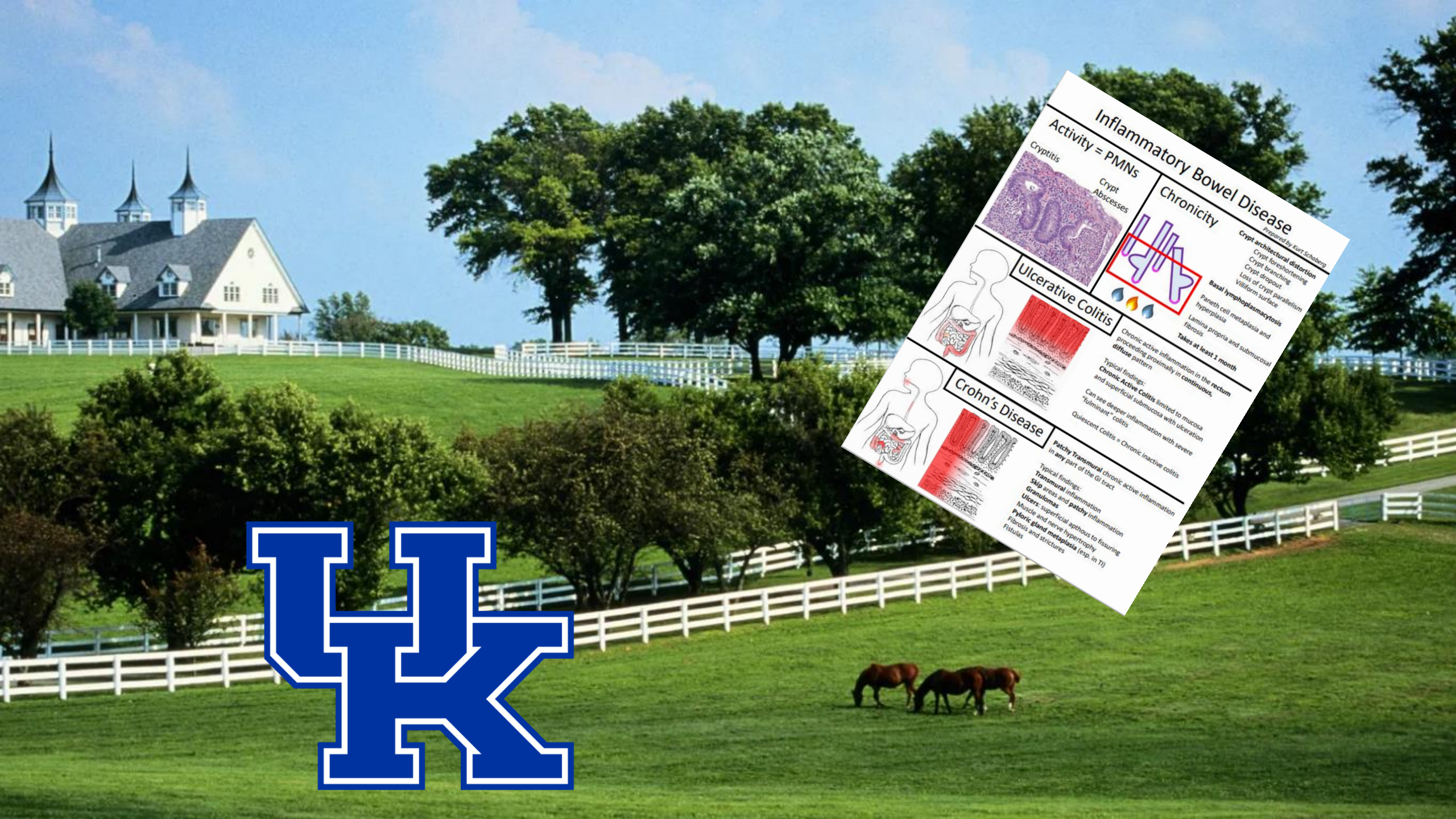
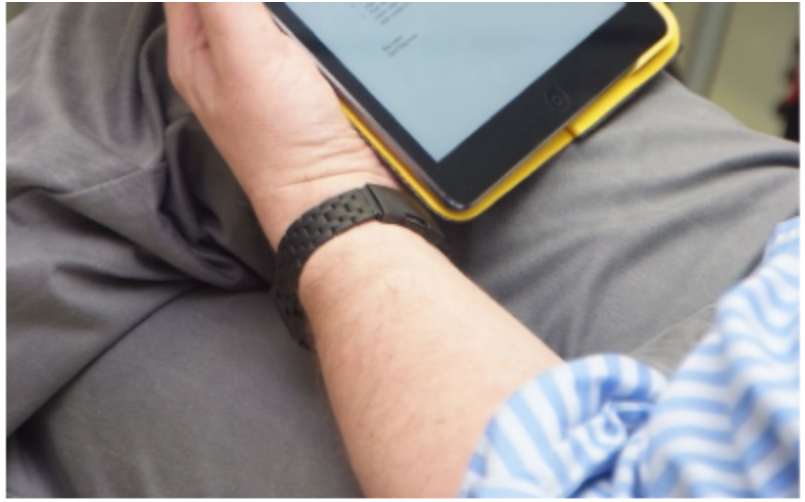
single cells
Comedocarcinoma with central necrosis


Inflammatory Bowel Disease
Prepared by Kurt Schoberg
Activity = PMNs
Cryptitis
Crypt Abscesses
Chronicity
Crypt architectural distortion
Crypt foreshortening
Crypt branching
Crypt dropout
Loss of crypt parallelism
Villiform surface
Basal lymphoplasmacytosis
Paneth cell metaplasia and hyperplasia
Lamina propria and submucosal fibrosis
Takes at least 1 month
Ulcerative Colitis
Chronic active inflammation in the rectum proceeding proximally in continuous, diffuse pattern
Typical findings:
Chronic Active Colitis limited to mucosa and superficial submucosa with ulceration
Can see deeper inflammation with severe "fulminant" colitis
Quiescent Colitis = Chronic inactive colitis
Crohn's Disease
Patchy Transmural chronic active inflammation in any part of the GI tract
Typical findings:
Transmural inflammation
Skip areas and patchy inflammation
Granulomas
Ulcers: superficial apthous to fissuring
Muscle and nerve hypertrophy
Pyloric gland metaplasia (esp. in TI)
Fibrosis and strictures
Fistulas



Handouts 2.0: enhanced capabilities and continued relevance

Kurt Schaberg

Department of Pathology and Laboratory Medicine, University of Kentucky Medical Center, Lexington, Kentucky, USA

THE CLINICAL TEACHER 2019; 16: 636–638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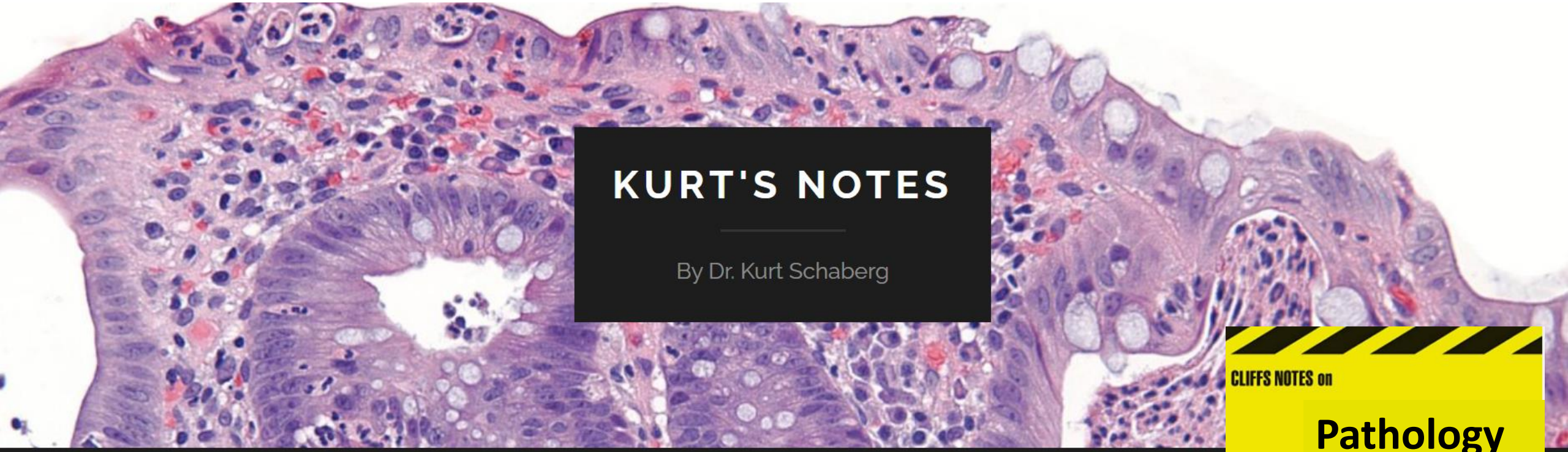
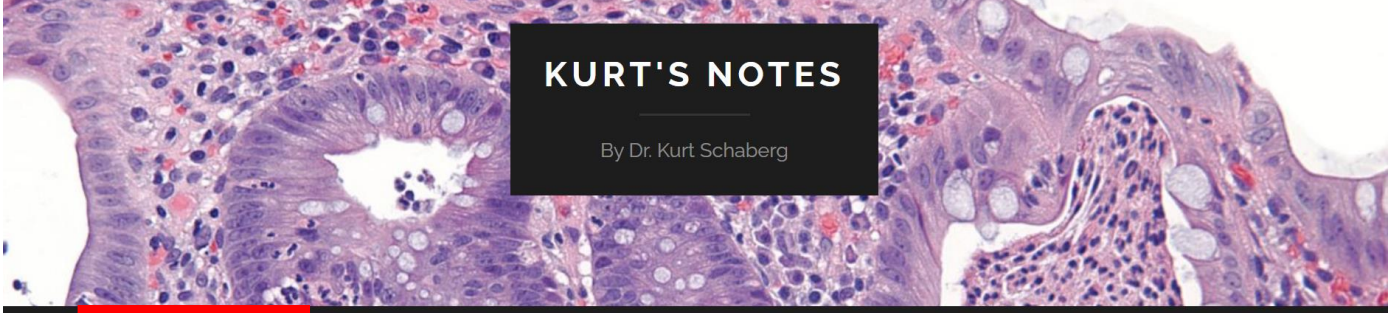


http://kurtsnotes.net/



KURT'S NOTES

By Dr. Kurt Schaberg

>740 pages of guides

DIAGNOSTIC GUIDES | REPORTING DIAGNOSES & COMMENTS | QUIZZES | ABOUT ME | LINKS | ARTICLES | BOOKS

Last updated: 9/22/2020

Prepared by Kurt Schaberg MD

Prostate Tumors

Acinar Adenocarcinoma

(The most common/default type of "Prostate Cancer")

An invasive adenocarcinoma consisting of neoplastic prostatic epithelial cells with secretory differentiation arranged in a variety of patterns, typically without basal cells.

Most common cancer in men and second leading cause of cancer death in the U.S.A.

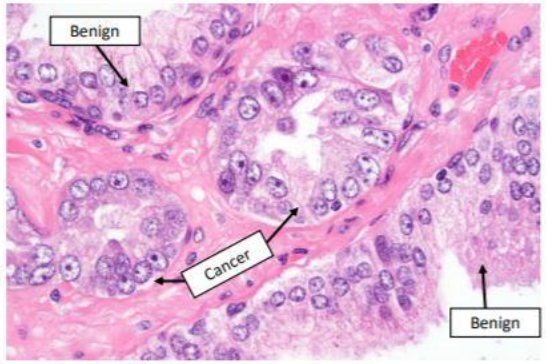
Prevalence is strongly correlated with age (older = higher prevalence)
Majority are **multifocal**, often with 2-3 separate tumors in each prostate.
Most commonly located in **posterior/posterolateral peripheral** gland.
Early tumors are often asymptomatic. Locally advanced prostate cancer mimics BPH with urinary symptoms. Bone very common site of metastasis → bone pain and pathologic fractures

Morphology: Always use *multiple* features (there is no single feature to Dx!)

Nuclear Features:
- Prominent nucleoli
- Nuclear enlargement
- Nuclear hyperchromasia
- Mitotic figures
- Apoptotic bodies

Cytoplasmic features:
- Amphophilic cytoplasm
- Sharp luminal borders

Luminal contents:
- Blue-tinged mucin
- Pink amorphous secretions
- Crystalloids

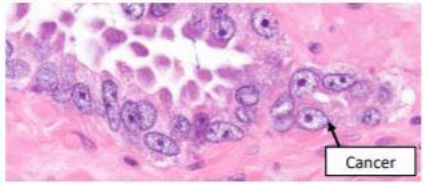


Architecture:
- Crowded small glands
- Linear row of atypical glands spanning the width of a core
- Small glands on both sides of a benign gland
- Haphazard, infiltrative pattern

Absent basal cell layer (can highlight with IHC, as fibroblasts may mimic basal cells)

Usually lack desmoplastic stroma. When present, often associated with high-grade carcinoma.

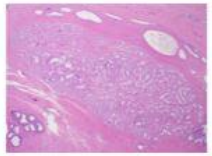
Findings more common in benign glands:
- Atrophic cytoplasm
- Merging with benign glands
- Corpora amylacea
- Inflammation
- Lipofuscin

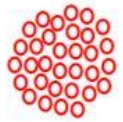


Gleason Grading

Based on architecture at low power (using 4x or 10x objective).

1

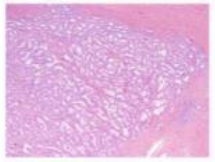




Circumscribed nodule of closely packed but separate, uniform, rounded to oval, medium-sized acini

Should **not** be diagnosed regardless of the type of specimen, with extremely rare exceptions

2

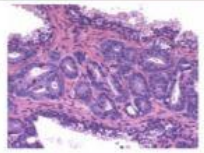


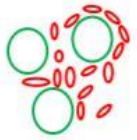
Fairly circumscribed, yet at the edge of the tumor nodule there may be minimal infiltration

Do not diagnose on biopsy, rarely diagnosed regardless of specimen.

Glands are more loosely arranged and not quite as uniform as Gleason pattern 1

3

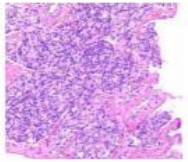




Well-formed glands ***(with lumina)***
Separate, discrete, Non-fused

Infiltration

4

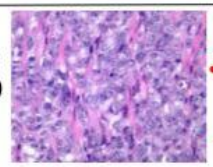


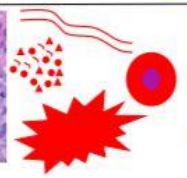
Ill-defined, poorly formed glands
Gland fusion
ALL cribriform glands
Hypernephromatoid
Glomerulations

Ductal Adenocarcinoma (without necrosis)

Often Disqualifies from Active Surveillance

5





Essentially **no glandular differentiation:**
- Solid sheets
- Cords
- Single cells
- Linear arrays

Comedocarcinoma with central necrosis

Notes: Given the importance of distinguishing between patterns 3 and 4 for active surveillance, getting levels can be helpful to differentiate tangential sectioning of small well-formed glands (pattern 3) from poorly-formed glands (pattern 4).

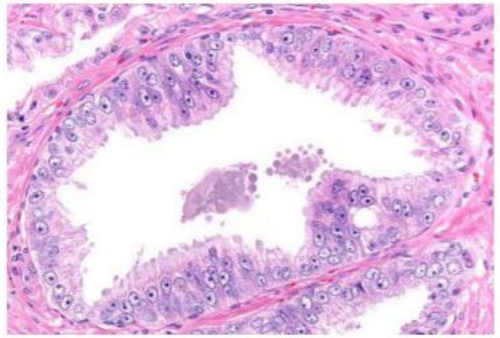
Intraductal Tumors

Non-invasive tumors growing within ducts

High-grade Prostatic Intraepithelial Neoplasia ("HGPIN")

Pre-invasive neoplastic proliferation.
Often multifocal.

Cytologic changes resembling cancer:
- **Nuclear enlargement**
- **Prominent nucleoli**
- **Hyperchromasia**
- **Clumped chromatin**



Although non-invasive, basal cells may be patchy (so be careful interpreting IHC!)

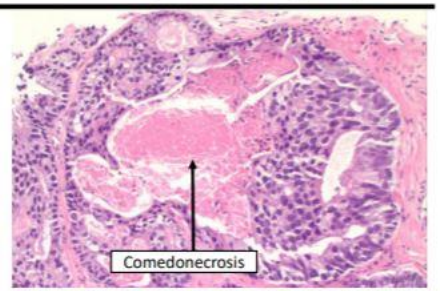
Four main architectures: tufting, micropapillary, cribriform, and flat

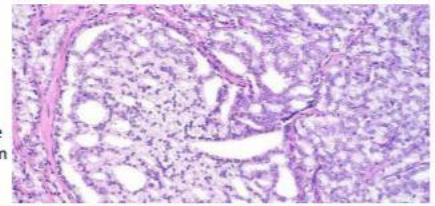
Often cytoplasmic AMACR staining

Clinical importance: associated with subsequent detection of cancer (more HGHPIN→ higher risk)

Intraductal Carcinoma

Diagnostic requirement:
Malignant epithelial cells filling large acini and prostatic ducts, with preservation of basal cells with either:
- Solid or dense cribriform pattern, or
- A loose cribriform or micropapillary pattern with either:
  - Marked nuclear atypia (nuclei 6x normal or larger)
  - Comedonecrosis



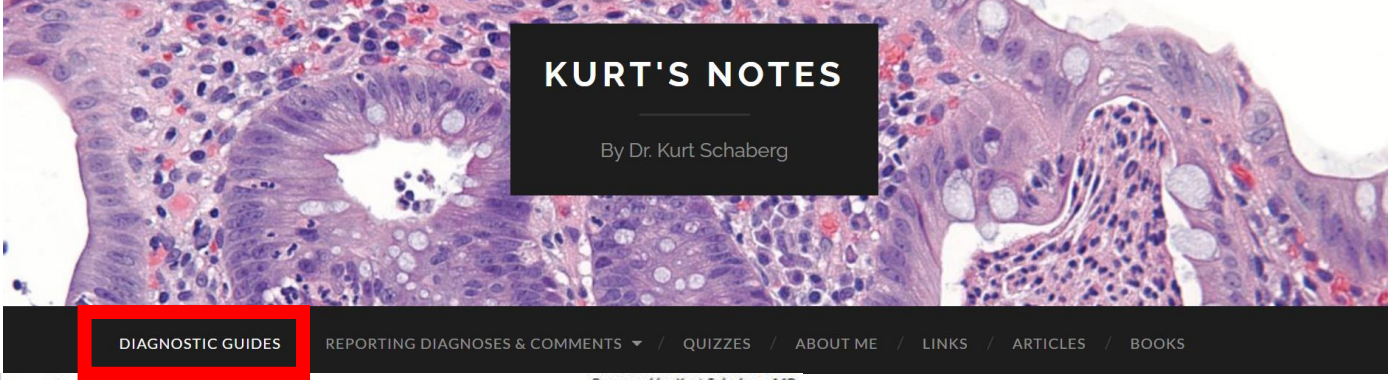


Can be seen in two scenarios:
1) Intraductal spread of a high-grade invasive cancer (majority of cases)
2) Distinct precursor lesion (separate from HGPIN) with high risk of progression to cancer

IHC often required for diagnosis to demonstrate basal cells. Can show loss of PTEN (rarely seen in HGPIN)

If seen on biopsy→ often treat with radical prostatectomy as highly associated with cancer and multiple adverse factors (high Gleason grade, high tumor volume, etc..). Sometimes repeat biopsy immediately.

If a lumen-spanning atypical lesion morphologically falls short of Intraductal Carcinoma, best to call "***Atypical Intraductal Proliferation***" and recommend immediate repeat biopsy.



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Last updated: 9/22/2020 *Prepared by Kurt Schaberg MD*

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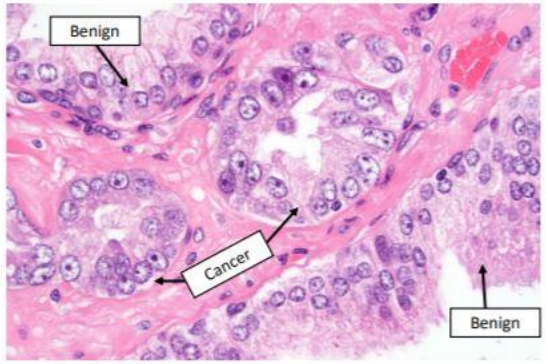

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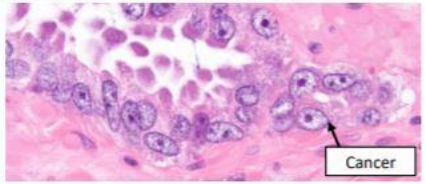
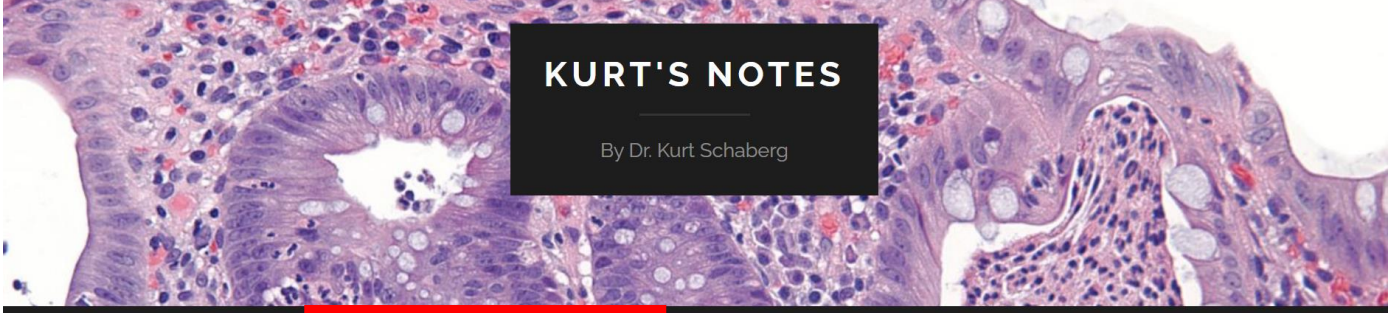


Dual/Competing Goals

- **Boards studying**
  - Concise, High-yield
- **Useful at the scope daily**
  - Reference for common problems



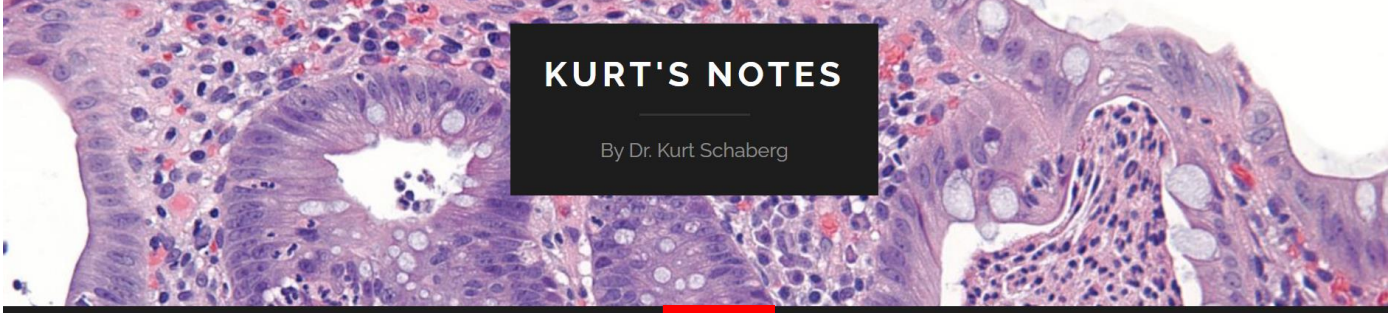
Stomach

– Mild chronic gastritis

– Chronic active gastritis

– Helicobacter organisms identified

– Reactive (chemical) gastropathy



Quizzes

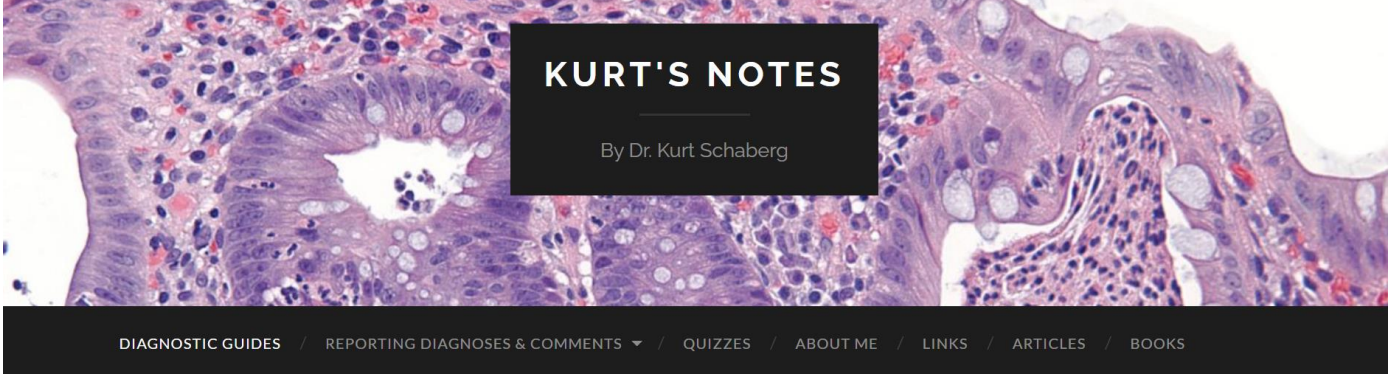
Here are some practice quizzes that I've made using the amazing PathPresenter website:

Practice Board Exams (1/2 Length):

Multiple choice, like the boards. Record your diagnoses on the website, which will grade your answers when you're done. You can then review your selections with the answer sheet after submission to see the answers to the questions you got wrong.

The real AP boards slide exam is 85 slides, for which you have 3.75 hours, so for each 43 question practice test, you should finish in a little less than 2 hours to be "on pace" for the real thing. Or, of course, you could try to do both in 3.75 hours.

Exam #1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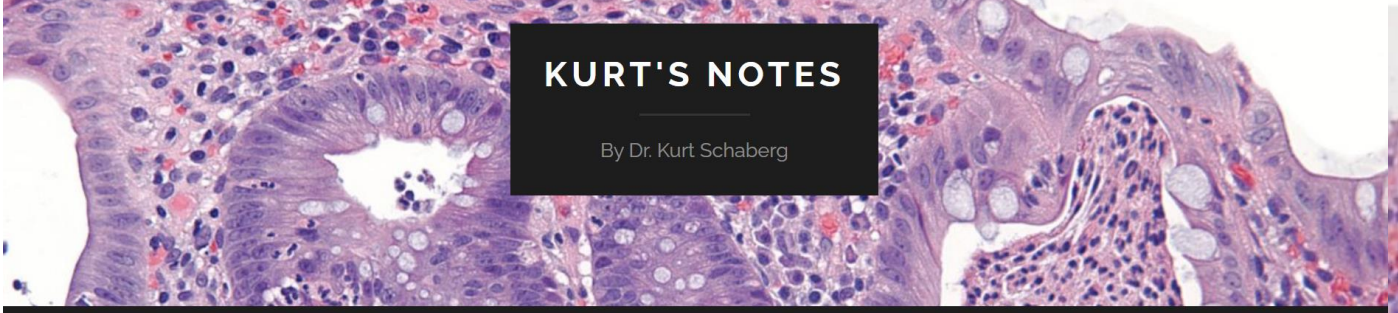
Analytics


Users
1,000
500
2020
2021



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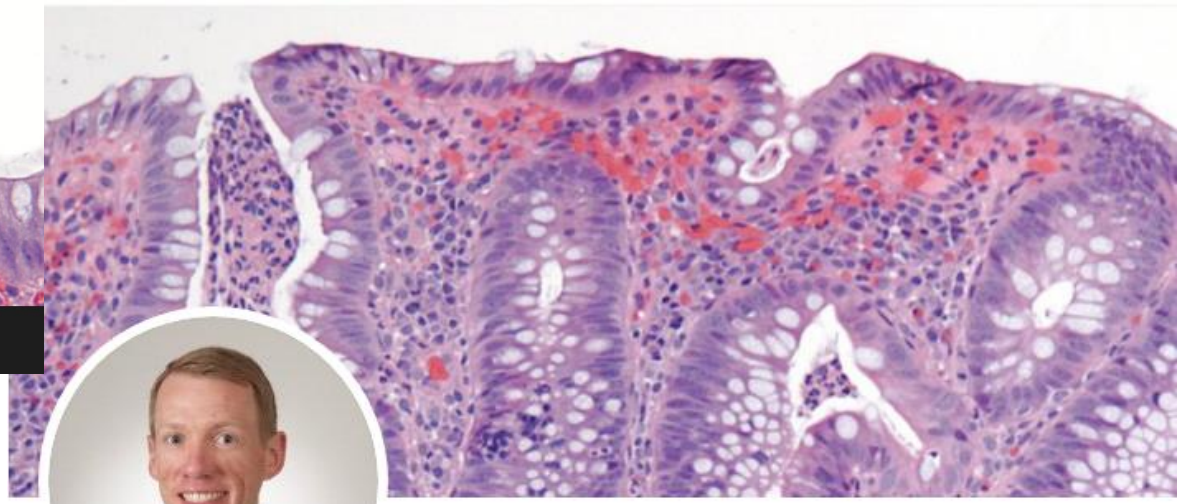

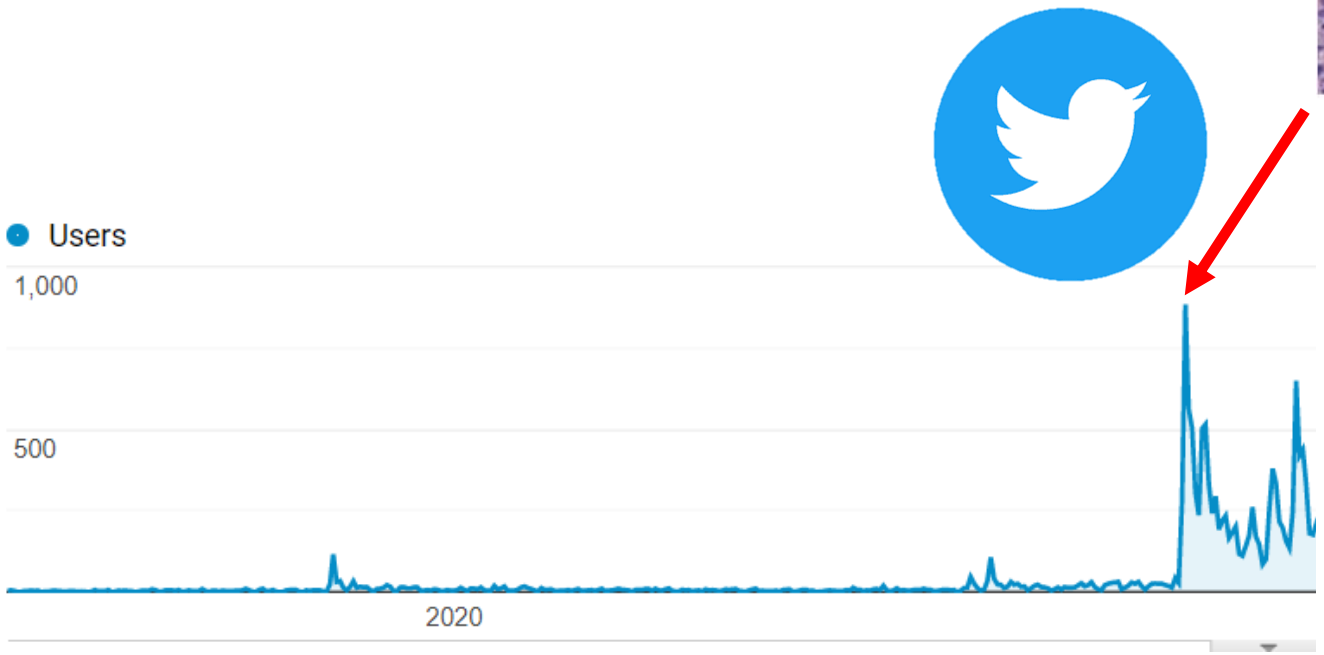

Kurt Schaberg
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Associate Residency Program Director
Specializing in GI surgical pathology and cytopathology

Sacramento, CA kurtsnotes.net Joined January 2020

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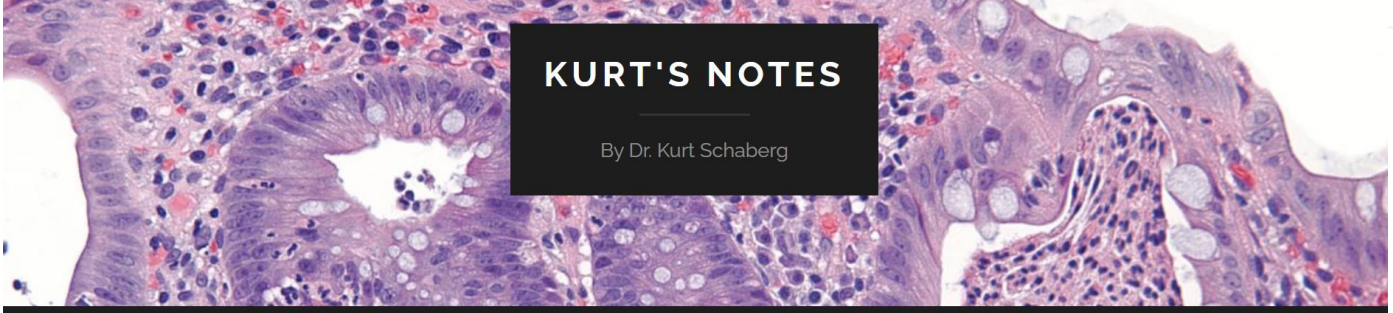

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Karamatullah Danyal MD PhD @KDanyal · Mar 5
Replying to @KurtSchaberg @VHNguyenMD and 3 others
Thank you so much. I utilized your notes my entire surgical pathology rotation. Even took printouts to sign out to defend my diagnoses. Amazingly helpful.
2

Van-Hung Nguyen, MD FRCPC @VHNguyenMD · Mar 4
Replying to @KurtSchaberg @SteveLongMD and 2 others
WOW! @McgillPathRes
2

Leo Yenwongfai, MD, MS @Leonard37319543 · Mar 7
Replying to @KurtSchaberg @VHNguyenMD and 3 others
Thank you
1

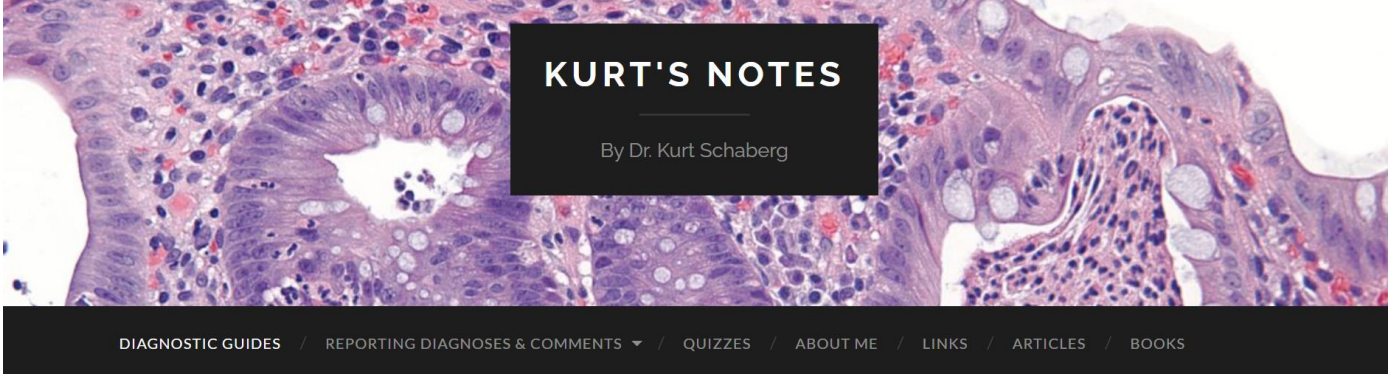
Olaleke Folaranmi @DrGeeONE · Aug 11
Replying to @KurtSchaberg
#PathTweetAward
1
3

Van-Hung Nguyen, MD FRCPC @VHNguyenMD · Aug 11
+1 🙌🙌🙌
2

Pembe Oltulu, MD @pembeoltulu · Aug 12
Replying to @KurtSchaberg
#pathtweetaward⭐
2

Josh Segal, MD @jsegalurmc · Aug 10
Replying to @KurtSchaberg
these are fantastic kurt, thank you!
1
2

Kurt Schaberg @KurtSchaberg · Aug 10
Thanks Josh!😎



Analytics

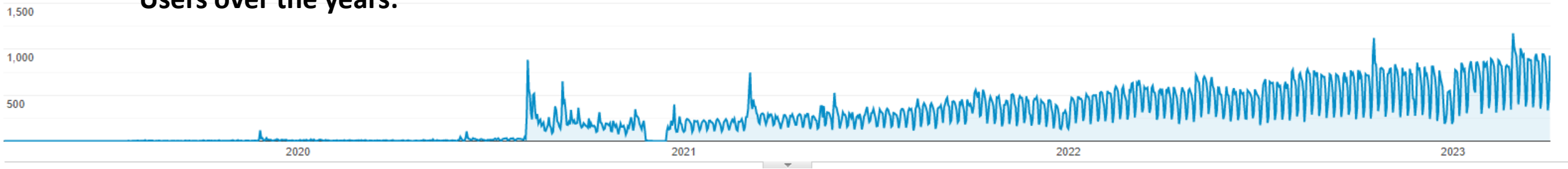
Overview

Users vs. Select a metric

Hourly Day Week Month

Users

Users over the years:



Overview

Users in a week:

Users vs. Select a metric

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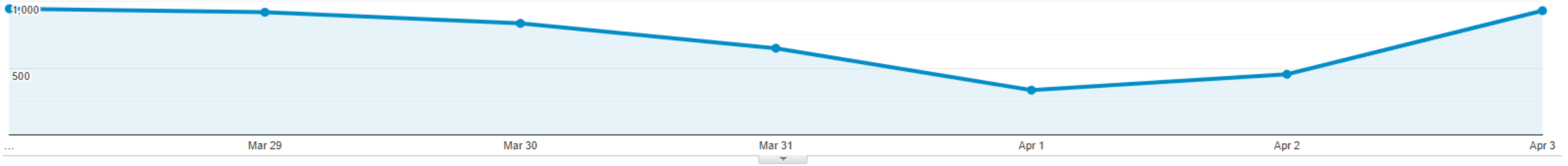

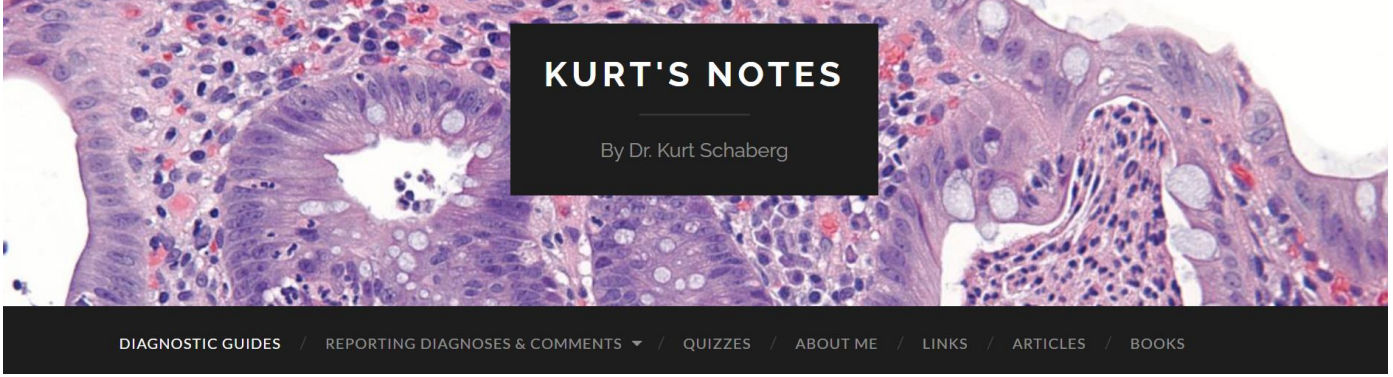

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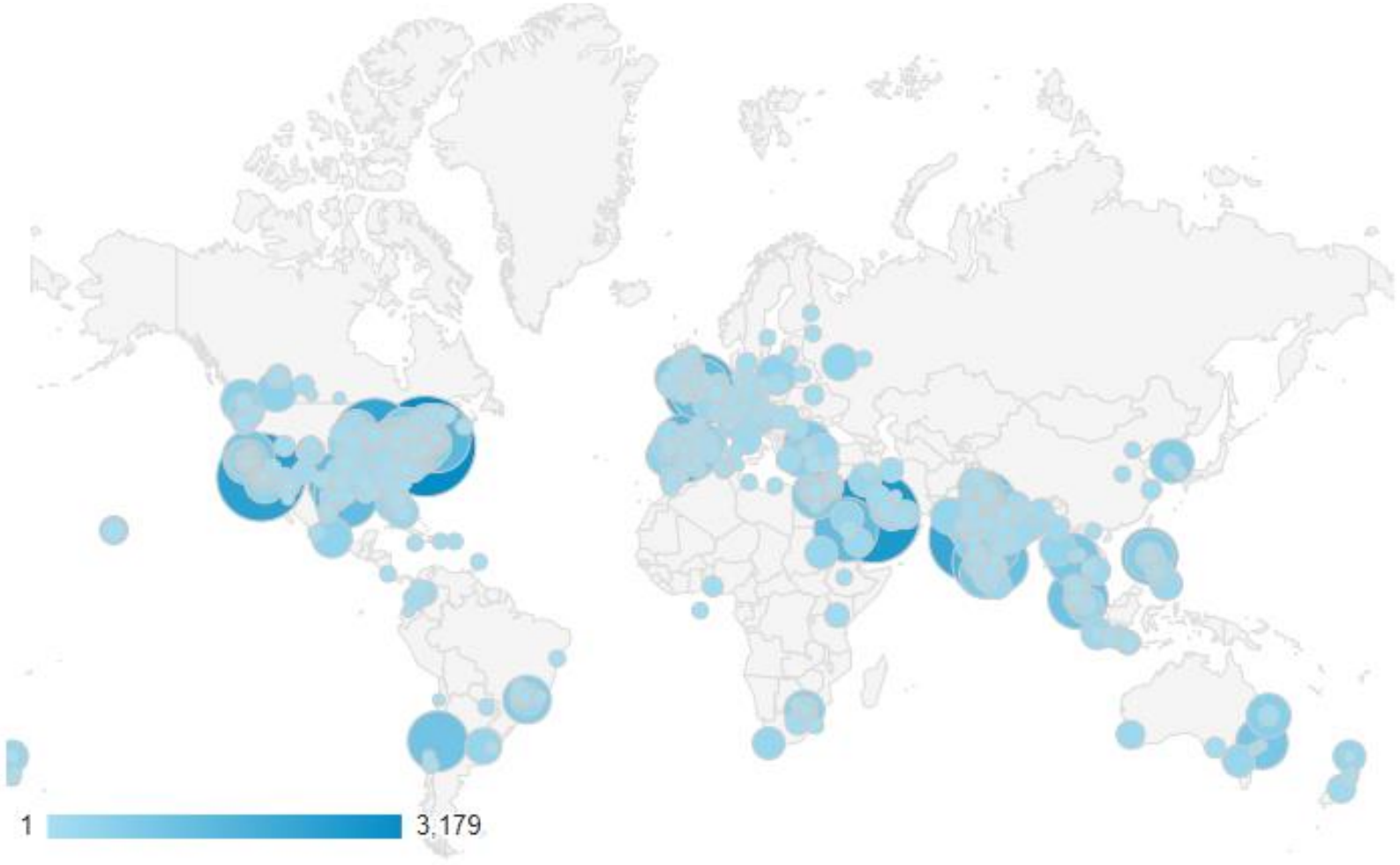
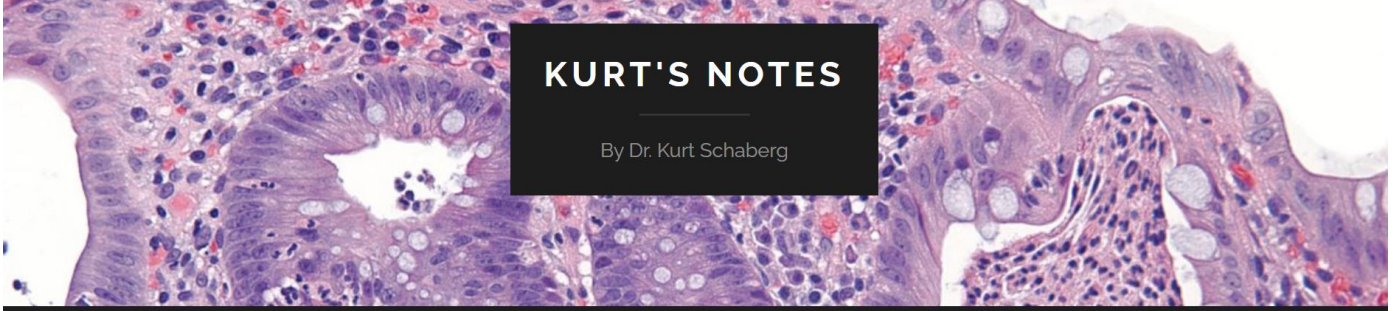
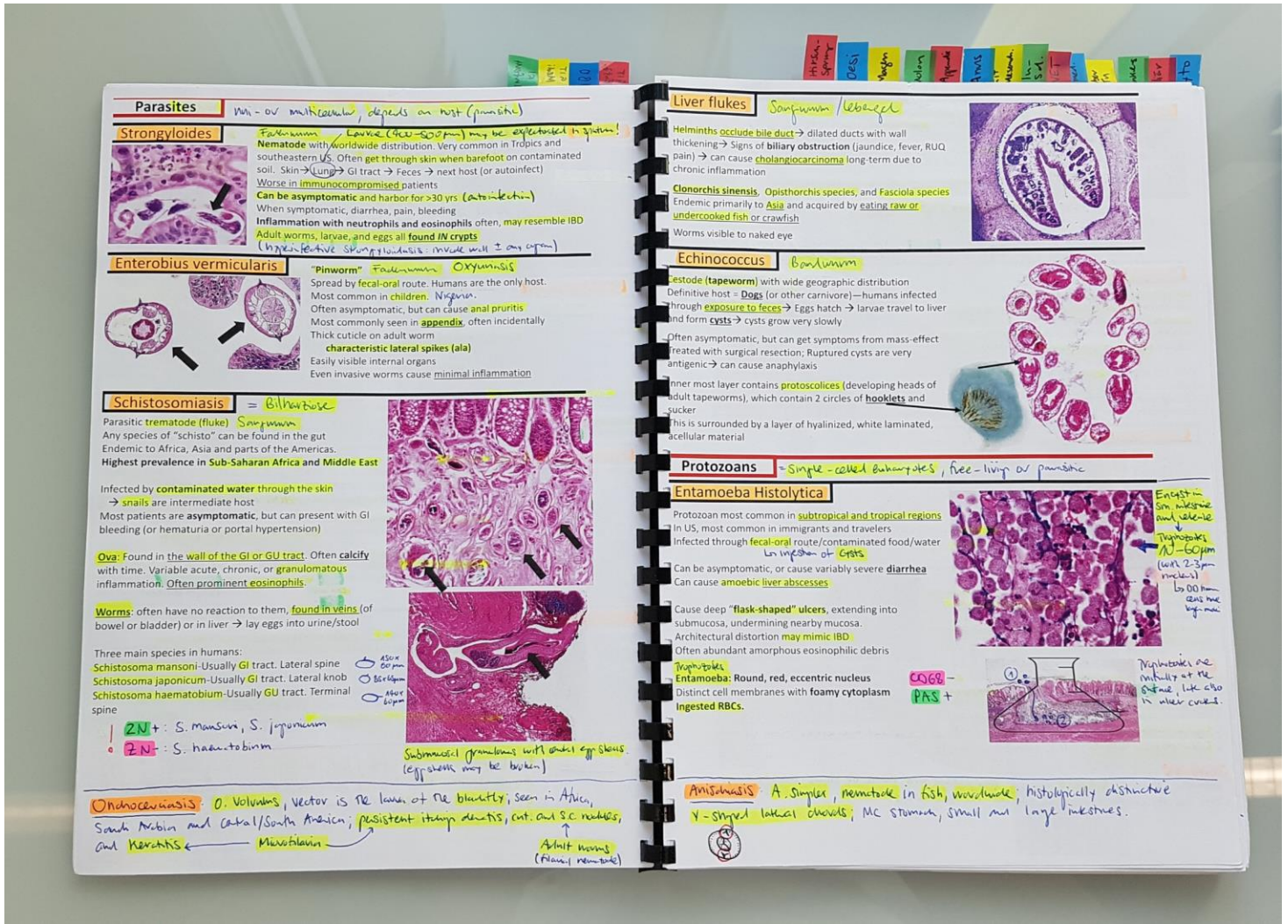


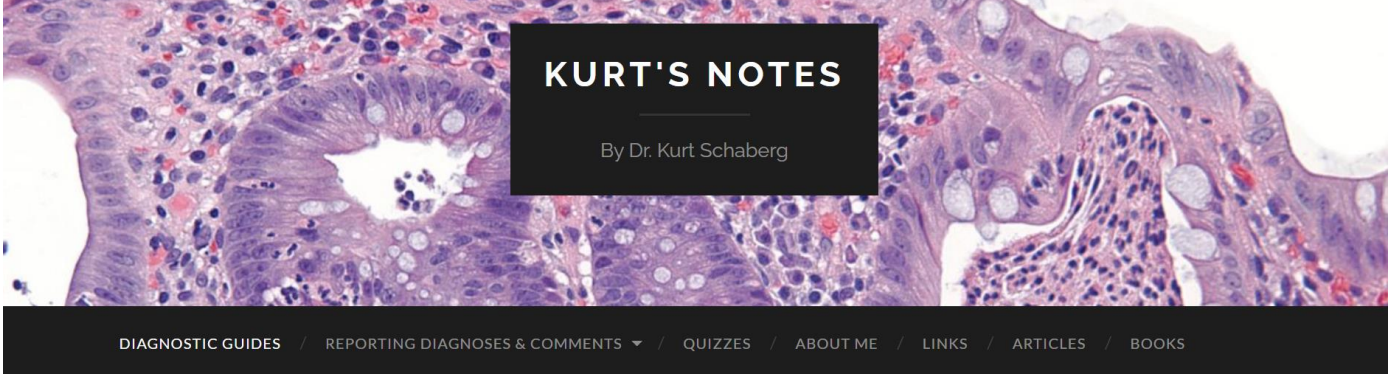
Top Cities:

1.	(not set)
2.	New York
3.	London
4.	Riyadh
5.	Los Angeles
6.	Chicago
7.	Mumbai
8.	Bengaluru
9.	Madrid
10.	Boston





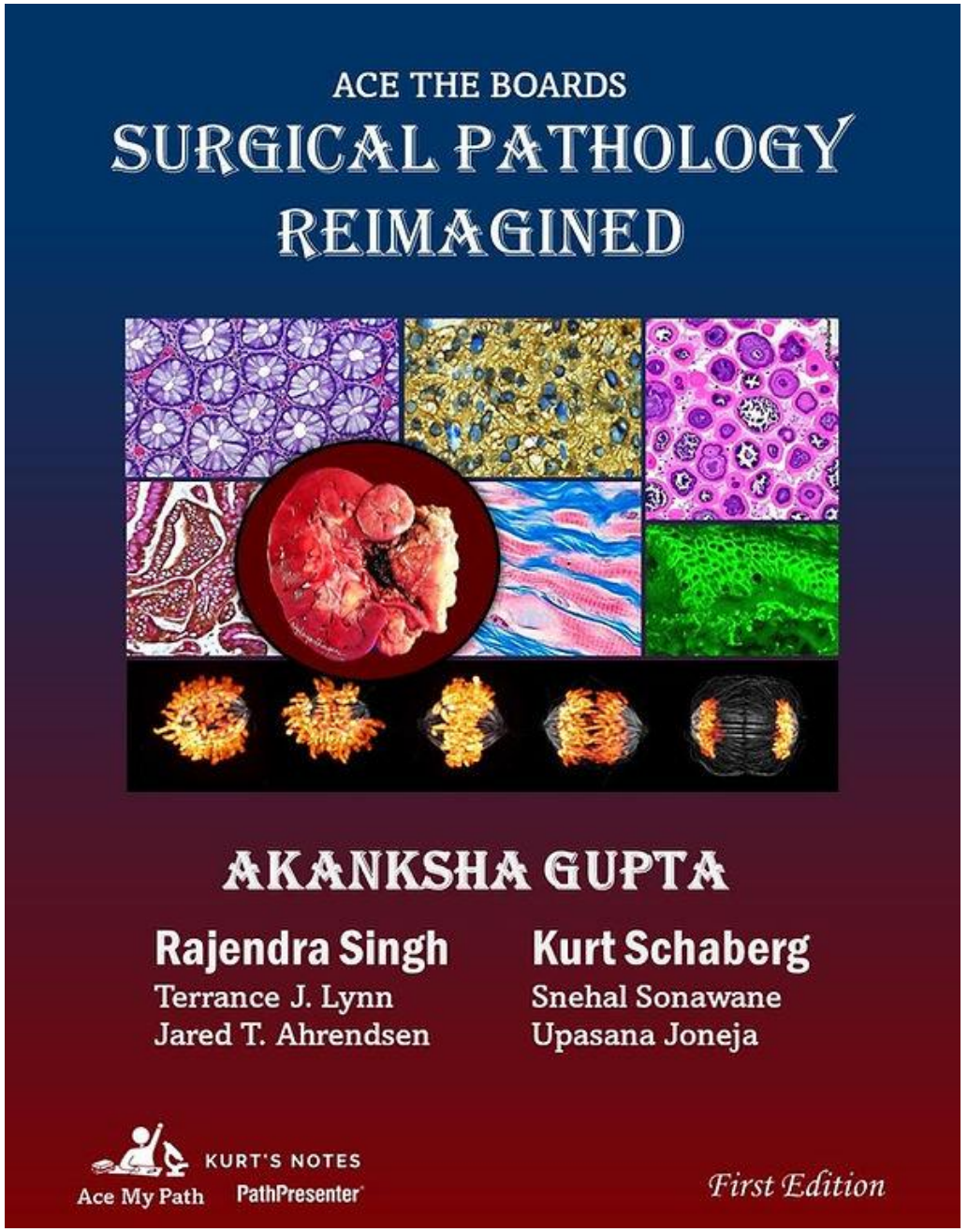
"That is very good."



Anki Flashcards

SYNAPTIQ

The Flashcard Platform for Medical Education



Outline

- For the PGY1-2's: Talk about basic strategies for learning AP
- For the PGY3-4's: Talk about the boards (format, content, ways/resources to study)

What is this based on?

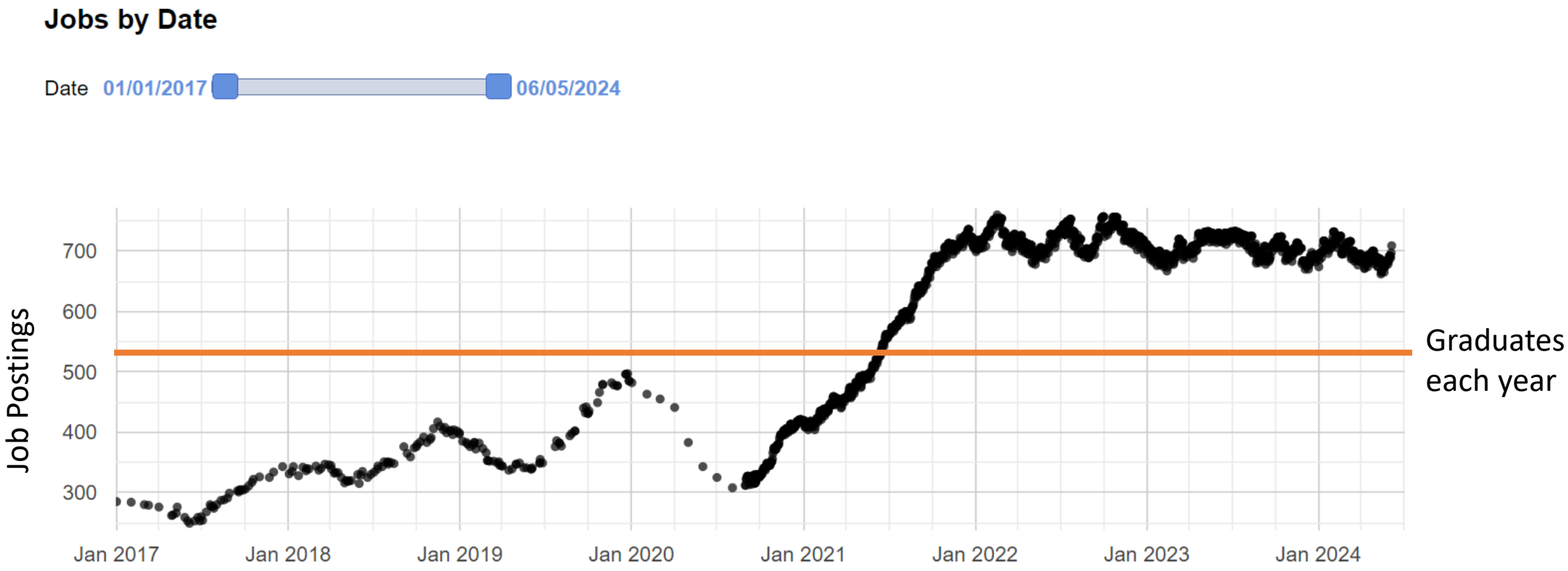
- The ABP website
- My own experience (in person)
- Lectures during my residency
  - Particularly a talk on “Learning Anatomic Pathology” by Drs. McKenney and Jensen
- Social media
- Feedback from my residents
- CAP survey, “Almost Everything You Wanted to Know About Pathology Board Exams but Were Afraid to Ask”
- Emailing the ABP

My Residency

Two things residents always worry about

1. Getting a job
2. The Boards

Getting a job



Source: https://www.pathologyoutlines.com/jobs

You *will* get a job!

Two things residents always worry about

1. ~~Getting a job~~
2. The Boards

What I heard about boards when I was a resident

- It’s really hard
- The pictures are terrible
- It’s random esoteric trivia
- It’s not practical
- You have to “read their minds”
- There’s no way to know what they’ll test you on

My thoughts walking out of the test center

- Phew!
- That wasn’t as scary as I feared
- I think I probably passed
- It was mostly fair
- I didn’t know everything, but I recognized most things

Candidate Examination Preparation: Do's and Don'ts

A Few Words from ABPath CEO Gary Procop, MD, MS, MEd

As we gear up for the upcoming board certification exams, I wanted to take a moment to offer some valuable tips on how to prepare. While I'll certainly be citing reliable references to support my suggestions, I'll also add a dash of common sense—something we're all familiar with, yet occasionally overlook in the heat of exam prep. Let's dive in and ensure you're ready for success on exam day.

Keep It Simple

I am very proud that, for as long as I've been associated with the ABPath, there has been a sustained and concerted effort to not accept items (i.e., test questions) that concern trivia or minutia. The items that are accepted have been reviewed and edited by groups of subspecialty experts in the various areas of Pathology and Laboratory Medicine with the charge to only include medically important and clinically relevant information. Therefore, study what you need to know and be able to do to succeed as a pathologist in practice as a means to do well on the certification examination.

Use the Guide

Use the blueprints on the ABPath website to help guide your studies. The blueprints show the rough percentage of the examination that is covered by each content area, as well as the distribution of written items, practical items, and items that include virtual microscopy.

Think Big

When studying any one area of pathology (e.g., pulmonary pathology) there will likely be a spread of the type of material in any given category so read broadly. For example, items will likely not solely concentrate on neoplasia, but will likely also include inflammatory and infectious conditions, malformations, etc.

Source: https://abpath.org/a-few-words-from-abpath-ceo/

Building a Strong Foundation

- The best way to prepare for the boards is to **prepare for practice**!
  - **Study for Life**, not the test
  - Residency is an **apprenticeship**, not a class
  - Be **Engaged**

- You can't lean everything you need to know for boards in your last year.
  - Try to get the most out of *every rotation* and think critically about every case
  - Do *not* just be one of those residents that is "going through the motions"
  - Do *not* wait to figure out what something is at signout

- Try to treat every case as if it was ***your*** case


Studying for Practice
Studying for the Boards
Corporate needs you to find the differences between this picture and this picture.
They're the same picture.
imgflip.com

Building a Strong Foundation

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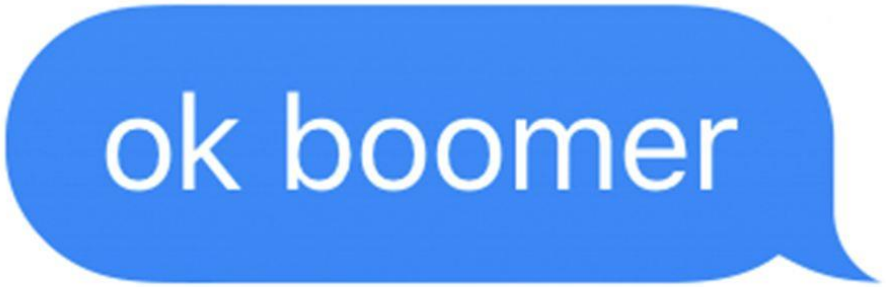
What you’re probably thinking ;-)



Millennial to Millennial/Zoomer

Millennial to Millennial/Zoomer

If you could offer one piece of advice to future test takers, what would it be?

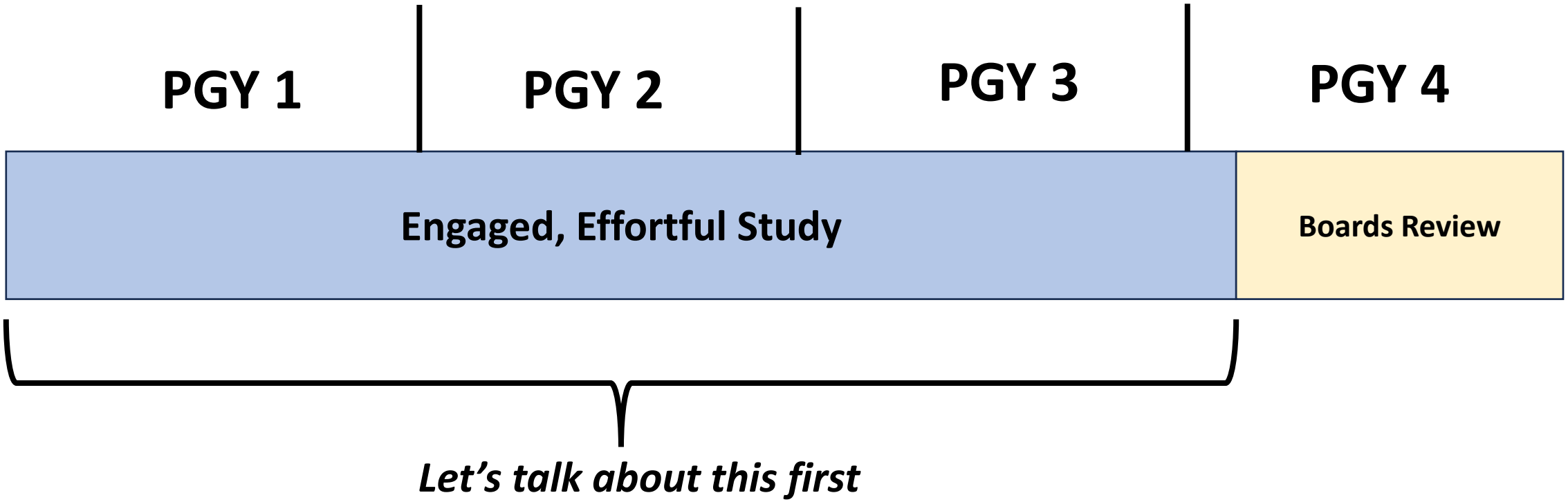
Learn material throughout residency:

- Learn as much as you can during your rotations
- Read about your cases
- Take your CP rotations seriously and get involved in lab management

Have a study plan and be committed to your plan:

- ~2 years in advance for rough preparation and give last 6 months for serious studies with timetable and topics to be read every day
- Start several months prior to the exam and study in small increments each day.
- Recognize your weaknesses and spend more time on those subjects.

Study timing



Engagement → “Effortful Study”

- How does one develop “expertise?”
- Why do some people spend the same number of years at a given activity (golf, chess, piano…), but have markedly different skills?
- **Time spent in *effortful* study**

What is “Effortful Study?”

What is *not* effortful study:

- listening to a didactic lecture
- picture flipping in a pathology book
- sitting at the scope with an attending
- googling a picture

What is “Effortful Study?”

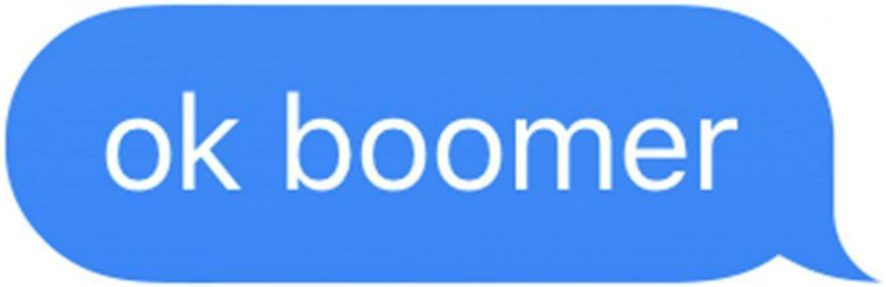
- Learning is not something done to students, but rather something that students *themselves* do

- Examples of effortful study (and engagement):
  - Previewing your cases in-depth
    - Having diagnoses and DDXs
    - Suggesting next steps in work-up
  - Previewing for Unknown sessions
  - Reading and quizzing yourself
  - Anki

What is “Effortful Study?”

- Residency is an apprenticeship, not a job or class!
- Just showing up and moving the cases along is NOT enough!

What you’re probably thinking ;-)



What you need to learn for AP (and how to study it)

- Disease Entities
- Morphology
- Special studies

Tested on the boards

- Grossing
- Reporting

Learning Disease Entities

- If you don’t know it exists, you can’t make the diagnosis!
- “List Learning”
  - Diagnosis lists
  - Clinical lists

PGY1 Diagnosis Lists

- Spindle cell neoplasm in the GI tract
  - GIST (Gastrointestinal Stromal Tumor)
  - Leiomyoma
  - Schwannoma

PGY4 Diagnosis lists

Benign/Non-aggressive

- Leiomyoma
- Schwannoma
- Mucosal Schwann cell hamartoma
- Perineurioma
- Ganglioneuroma
- Glomus Tumor
- Inflammatory fibroid polyp
- Lipoma
- Plexiform Fibromyxoma
- Calcifying Fibrous Tumor

Malignant/Potentially Aggressive

- GIST
  - SDH-deficient GIST
- Leiomyosarcoma
- Desmoid Fibromatosis
- Rhabdomyosarcoma
- Solitary Fibrous Tumor
- Inflammatory Myofibroblastic Tumor
- Kaposi Sarcoma
- Angiosarcoma
- Gastrointestinal Clear Cell Sarcoma

PGY4 Work-up lists

IHC Panels

First Round (most common DXs):

CD117 (ckit)
DOG1
} GIST

Desmin → Smooth Muscle tumors

S100 → Neural Tumors (and other, rarer, neural crest tumors)

Second Round (less common tumors):

EMA → Perineurioma

Nuclear β–Catenin → Fibromatosis

ALK → Inflammatory myofibroblastic tumor

Melan-A and HMB45 → PEComa

Calretinin, CD68 → Granular cell tumor

SMA → Myofibroblastic or muscle differentiation (or Glomus)

CD31 or ERG → Vascular tumors

CD34 → Vascular tumors, GIST, Inflammatory fibroid polyp, some NF cells

List Learning: Causes of “Diarrhea”

PGY1 list

- IBD
- Microscopic colitis
- Celiac disease
- “Infection”

PGY4 List

- IBD
- Microscopic colitis
- Ischemia
- Mediation-associated
- Eosinophilic gastroenteritis
- GVHD
- CVID
- Specific infections (e.g., MAI, EHEC)

List Learning

- Mass lesions for each organ
- Inflammatory disorders for each organ
- Etiologies for each clinical diagnosis

Active List Learning

- On your own: with each case you get
  - Don’t waste an opportunity
- Unknown conference
- Also know what it is *not*

If you’re never heard of it, you can’t diagnose it!

Studying During Residency

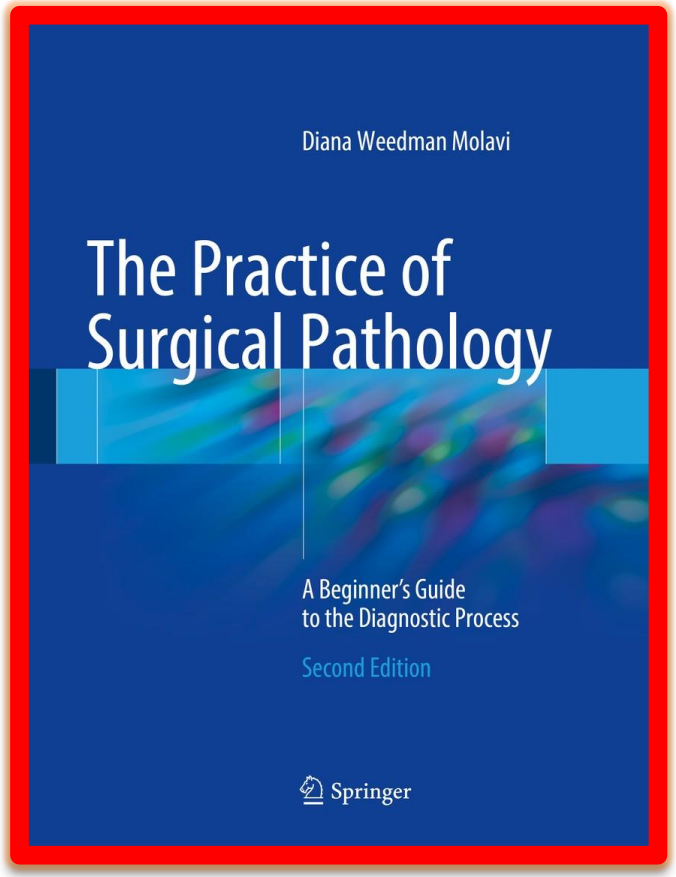
Holistic Studying

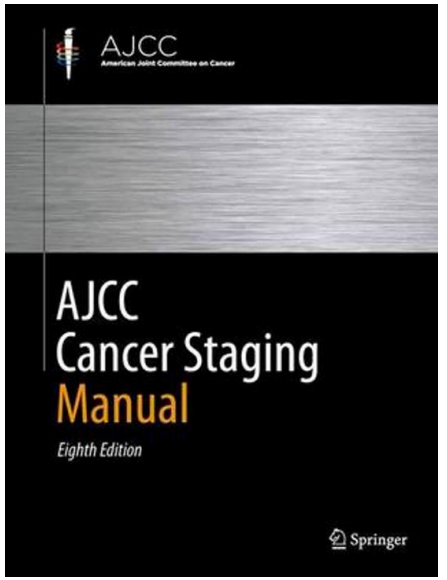
- Structured to cover ***all*** aspects of surgical pathology

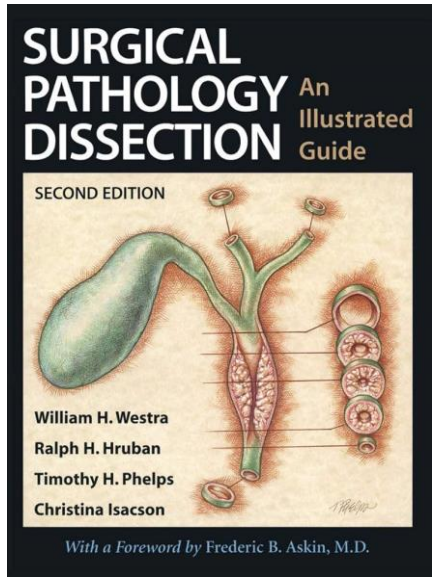
Case-specific

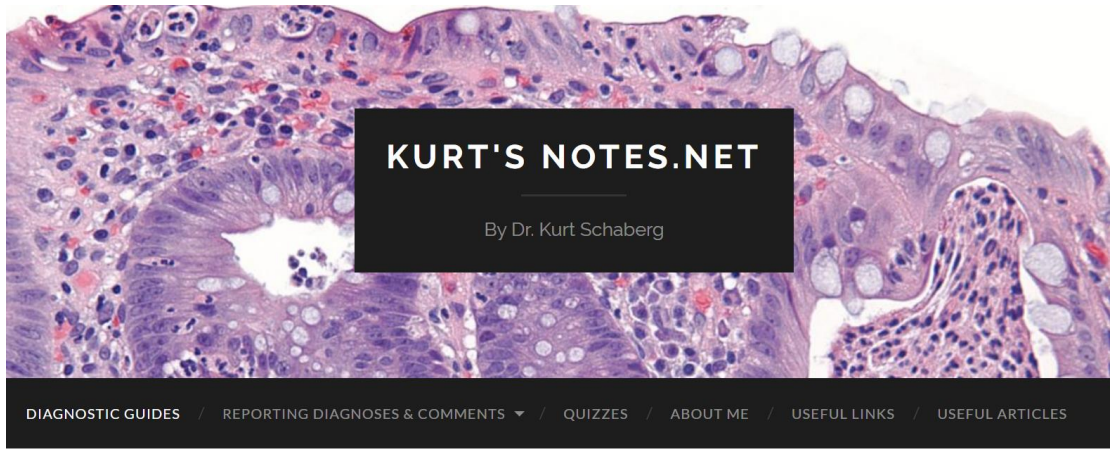
- Based on cases you encounter in daily practice

Holistic Studying Resources for First/Second Years

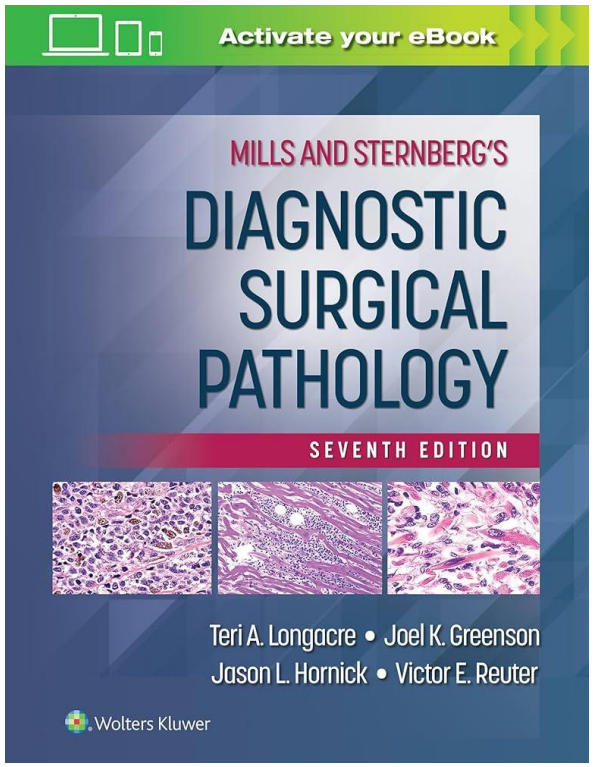


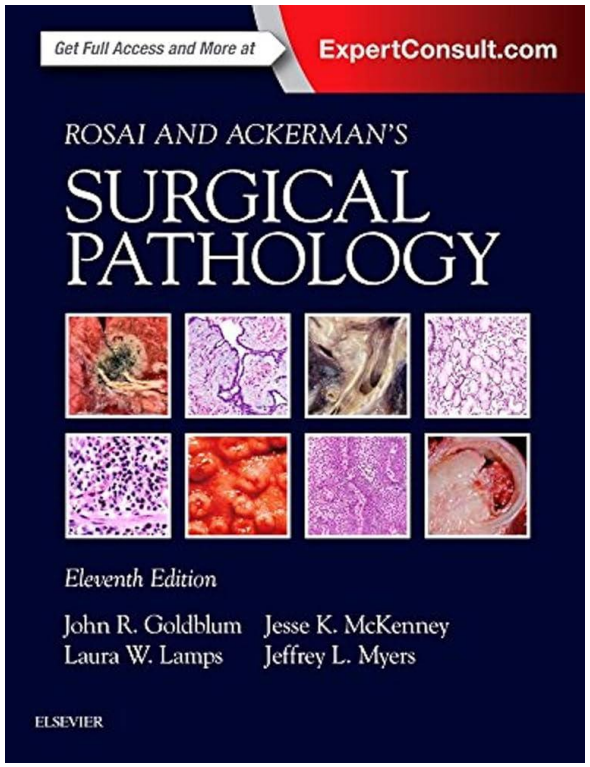


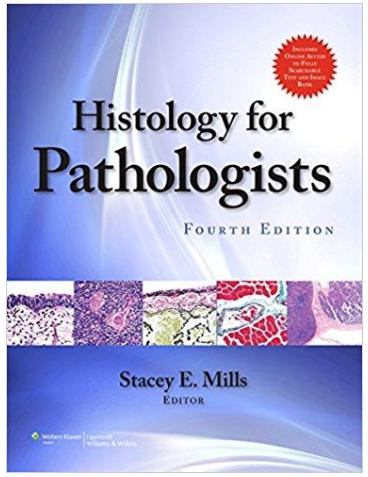


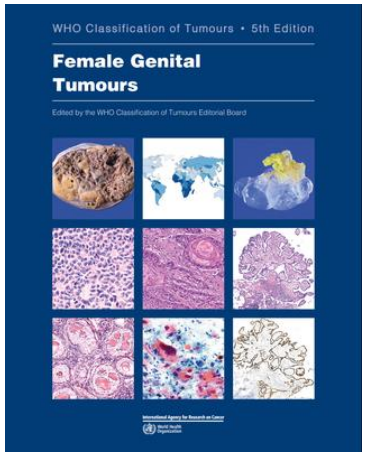


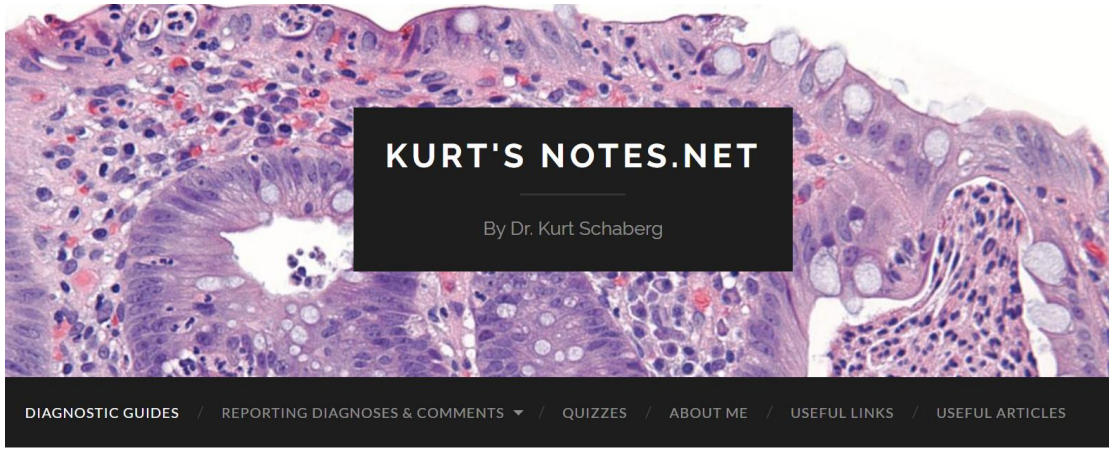
Holistic Studying Resources for Third/Fourth Years



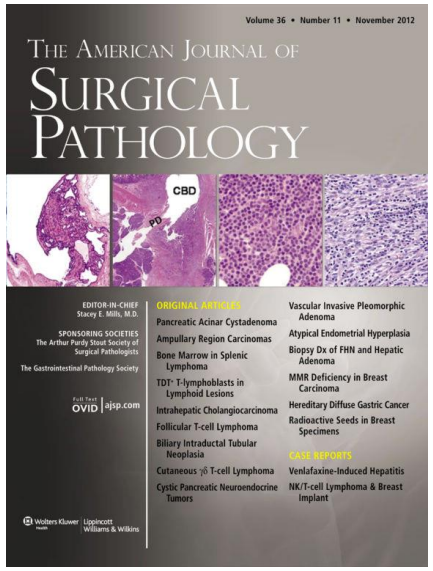


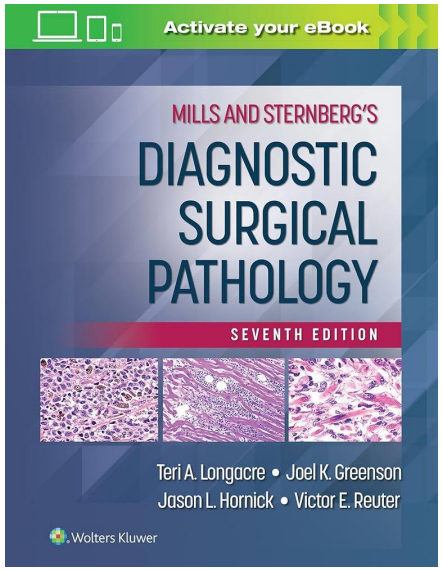


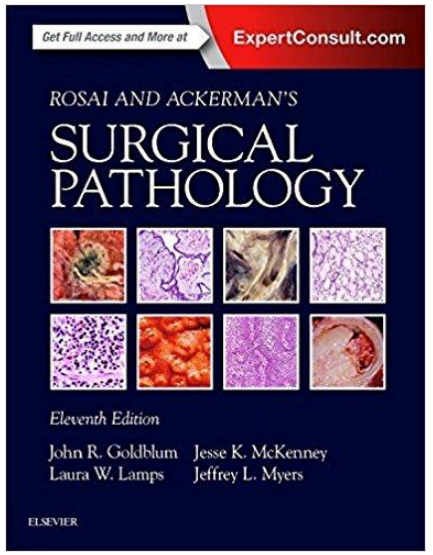


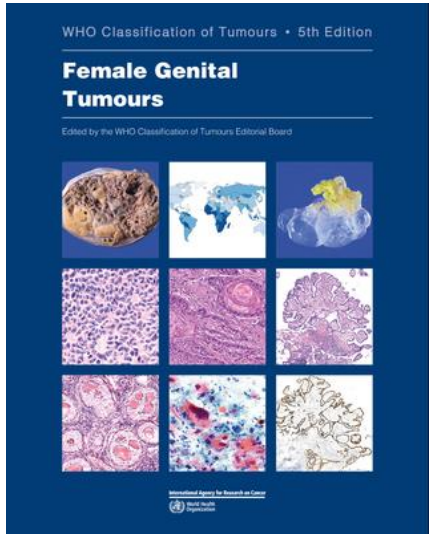


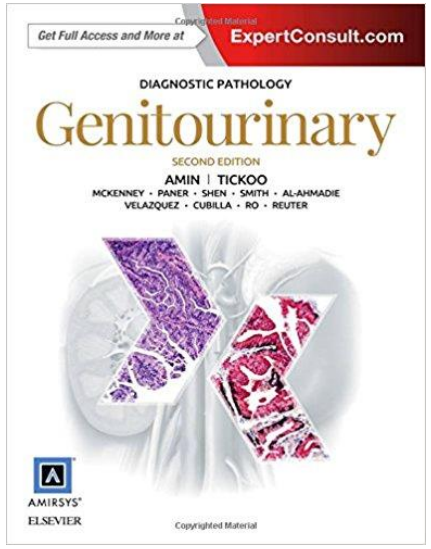
Case-specific Studying

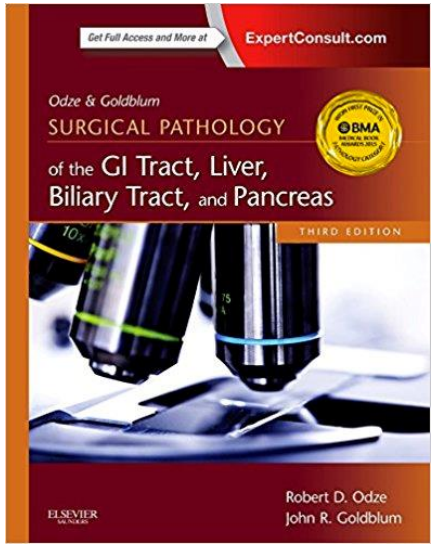












Studying During Residency

Holistic Studying

- Structured to cover ***all*** aspects of surgical pathology

Case-specific

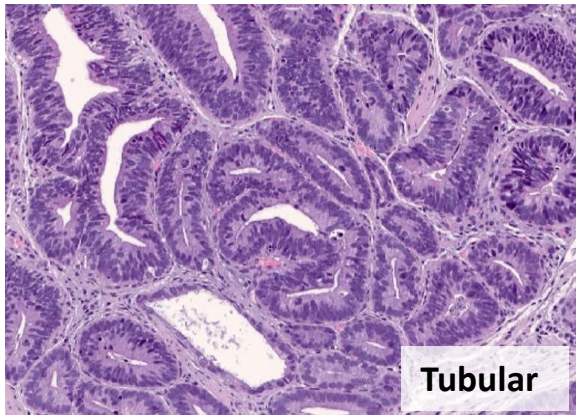
- Based on cases you encounter in daily practice

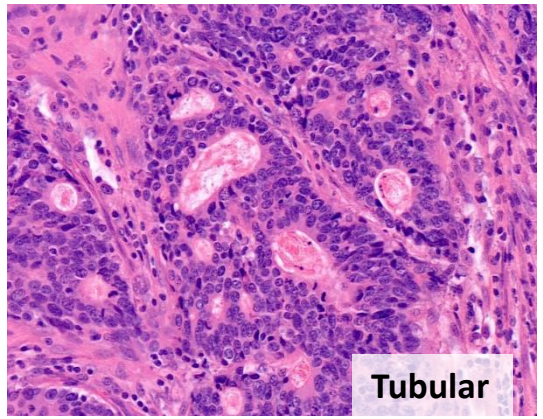
Morphology

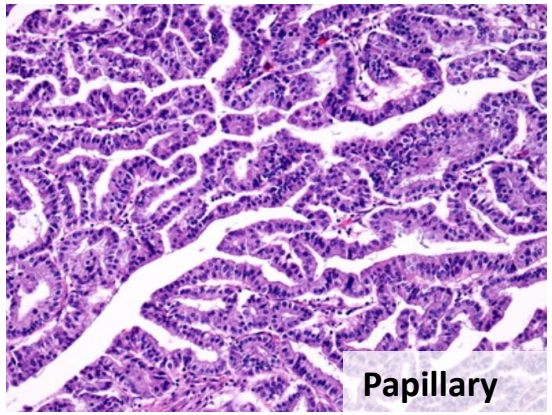
- First learning priority: classic histologic appearance of each disease entity
  - Be able to recognize the classic morphology as soon as possible
  - You don’t want to still be learning the classics in your last year, when you should be learning the morphologic spectrum or more esoterica
- Unfortunately, cases frequently stray from the classic look
  - Learn morphologic Heterogeneity
  - Learn morphologic Spectrum

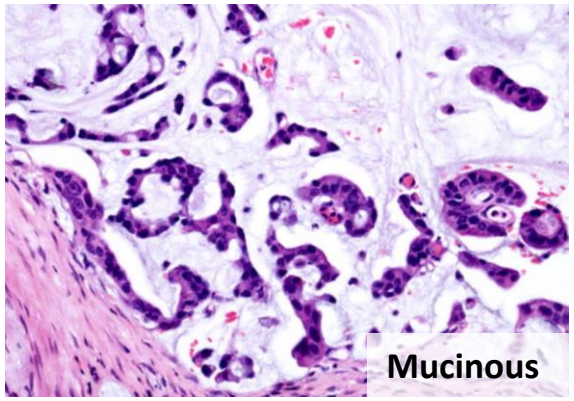
Gastric Cancer Morphologic Spectrum

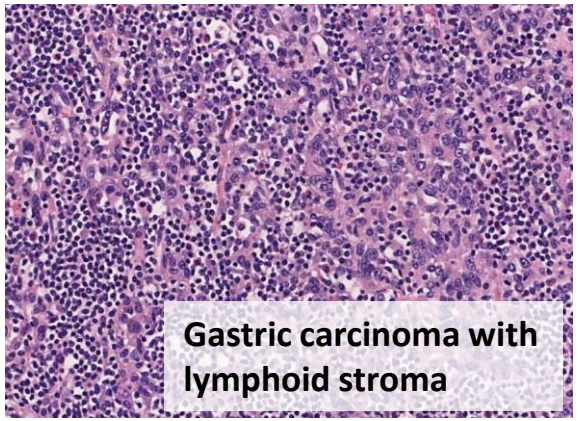
- As you advance and know the classic appearances, you will begin to learn the spectrum allowed for a diagnostic entity

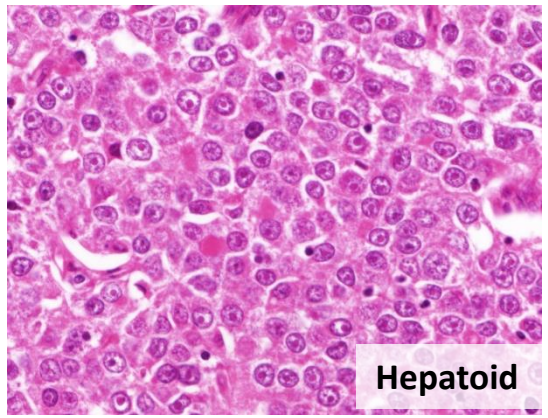


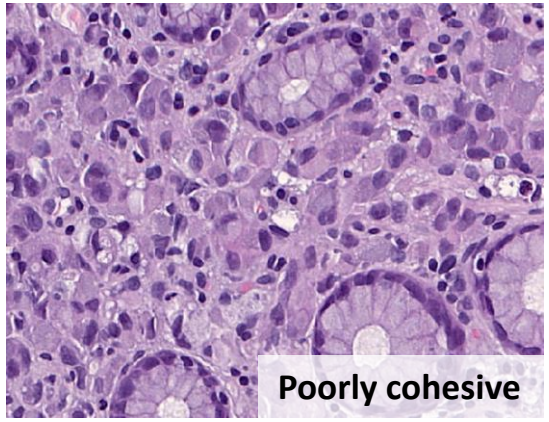


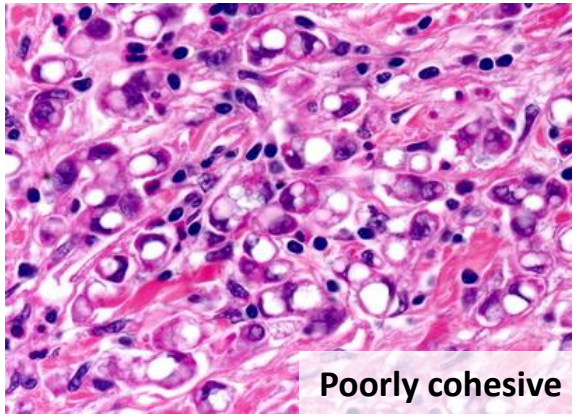










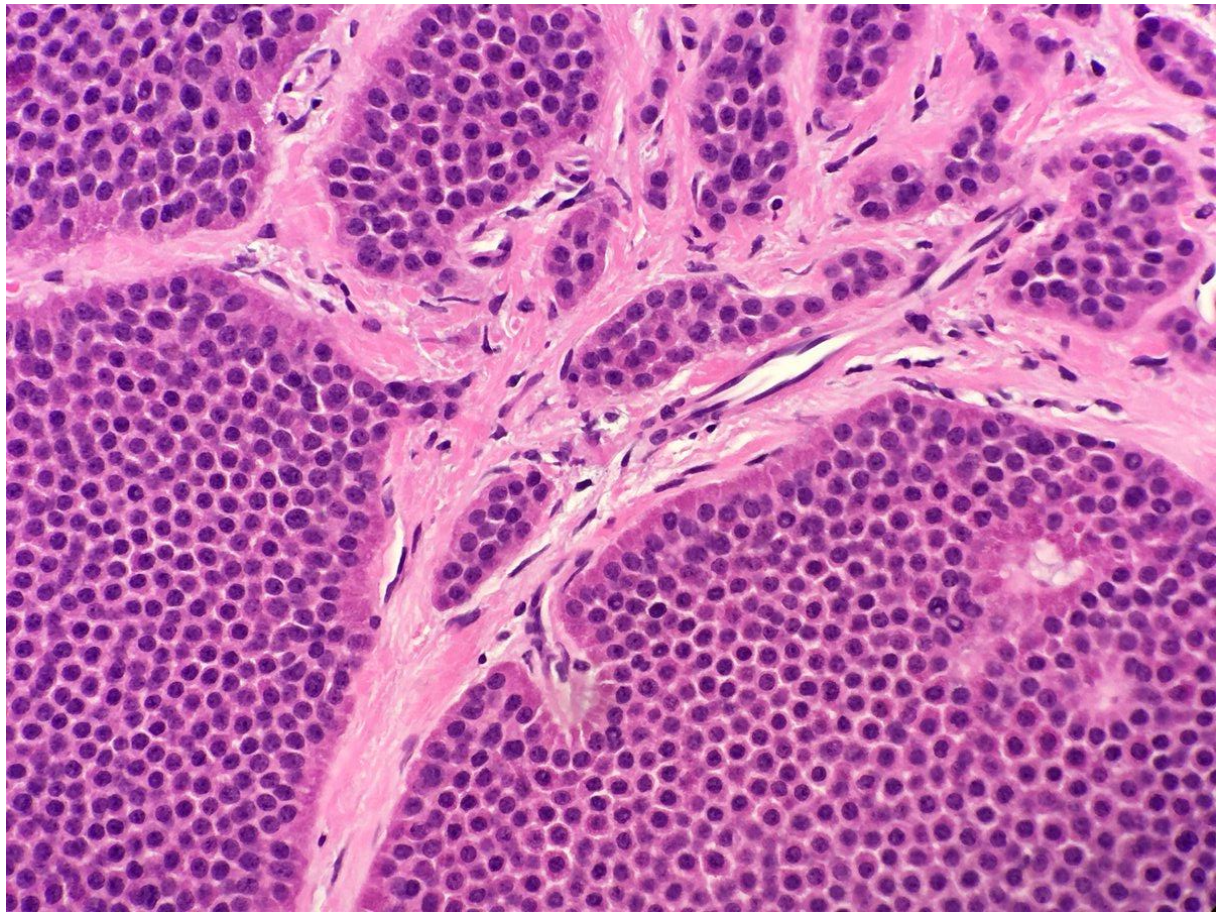


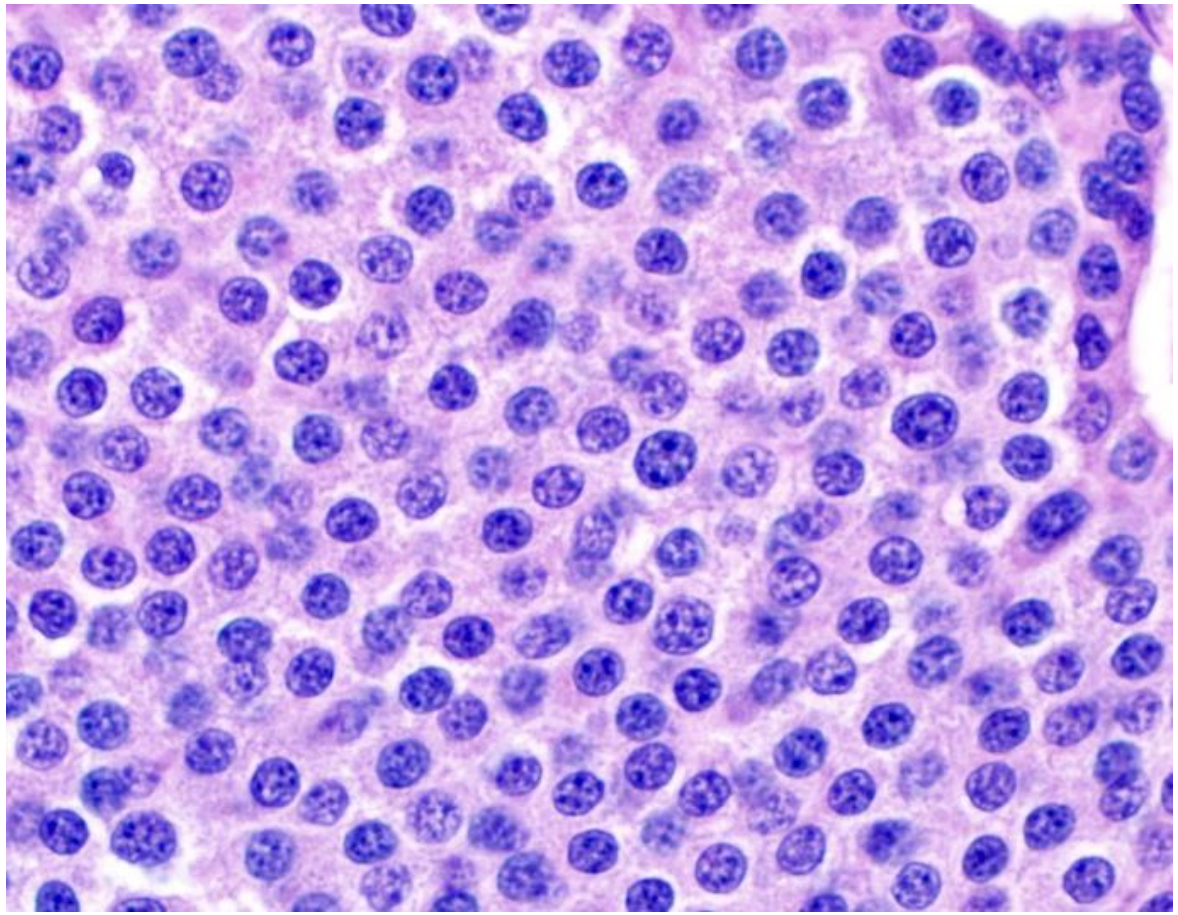
How do we learn classic morphology?

- <u>On your own:</u> *(effortful study!)*
  - Surgical cases
    - Previewing and making diagnoses BEFORE sign-out
  - Textbooks
  - Be on the lookout for good cases (and share them)!!!!!!!!
- Unknown conference
- Didactic lectures

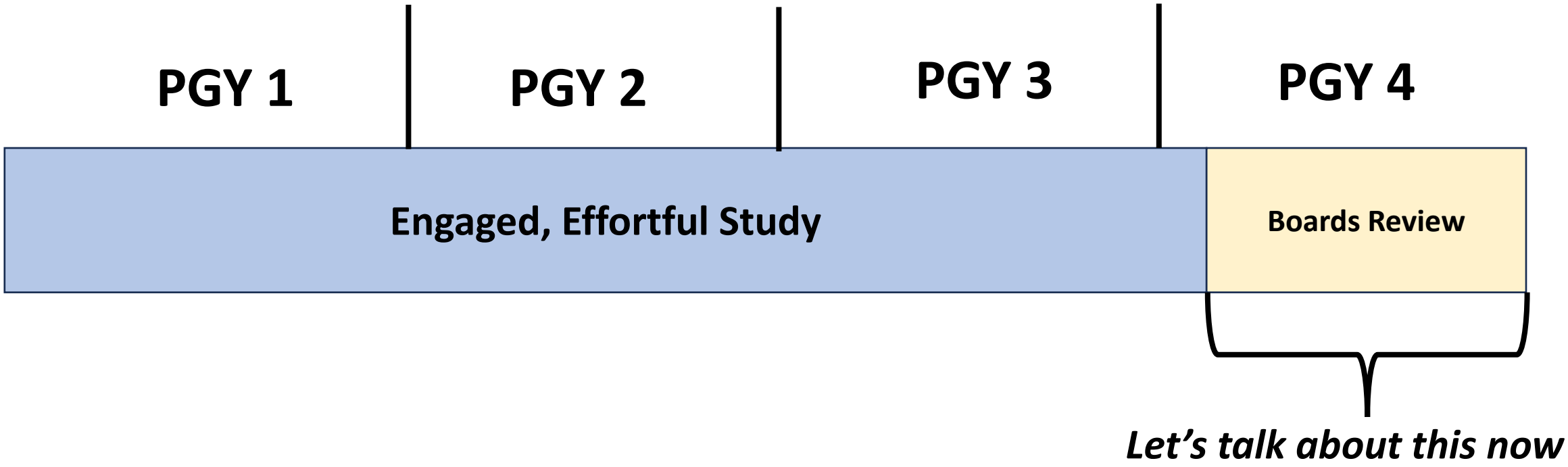
The Goal: Morphologic Independence

- You can recognize things with no history or site (out of context)





Study timing



When should I start studying?

"How far in advance of the exam did you begin studying?"

- 7.7% of respondents began studying 1 to 2 months prior to the exam.
- 52.1% of respondents began studying 3 to 6 months prior to the exam.
- 32.5% of respondents began studying 7 to 12 months prior to the exam.
- 7.7% of respondents began studying more than 12 months prior to the exam.

"During the time you were actively studying, about how many hours per week did you spend studying on average?"

- 14.4% spent 1 to 5 hours
- 26.8% spent 6 to 10 hours
- 22.2% spent 11 to 15 hours
- 19.6% spent 16 to 20 hours
- 17% spent more than 20 hours

cap

***Almost* Everything You Wanted to Know About Pathology Board Exams but Were Afraid to Ask**

Boards Review

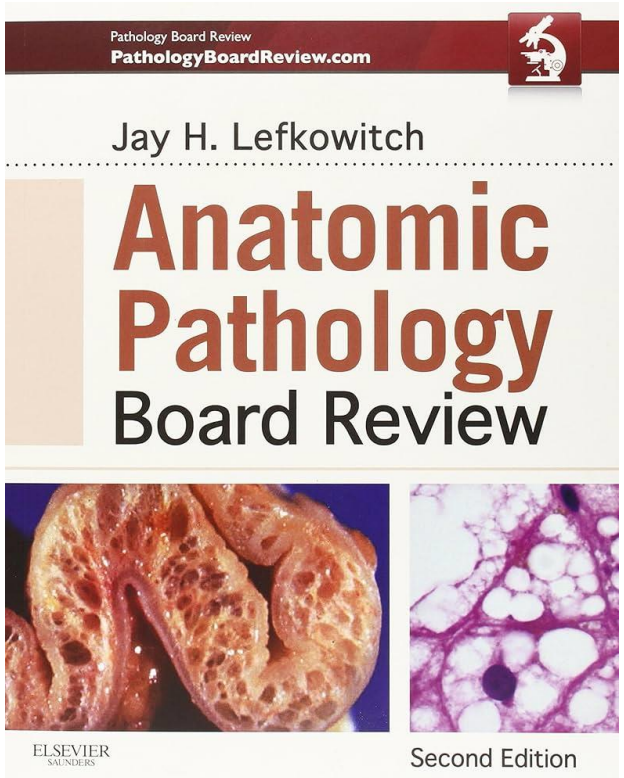
- Think of this as consolidation, review, and filling in gaps.
- Build on your strong foundation from continuous engagement.
- Use “holistic” resources to put on the finishing touches.
- Focus on weaknesses and consider the “blueprint.”

Broad Strokes

- Pick resources that work for *you*, everyone learns differently
  - “Ride the horse that got you here”
  - Books vs Questions vs Lectures vs Flashcards, etc…
- Look at lots of interesting cases/study sets throughout your training
  - Scope sessions are invaluable practice
  - “See as much glass as you can”

High Yield AP Resources (for Boards)

- Anatomic Pathology Board Review, 2nd Edition
  - By Jay H. Lefkowitch



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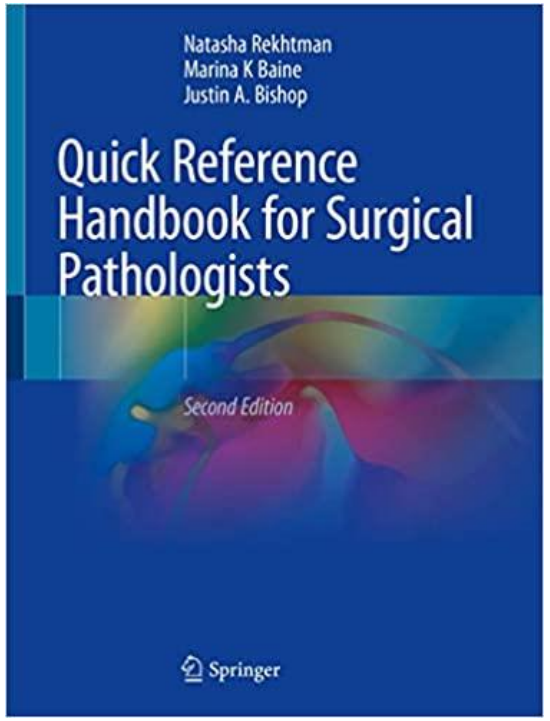

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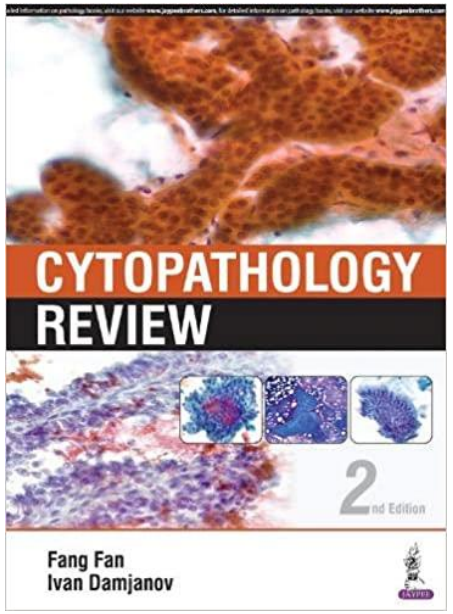

High Yield AP Resources

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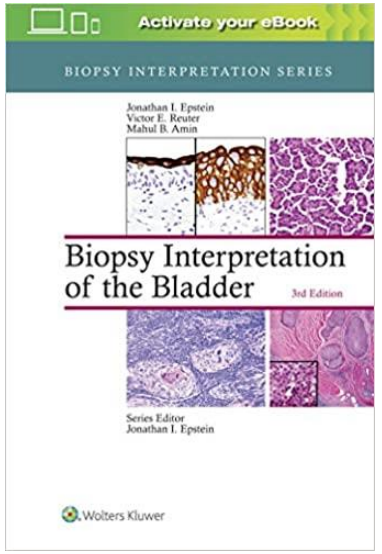
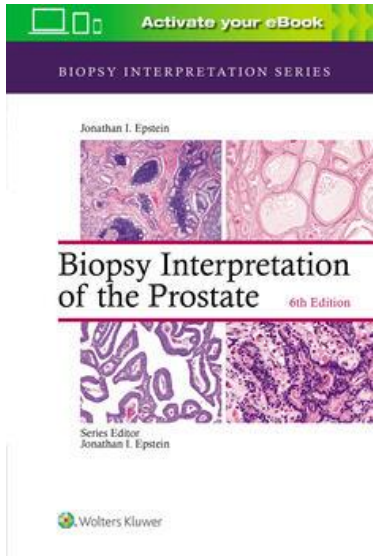
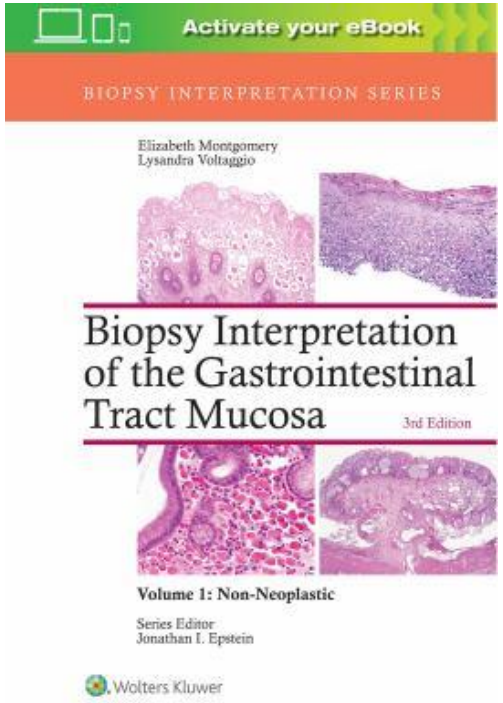
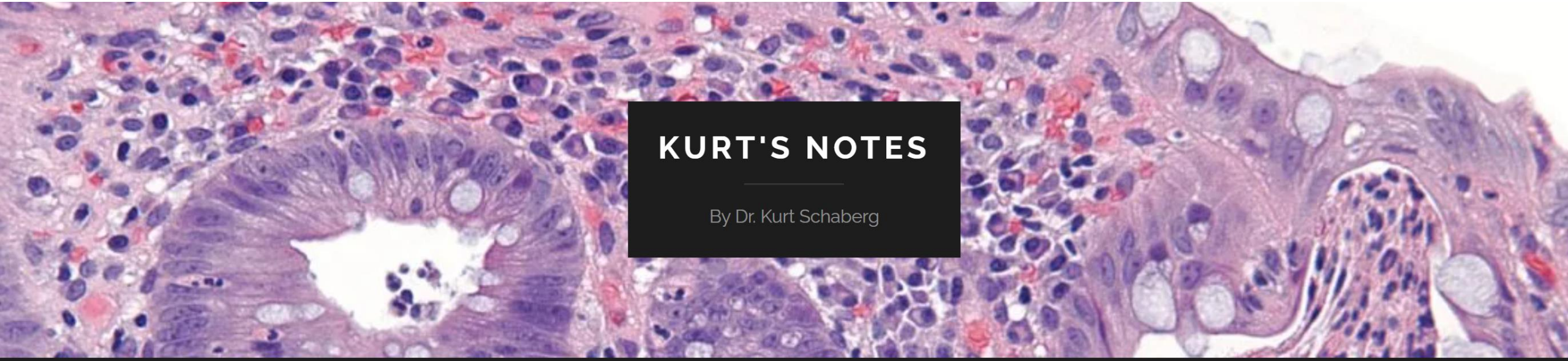
- Quick Reference Handbook for Surgical Pathologists 2nd ed.
  - by Natasha Rekhtman MD PhD
- Cytopathology Review 2nd ed. Edition
  - by Fang Fan MD
- Biopsy Interpretation Series *(focus on <u>pictures and figures</u>)*
  - Particularly: Breast, Prostate, Bladder, GI tract

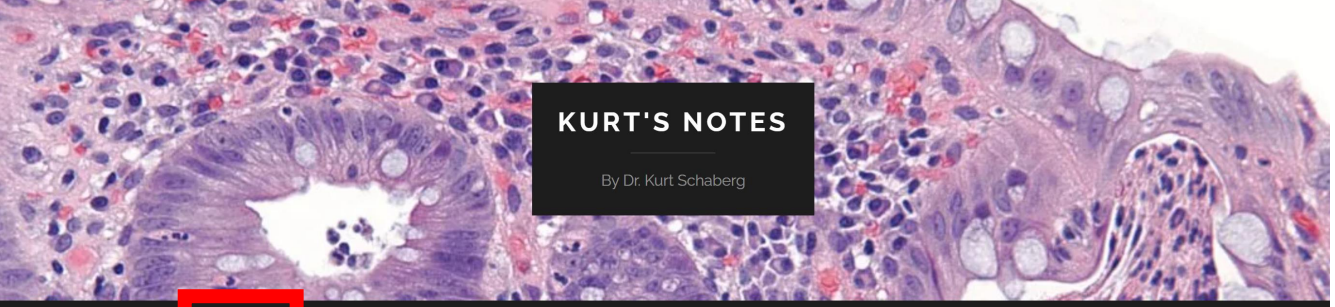








http://kurtsnotes.net/



KURT'S NOTES

By Dr. Kurt Schaberg

Last updated: 9/22/2020

Prepared by Kurt Schaberg MD

Prostate Tumors

Acinar Adenocarcinoma

(The most common/default type of "Prostate Cancer")

An invasive adenocarcinoma consisting of neoplastic prostatic epithelial cells with secretory differentiation arranged in a variety of patterns, typically without basal cells.

Most common cancer in men and second leading cause of cancer death in the U.S.A.

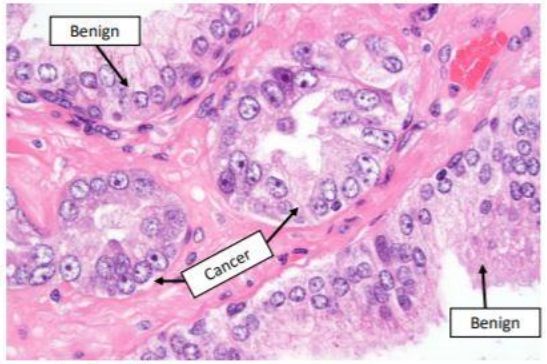
Prevalence is strongly correlated with age (older = higher prevalence)
Majority are **multifocal**, often with 2-3 separate tumors in each prostate.
Most commonly located in **posterior/posterolateral peripheral** gland.
Early tumors are often asymptomatic. Locally advanced prostate cancer mimics BPH with urinary symptoms. Bone very common site of metastasis → bone pain and pathologic fractures

Morphology: Always use *multiple* features (there is no single feature to Dx!)

Nuclear Features:
- Prominent nucleoli
- Nuclear enlargement
- Nuclear hyperchromasia
- Mitotic figures
- Apoptotic bodies

Cytoplasmic features:
- Amphophilic cytoplasm
- Sharp luminal borders

Luminal contents:
- Blue-tinged mucin
- Pink amorphous secretions
- Crystalloids

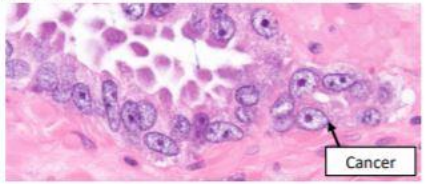


Architecture:
- Crowded small glands
- Linear row of atypical glands spanning the width of a core
- Small glands on both sides of a benign gland
- Haphazard, infiltrative pattern

Absent basal cell layer (can highlight with IHC, as fibroblasts may mimic basal cells)

Usually lack desmoplastic stroma. When present, often associated with high-grade carcinoma.

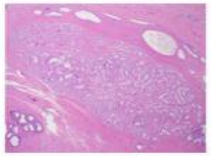
Findings more common in benign glands:
- Atrophic cytoplasm
- Merging with benign glands
- Corpora amylacea
- Inflammation
- Lipofuscin



Gleason Grading

Based on architecture at low power (using 4x or 10x objective).

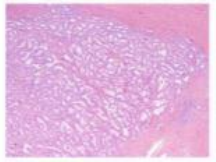
1



Circumscribed nodule of closely packed but separate, uniform, rounded to oval, medium-sized acini

Should **not** be diagnosed regardless of the type of specimen, with extremely rare exceptions

2

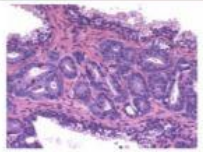


Fairly circumscribed, yet at the edge of the tumor nodule there may be minimal infiltration

Do not diagnose on biopsy, rarely diagnosed regardless of specimen.

Glands are more loosely arranged and not quite as uniform as Gleason pattern 1

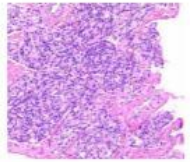
3

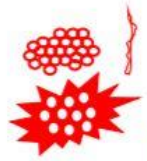


Well-formed glands *(with lumina)*
Separate, discrete, Non-fused

Infiltration

4



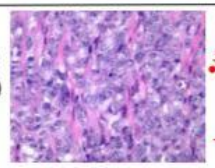


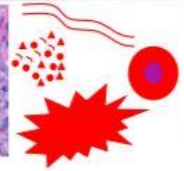
Ill-defined, poorly formed glands
Gland fusion
ALL cribriform glands
Hypernephromatoid
Glomerulations

Ductal Adenocarcinoma (without necrosis)

Often Disqualifies from Active Surveillance

5





Essentially **no glandular differentiation:**
- Solid sheets
- Cords
- Single cells
- Linear arrays

Comedocarcinoma with central necrosis

Notes: Given the importance of distinguishing between patterns 3 and 4 for active surveillance, getting levels can be helpful to differentiate tangential sectioning of small well-formed glands (pattern 3) from poorly-formed glands (pattern 4).

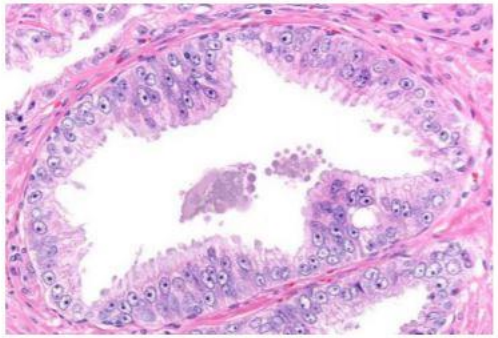
Intraductal Tumors

Non-invasive tumors growing within ducts

High-grade Prostatic Intraepithelial Neoplasia ("HGPIN")

Pre-invasive neoplastic proliferation.
Often multifocal.

Cytologic changes resembling cancer:
- **Nuclear enlargement**
- **Prominent nucleoli**
- **Hyperchromasia**
- **Clumped chromatin**



Although non-invasive, basal cells may be patchy (so be careful interpreting IHC!)

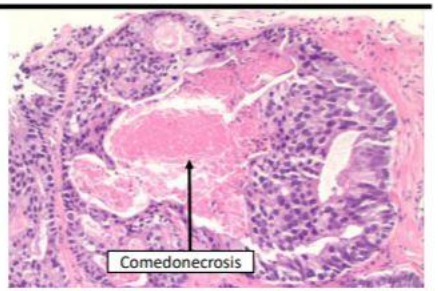
Four main architectures: tufting, micropapillary, cribriform, and flat

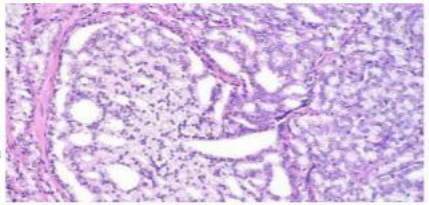
Often cytoplasmic AMACR staining

Clinical importance: associated with subsequent detection of cancer (more HGHPIN→ higher risk)

Intraductal Carcinoma

Diagnostic requirement:
Malignant epithelial cells filling large acini and prostatic ducts, with preservation of basal cells with either:
- Solid or dense cribriform pattern, or
- A loose cribriform or micropapillary pattern with either:
  - Marked nuclear atypia (nuclei 6x normal or larger)
  - Comedonecrosis



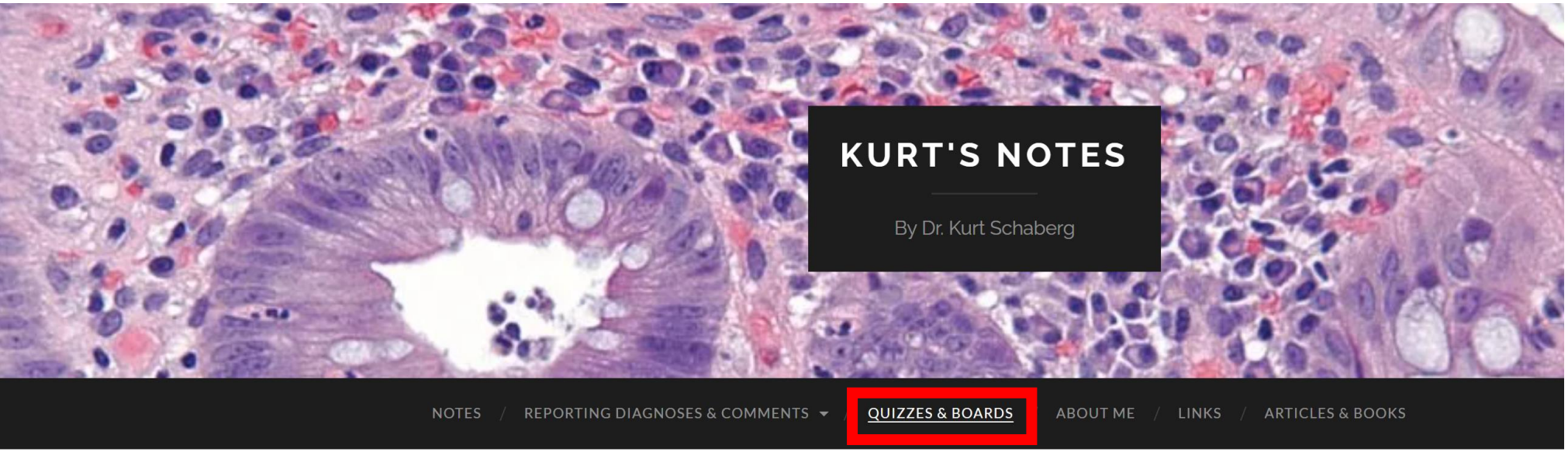


Can be seen in two scenarios:
1) Intraductal spread of a high-grade invasive cancer (majority of cases)
2) Distinct precursor lesion (separate from HGPIN) with high risk of progression to cancer

IHC often required for diagnosis to demonstrate basal cells. Can show loss of PTEN (rarely seen in HGPIN)

If seen on biopsy→ often treat with radical prostatectomy as highly associated with cancer and multiple adverse factors (high Gleason grade, high tumor volume, etc..). Sometimes repeat biopsy immediately.

If a lumen-spanning atypical lesion morphologically falls short of Intraductal Carcinoma, best to call ***"Atypical Intraductal Proliferation"*** and recommend immediate repeat biopsy.



Quizzes & Boards

My best advice for boards preparation is to be engaged and study throughout residency and study for practice. Then, during your last year, do a holistic boards preparation review using a few high-yield resources that work for your learning style. Additionally, try to see as many cases as you can. I've included lots of high-yield cases below, in

For more detail info, check out my lecture on the topic: "Learning Anatomic Pathology and Preparing for the Boards"

This talk in PDF form

This is a little old, but here is an interesting CAP Survey: Almost Everything You Wanted to Know About Pathology Board Exams but Were Afraid to Ask

The CAP survey

Quizzes

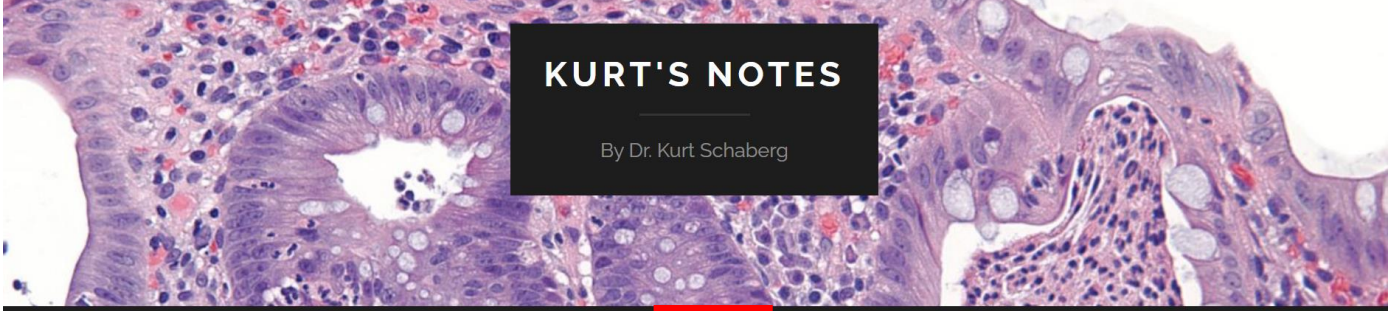
Here are some practice quizzes that I've made using the amazing PathPresenter website:

Practice Board Exams (1/2 Length):

Multiple choice, like the boards. Record your diagnoses on the website, which will grade your answers when you're done. You can then review your selections with the answer sheet after submission to see the answers to the questions you got wrong.

The real AP boards slide exam is 85 slides, for which you have 3.75 hours, so for each 43 question practice test, you should finish in a little less than 2 hours to be "on pace" for the real thing. Or, of course, you could try to do both in 3.75 hours.

Exam #1



PathPresenter | Assessments | Practice Board Exam

Assessment Summary Attachments

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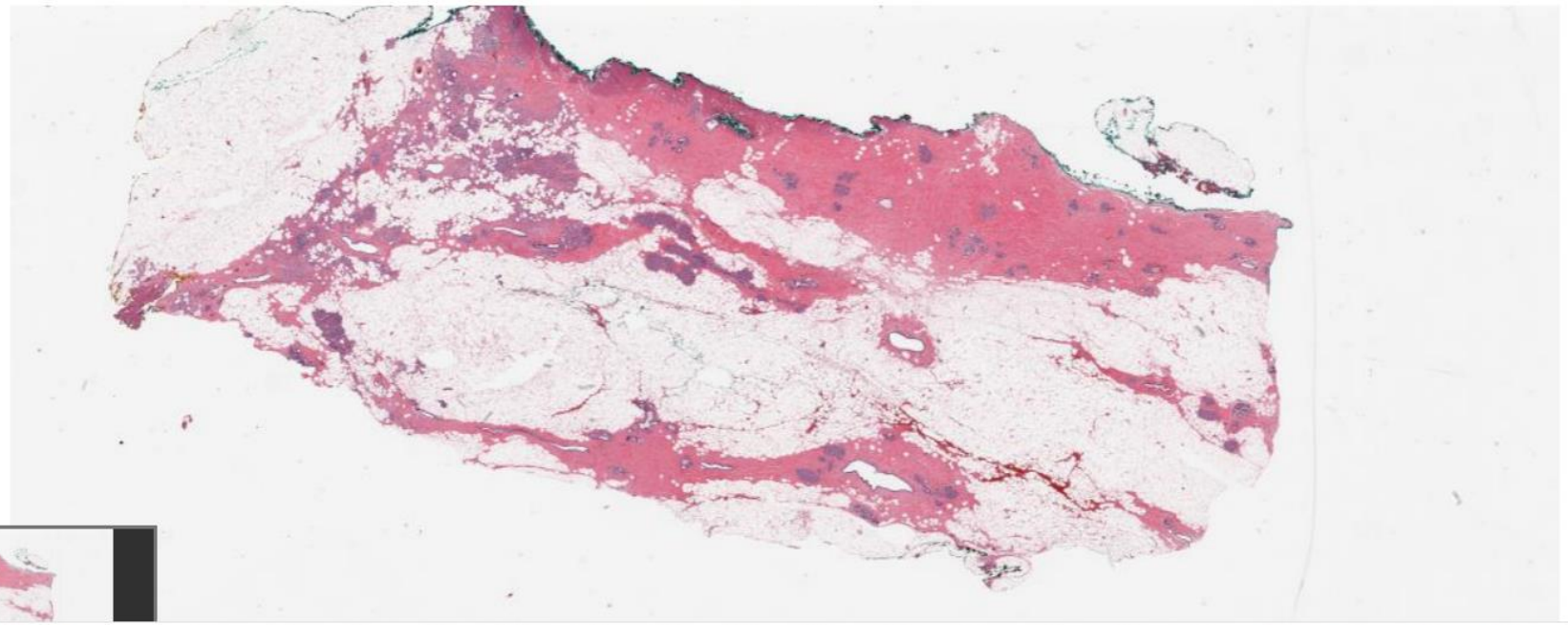

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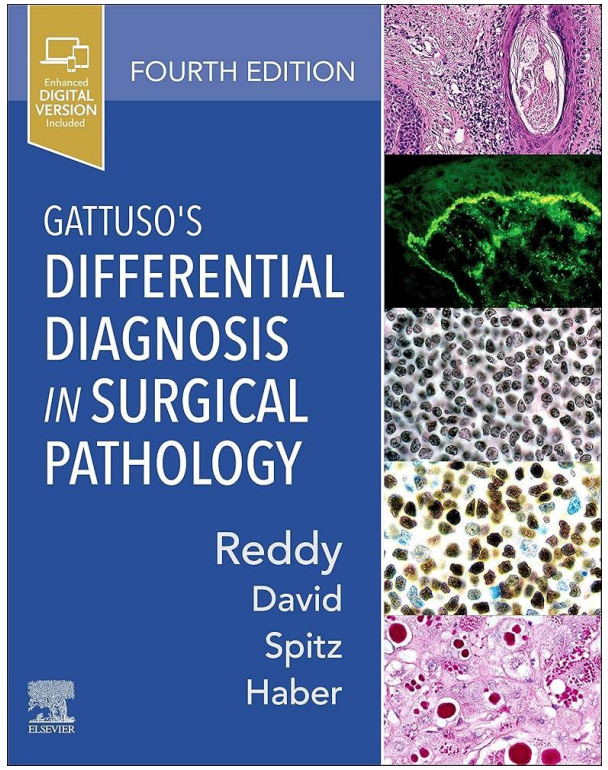
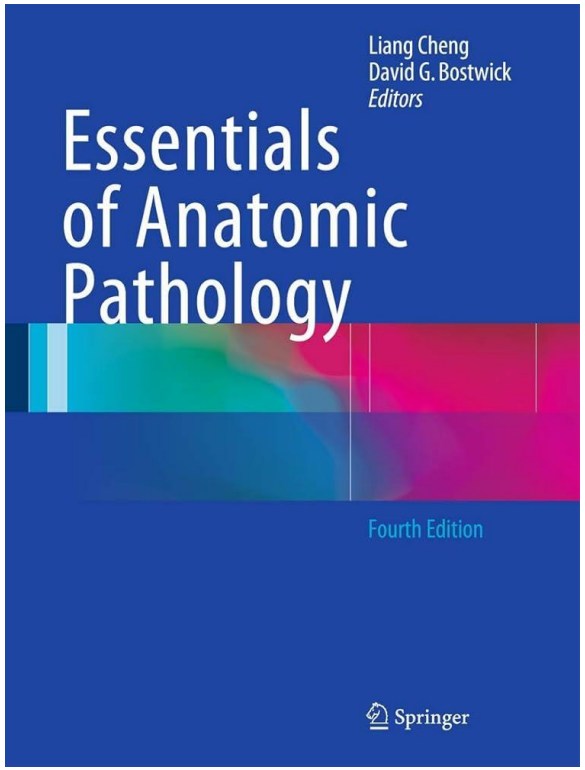
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

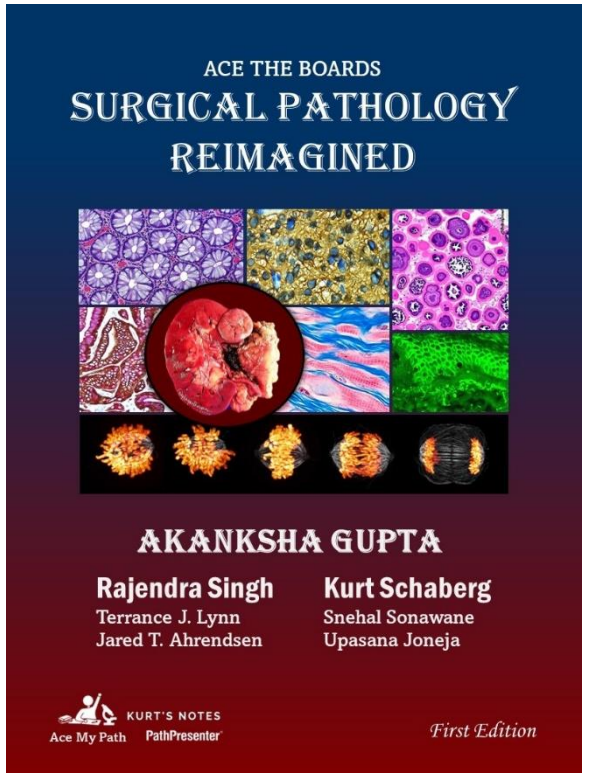
Next

Answered Selected

Other Resources





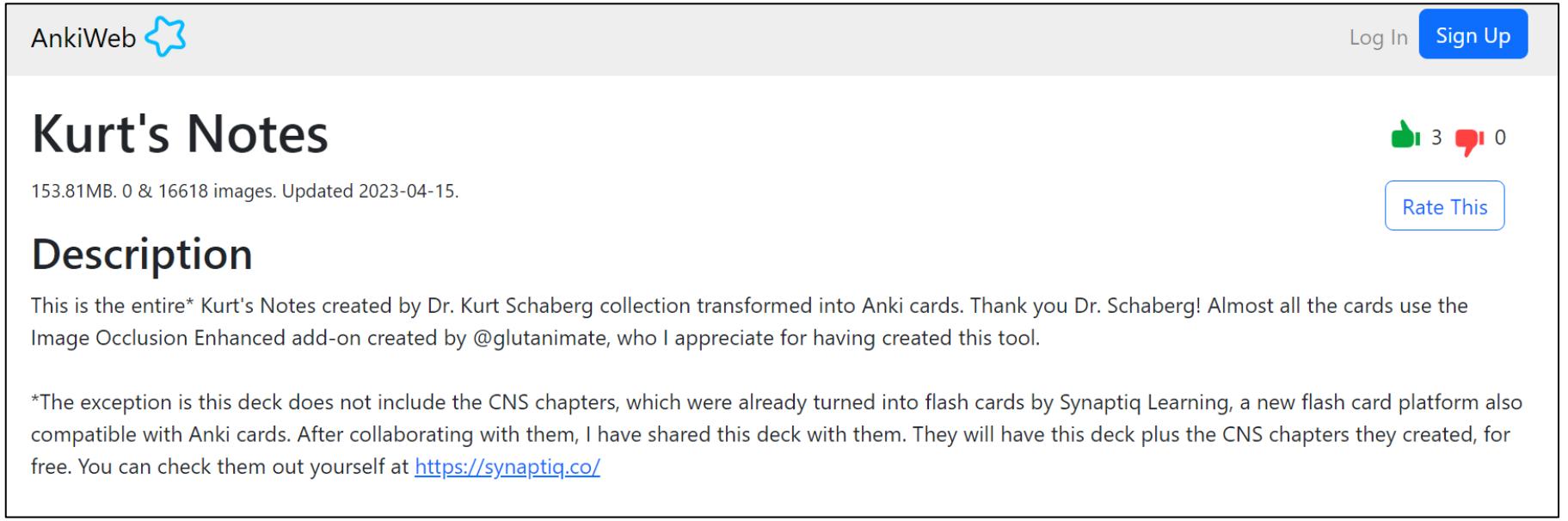


Question Banks

- PathDojo
- PathPrimer
- ASCP PRISE

- If you’re a question person, do as many as you can.
- Do whichever your program supplies.

Anki Decks


AnkiWeb
Log In
Sign Up
Kurt's Notes
3
0
153.81MB. 0 & 16618 images. Updated 2023-04-15.
Rate This
Description
This is the entire* Kurt's Notes created by Dr. Kurt Schaberg collection transformed into Anki cards. Thank you Dr. Schaberg! Almost all the cards use the Image Occlusion Enhanced add-on created by @glutanimate, who I appreciate for having created this tool.
*The exception is this deck does not include the CNS chapters, which were already turned into flash cards by Synaptiq Learning, a new flash card platform also compatible with Anki cards. After collaborating with them, I have shared this deck with them. They will have this deck plus the CNS chapters they created, for free. You can check them out yourself at https://synaptiq.co/


r/pathology • 13 days ago
AnkomaProject
Introducing Ankoma: Partial Anki Deck Release Now Available!
Resident

Review Courses

The Test itself

- The exam is **Pass/Fail**
- It's **multiple choice** (currently only up to 5 choices)
- The exam is very **practical** and is designed to make sure you'll be "**safe**."
- On the AP portion, many questions are simply "**What is this?**"
- Questions don't come from this month's issue of issue of a journal.
  - (So textbooks and review materials work fine for exam preparation)

Preparing for the American Board of Pathology (ABPath) Fundamental Knowledge and Skills

Anatomic Pathology

Content Specifications

Overview:

Anatomic Pathology Content Specifications

This guide outlines the content that may appear on an American Board of Pathology Primary Certification examination.

Guidance: Residents are expected to have a mastery of material designated as Core/Foundational and at least achieved competence for material designated as Advanced Resident. This document also includes content that would be covered in Fellow-level training (shaded in blue) for which Residents should be superficially familiar.

Key to Designations:

C = Core/Foundational Knowledge

AR = Advanced Resident

F = Fellow/Advanced Practitioner

The exam assesses the knowledge, judgment, skills, and abilities needed to identify particular entities, appropriately process specimens (i.e., work-up), and diagnose and/or characterize disease by methods used in anatomic pathology, including molecular methods. Residents are also referred to the Molecular Genetic Pathology Content Specifications document for an in-depth outline of content related to Molecular Pathology, in addition to that presented here.

The specific diseases listed in this document are important for trainees to know, but it is not possible to create a fully comprehensive list of all the material needed for certification and effective practice. This document should be used as a guide.

Preparing for the American Board of Pathology (ABPath) Fundamental Knowledge and Skills

Anatomic Pathology

Content Specifications

1. Breast

1.	Normal Anatomy and Histology	C
2.	Physiologic Changes, Metabolic Conditions & Trauma/Infarct	C
3.	Congenital, Developmental, and Familial Conditions	
	a. Hamartoma	AR
4.	Inflammatory Conditions, Infectious & Non-Infectious	
	a. Fat necrosis	C
	b. Silicone reaction	AR
	c. Granulomatous mastitis	AR
5.	Diabetic mastopathy	AR
6.	Neoplastic	
	a. Benign	
	b. Apocrine Metaplasia	C
	c. Cysts	C
	d. Adenosis (e.g., sclerosing adenosis, tubular adenosis, microglandular adenosis, columnar cell alteration)	C
	e. Radial Scar	C
	f. Epithelial Hyperplasia	C
	g. Usual ductal hyperplasia	C
	h. Lipoma	C
	i. Hemangioma	C
	j. Leiomyoma	C
	k. Fibroadenoma	C
	l. Lactating adenoma	C
	m. Intraductal papilloma	C
	n. Flat epithelial hyperplasia	AR
	o. Nipple adenoma	AR
	p. Syringomatous adenoma	AR
	q. Fibromatosis	AR
	r. Adenomyoepithelioma	AR
	s. Myofibroblastoma	AR
	t. Galactocele	AR
	u. Mucocele-like lesions	AR
7.	Premalignant, Malignant, and Borderline	
	a. Ductal carcinoma in situ (DCIS)	C
	b. Invasive ductal carcinoma, NOS	C

Preparing for the American Board of Pathology (ABPath) Fundamental Knowledge and Skills

Anatomic Pathology

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1. Breast

1. Normal Anatomy and Histology — C
2. Physiologic Changes, Metabolic Conditions & Trauma/Infarct — C
3. Congenital, Developmental, and Familial Conditions
   a. Hamartoma — AR
4. Inflammatory Conditions, Infectious & Non-Infectious
   a. Fat necrosis — C
   b. Silicone reaction — AR
   c. Granulomatous mastitis
5. Diabetic mastopathy
6. Neoplastic
   a. Benign
   b. Apocrine Metaplasia
   c. Cysts
   d. Adenosis
      (e.g., sclorosing adenosis, tubular adenosis, microglandular adenosis, columnar cell alteration)
   e. Radial Scar
   f. Epithelial Hyperplasia
   g. Usual ductal hyperplasia
   h. Lipoma
   i. Hemangioma
   j. Leiomyoma
   k. Fibroadenoma
   l. Lactating adenoma
   m. Intraductal papilloma
   n. Flat epithelial hyperplasia
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   q. Fibromatosis
   r. Adenomyoepithelioma
   s. Myofibroblastoma
   t. Galactocele
   u. Mucocele-like lesions
7. Premalignant, Malignant, and Borderline
   a. Ductal carcinoma in situ (DCIS) — C
   b. Invasive ductal carcinoma, NOS

WHO Classification of Tumours online
Breast Tumours (5th ed.) // Epithelial tumours of the breast // Benign

Columnar cell lesions, including flat epithelial atypia

WHO Classification of Tumours online
Breast Tumours (5th ed.) // Epithelial tumours of the breast // Invasive breast carcinoma: G

Invasive breast carcinoma of no special type

Definition
The term "invasive breast carcinoma (IBC) of no special type (NST)" refers to a large and heterogeneous gr
cial histological types.

ICD-O coding
8500/3 Infiltrating duct carcinoma NOS
8290/3 Oncocytic carcinoma
8314/3 Lipid-rich carcinoma
8315/3 Glycogen-rich carcinoma
8410/3 Sebaceous carcinoma

ICD-11 coding
2C61.0 & XH7KH3 Invasive carcinoma of breast NOS & Infiltrating duct carcinoma NOS

Related terminology
Acceptable: invasive breast carcinoma NOS; invasive ductal carcinoma; infiltrating ductal carcinoma.
Not recommended: invasive mammary carcinoma of no special type.

Preparing for the American Board of Pathology (ABPath) Fundamental Knowledge and Skills

Anatomic Pathology

Content Specifications

2. The Genitourinary System

7. Neoplastic
    a. Benign

i.	Oncocytoma	C
ii.	Cystic nephroma	AR
iii.	Metanephric adenoma	AR
iv.	Neuroendocrine tumors	AR
v.	Angiomyolipoma	F

    b. Premalignant, Malignant, and Borderline

i.	Clear cell renal carcinoma	C
ii.	Papillary renal cell carcinoma	C
iii.	Chromophobe renal cell carcinoma	C
iv.	Collecting duct carcinoma	AR
v.	Mucinous tubular and spindle cell carcinoma	AR
vi.	Translocation related renal cell carcinoma	AR
vii.	Adult Wilms	AR
viii.	Lymphoma	AR

Preparing for the American Board of Pathology (ABPath) Fundamental Knowledge and Skills

Anatomic Pathology

Content Specifications

2. The Genitourinary System

7. Neoplastic
   a. Benign
      i. Oncocytoma
      ii. Cystic nephroma
      iii. Metanephric adenoma
      iv. Neuroendocrine tumors
      v. Angiomyolipoma
   b. Premalignant, Malignant, and Borderline
      i. Clear cell renal carcinoma
      ii. Papillary renal cell carcinoma
      iii. Chromophobe renal cell carcinoma
      iv. Collecting duct carcinoma
      v. Mucinous tubular and spindle cell carcinoma
      vi. Translocation related renal cell carcinoma
      vii. Adult Wilms
      viii. Lymphoma

ABP: 13 tumor types
WHO: >30 tumor types

2. Tumours of the kidney — WHO Classification of Tumours online

Renal cell tumours
- Renal cell tumours: Introduction

Clear cell renal tumours
- Clear cell renal cell carcinoma
- Multilocular cystic renal neoplasm of low malignant potential

Papillary renal tumours
- Renal papillary adenoma
- Papillary renal cell carcinoma

Oncocytic and chromophobe renal tumours
- Oncocytoma of the kidney
- Chromophobe renal cell carcinoma
- Other oncocytic tumours of the kidney

Collecting duct tumours
- Collecting duct carcinoma

Other renal tumours
- Clear cell papillary renal cell tumour
- Mucinous tubular and spindle cell carcinoma
- Tubulocystic renal cell carcinoma
- Acquired cystic disease-associated renal cell carcinoma
- Eosinophilic solid and cystic renal cell carcinoma
- Renal cell carcinoma NOS

Molecularly defined renal carcinomas
- TFE3-rearranged renal cell carcinomas
- TFEB-altered renal cell carcinomas
- ELOC (formerly TCEB1)-mutated renal cell carcinoma
- Fumarate hydratase-deficient renal cell carcinoma
- Succinate dehydrogenase-deficient renal cell carcinoma
- ALK-rearranged renal cell carcinomas
- SMARCB1-deficient renal medullary carcinoma

Metanephric tumours
- Metanephric adenoma
- Metanephric adenofibroma
- Metanephric stromal tumour

Mixed epithelial and stromal renal tumours
- Mixed epithelial and stromal tumour of the kidney
- Paediatric cystic nephroma

Renal mesenchymal tumours

Adult renal mesenchymal tumours
- Classic angiomyolipoma / PEComa of the kidney
- Epithelioid angiomyolipoma / epithelioid PEComa of the kidney
- Renal haemangioblastoma
- Juxtaglomerular cell tumour
- Renomedullary interstitial cell tumour

Paediatric renal mesenchymal tumours
- Ossifying renal tumour of infancy
- Congenital mesoblastic nephroma
- Rhabdoid tumour of the kidney
- Clear cell sarcoma of the kidney

Preparing for the American Board of Pathology (ABPath) Fundamental Knowledge and Skills

Anatomic Pathology

Content Specifications

d. Ependymal Tumors (General Considerations)
   i. Subependymoma F
   ii. Myxopapillary Ependymoma F

21. Administration & Management

a.	Quality Control Procedures	AR
b.	Quality Management Programs	AR
c.	Proficiency Testing	AR
d.	Laboratory Design	AR
e.	Strategic Planning	AR
f.	Budgeting and Financial	AR
g.	Compliance Programs and Billing	AR
h.	Confidentiality / HIPAA	AR
i.	Research Content and IRB	AR
j.	Licensure	AR
k.	Accreditation; Different Accrediting Agencies	AR
l.	Personnel	AR
m.	Safety	AR
n.	Informatics	AR

Preparing for the American Board of Pathology (ABPath) Fundamental Knowledge and Skills

Anatomic Pathology

Content Specifications

My Take

- "A work in progress"
- Inconsistent with some areas having tremendous detail, and other areas have too little detail
- Uses some outdated terms, not recommended by the WHO

- Needs a lot of work…

The Boards: Broad Strokes

- The lesion will be **obvious**.
  - Not looking for a single mitosis or viral inclusion.
- It will be a **classic** example that all reasonable pathologists should agree on.
  - They choose diagnoses with good interobserver reproducibility
  - They won't choose a borderline case of ADH vs UDH, but may choose classic DCIS or UDH
- They love benign mimics of malignancy (and vice versa).
- Fairly direct questions (not second or third order, like in many question banks)
- Include some rare (but classic) diagnoses.

Test day

One Day (10.4 hours/625 mins)			
Time	**Section**	**Number of Items**	**Comments**
(20 min)	Tutorial/Honor Code		
(69 min)	Combined Section A	69	1 min per item
(15 min)	*Break*		
(90 min)	Virtual Microscopy I	30	3 min per item
(15 min)	*Break*		
(68 min)	Combined Section B	68	1 min per item
(60 min)	*Long Break*		
(90 min)	Virtual Microscopy II	30	3 min per item
(15 min)	*Break*		
(68 min)	Combined Section C	68	1 min per item
(15 min)	*Break*		
(90 min)	Virtual Microscopy III	30	3 min per item
(10 min)	Exam Survey		

Most people finish in plenty of time!

3 "Combined" Sections (~68 min each)
"Combined" = "Written" + "Practical"

68 min for 68 items → 1 min per item

3 Virtual Microscopy Sections (90 min each)

90 min for 30 items → 3 min per item

Anatomic Pathology Exam Blueprint	Approximate %	
	Written/Practical	Virtual Microscopy
AP Management & General Pathology Principles	3	0
Breast	8	9
Genitourinary	9	14
Cardiovascular	2	1
Lymph Nodes and Spleen	4	6
Bone Marrow	4	2
Head and Neck	4	7
Alimentary Canal, Pancreas, Liver, Extrahepatic Biliary Tree, Gall Bladder	12	13
Endocrine	5	6
Gynecologic and Placenta	8	7
Medical Kidney	1	2
Respiratory, Pleura, Mediastinum	6	7
Central and Peripheral Nervous System	3	6
Soft Tissue and Bone	5	6
Skin	5	10
Molecular Techniques	1	0
Forensic/Autopsy	3	2
Cytopathology	15	2
Management & Informatics-General	2	0
Total Percentage	**100**	**100**
Total Number of Questions in Each Section	**205**	**90**
Total Hours Allotted for Each Section	**3 Hrs 25 Mins**	**4 Hrs 30 Mins**

Anatomic Pathology Exam Blueprint	Approximate %	
	Written/Practical	Virtual Microscopy
AP Management & General Pathology Principles	3	0
Breast	8	9
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Lymph Nodes and Spleen	4	6
Bone Marrow	4	2
Head and Neck	4	7
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Skin	5	10
Molecular Techniques	1	0
Forensic/Autopsy	3	2
Cytopathology	15	2
Management & Informatics-General	2	0
Total Percentage	**100**	**100**
Total Number of Questions in Each Section	**205**	**90**
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Higher yield areas

Anatomic Pathology Exam Blueprint	Approximate %	
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Breast	8	9
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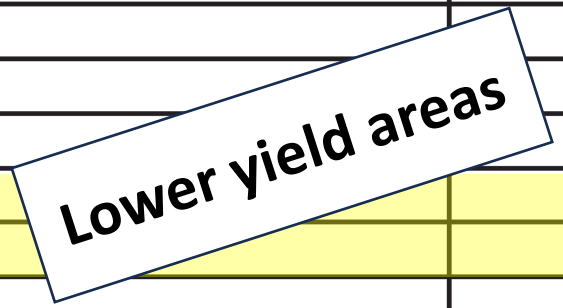
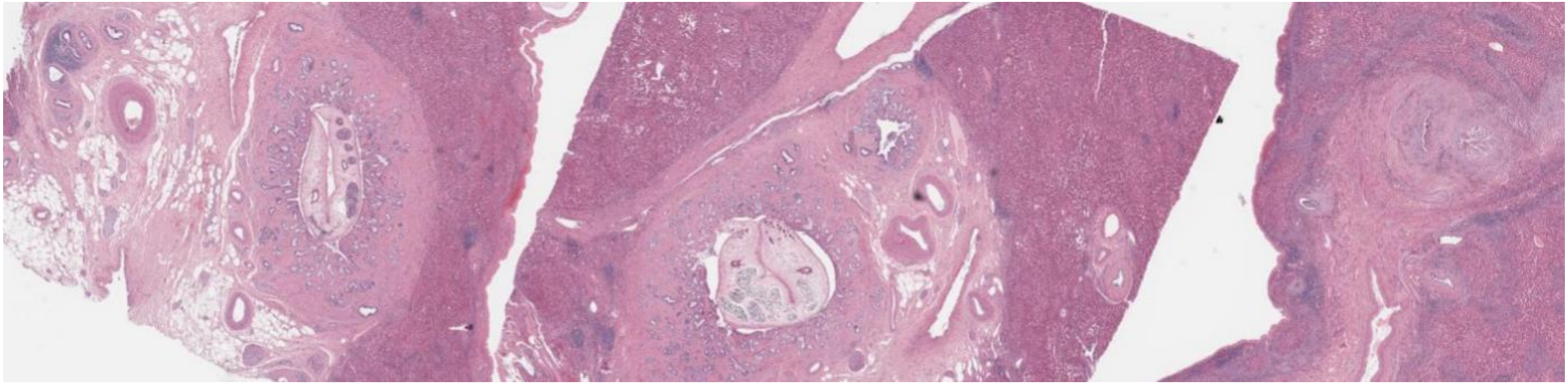
Forensic/Autopsy	3	2
Cytopathology	15	2
Management & Informatics-General	2	0
Total Percentage	**100**	**100**
Total Number of Questions in Each Section	**205**	**90**
Total Hours Allotted for Each Section	**3 Hrs 25 Mins**	**4 Hrs 30 Mins**



Virtual Microscopy Questions

- “What is the best diagnosis?”



“Combined” Written/Practical Questions

- **“Written”**
  - Questions *without* pictures
  - Frequent topics: Lab management, IHC stains, Billing, Molecular

- **“Practical”**
  - Questions *with* static image(s)
  - Frequent topics: Cytology, Forensics, (and anything else surg path ;-)

Made up Written Question:

- Which of the following immunohistochemical stains is most likely to be useful in identifying desmoplastic melanoma?
  A. Pancytokeratin
  B. CD45 (LCA)
  C. SOX10
  D. Melan-A
  E. Factor XIIIa

Made up Practical Question:

- What is the best diagnosis?
  A. Negative for Intraepithelial Lesion/Malignancy (NILM)
  B. Herpes infection
  C. Low-grade squamous intraepithelial Lesion (LSIL)
  D. High-grade squamous intraepithelial lesion (HSIL)
  E. Adenocarcinoma

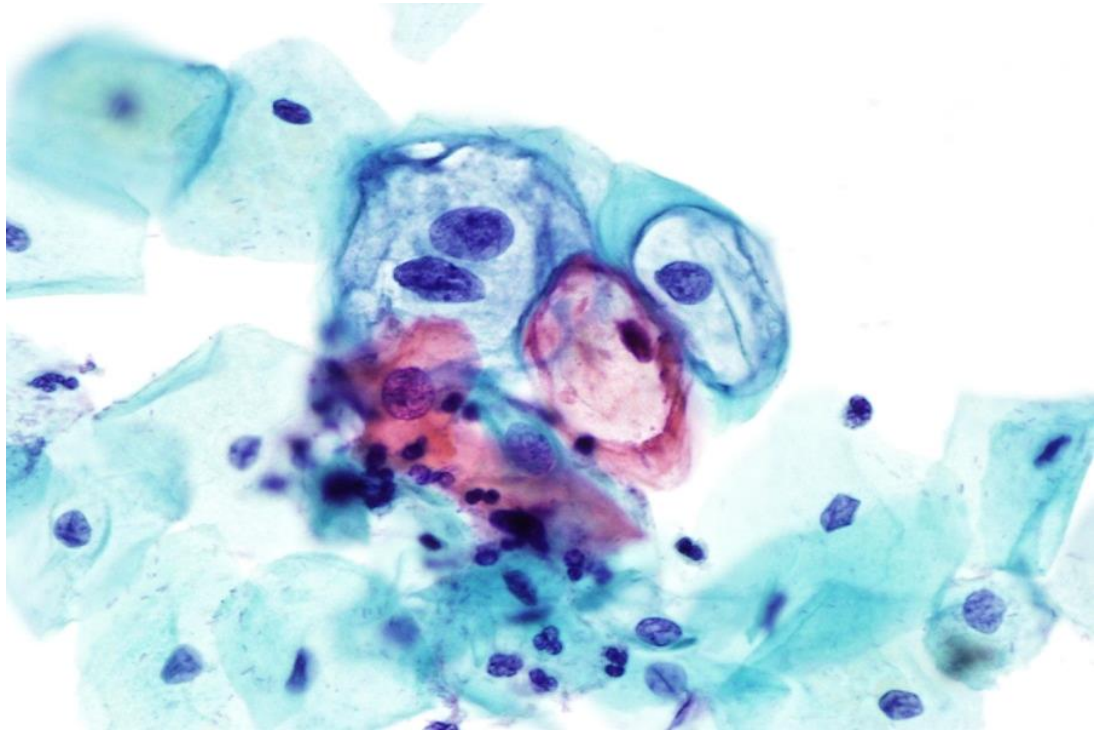


Image quality

Brian Cox, MD, MAS
@Dr_Brian_Cox

The AP boards are finished.

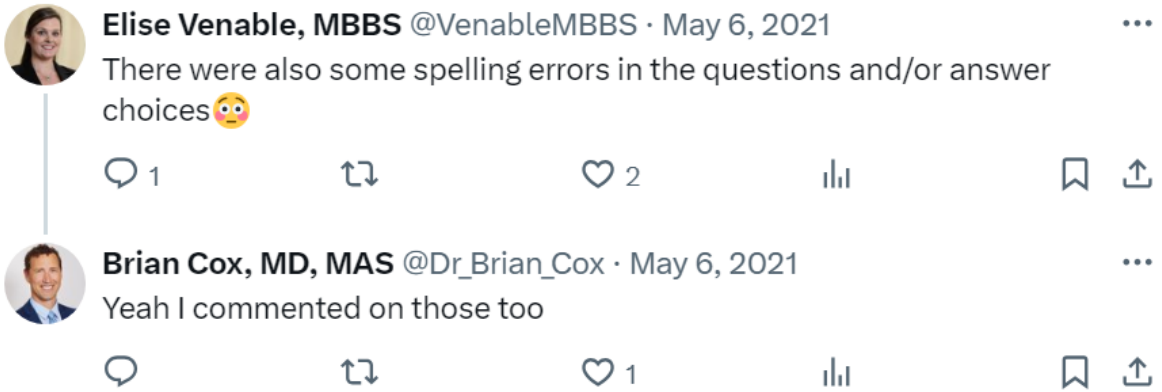
I am extremely dissatisfied with the histology quality offered by @TheABPath. Slides were poorly stained or completely oversaturated. Cytology and heme were 'low power only' from pixelation.

We can and should do (much) better in 2021.

4:46 PM · May 5, 2021 from Culver City, CA

22 18 131 3

Image quality



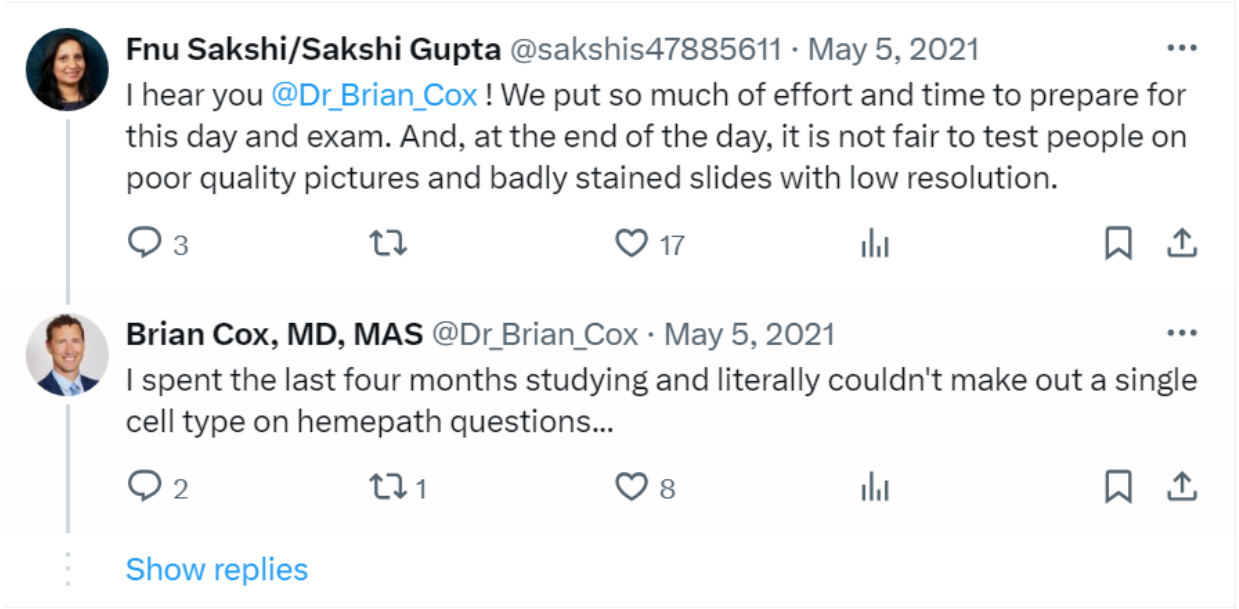


Image quality

American Board of Pathology @TheABPath · May 6, 2021

We hear your concern and are working with Pearson VUE to investigate the issue. Please know we will also review all of the feedback that is submitted during the exam.

3 1 20

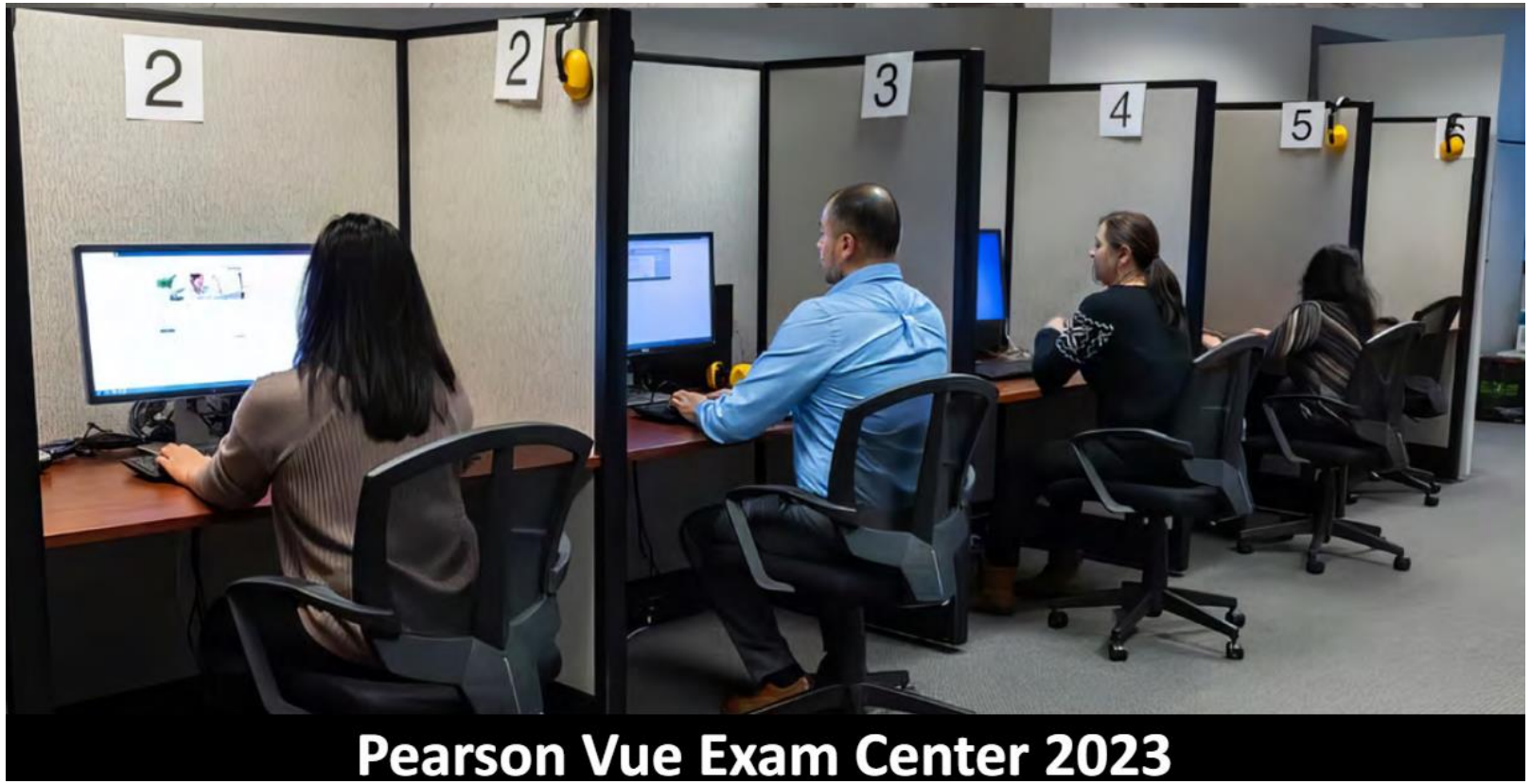
Brian Cox, MD, MAS @Dr_Brian_Cox · May 6, 2021

Thank you for reaching out. I left direct comments on most of the questions I thought lacked reasonable histology. We can discuss directly or during the next Advisory Meeting if that suits.

3

Then

Now



2024 Candidates and Pass Rates

	Total Candidates			First-Time Takers			Repeaters		
	#	# Pass	% Pass	#	# Pass	% Pass	#	# Pass	% Pass
AP	686	519	76%	551	473	86%	135	46	34%
CP	574	483	84%	527	467	89%	47	16	34%

First time Test Takers:
AP: 86%
(Average = mid-low 80s)
CP: 89%
(Average = mid-90s)

5-Year Certified Report

Primary	2020	2021	2022	2023	2024
APCP	397	533	500	477	427
AP only	73	105	100	75	71
CP only	25	55	54	55	50
APNP	8	17	7	5	10

Primary Exam Pass Rates

Primary	2020 % Pass	2021 % Pass	2022 % Pass	2023 % Pass	2024 % Pass
AP only	85	82	87*	84	81
CP only	88	94	94*	94	88

**New criterion standard applied*
% Pass= Spring exam pass rate

2024 Candidates and Pass Rates

	Total Candidates			First-Time Takers			Repeaters		
	#	# Pass	% Pass	#	# Pass	% Pass	#	# Pass	% Pass
AP	686	519	76%	551	473	86%	135	46	34%
CP	574	483	84%	527	467	89%	47	16	34%

Repeaters 34%
(Usually ~50%)

5-Year Certified Report

Primary	2020	2021	2022	2023	2024
APCP	397	533	500	477	427
AP only	73	105	100	75	71
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**New criterion standard applied*
% Pass= Spring exam pass rate

Am I going to pass?

Senior Pathology Resident In-Service Examination Scores Correlate With Outcomes of the American Board of Pathology Certifying Examinations

Henry M. Rinder, MD,[1] Margaret M. Grimes, MD, MEd,[2] Jay Wagner, MBA, MLS(ASCP),[3] and Betsy D. Bennett, MD, PhD[4]; for the RISE Committee of the American Society for Clinical Pathology and the American Board of Pathology

Table 2

Quartiles for Overall 2008 and 2009 RISE Scores for Graduating Residents vs Their Rate of Passing All 2008 and 2009 American Board of Pathology Certifying Examinations

	2008 Graduates (n = 454)		2009 Graduates (n = 424)	
RISE Score Quartile	Examination Pass Rate (%)	RISE Score Range	Examination Pass Rate (%)	RISE Score Range
1st	97	≥565	100	≥533
2nd	92	532-564	99	500-532
3rd	86	505-531	94	473-499
4th	46	<505	66	<472

RISE, Resident In-Service Examination.

Am J Clin Pathol 2011;136:499-506

Final Words

- Be ***engaged*** and study for ***practice*** throughout your training***.***
- Be the pathologist on your cases, just like the medicine residents are the primary physicians for their patients.
- Choose a few high-yield resources that work for your learning style.
- Be sure to put particular emphasis on the most common organ systems/specimens.
- Look at as many cases as you can.

Final Words

- Relax and try your hardest.
- You will not know everything.

Thank you!

Questions?