

Anatomy and Physiology of Surgical Pathology Reporting



LOMA LINDA UNIVERSITY

MEDICAL CENTER

Implementation of the “*Loma Linda Format*”

Introduction to Standard Formatting

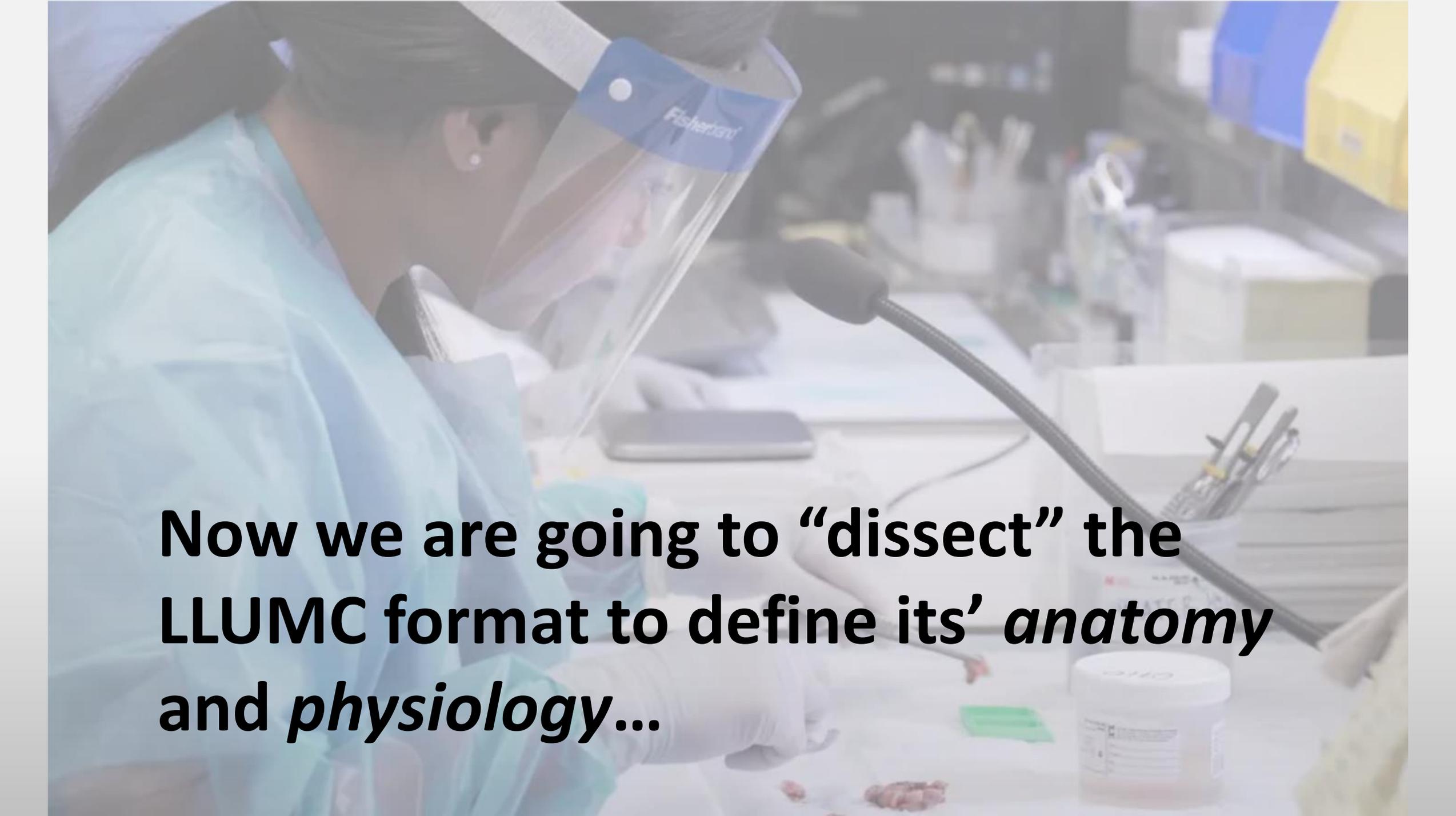


- At LLUMC, there are currently nearly as many reporting styles as there are surgical pathologists
- The identity of the responsible surgical pathologist is often immediately apparent solely by the choice of verbiage and distinct methods of report generation
- This wide variation of reporting styles gives the impression of intradepartmental inconsistency
- The varying reporting methods causes confusion amongst residents, who are expected to tailor their reports to the desires of the particular pathologist with whom they are reading
- Standardization of the formatting and organization of the surgical pathology reports at LLUMC will increase reporting consistency, as well as simplify the report generation by trainees.

Standard LLU Report Format



- The following slides demonstrate the **Standard LLU format**, with illustrative examples and rationale for the chosen report formatting elements
- Following this report format is **mandatory** for all pathology trainees, regardless of the preferences of the attending that they are previewing cases for
- Surgical pathologists are **encouraged** to follow these report formatting guidelines, as this will result in improved intradepartmental consistency in reporting and improved ease of report comprehension by clinical colleagues

A person wearing a light blue lab coat and a clear face shield with a blue top edge is working in a laboratory. They are wearing white gloves and are focused on a task on a white surface. A microphone is positioned in front of them. The background is a typical laboratory setting with various equipment and supplies.

Now we are going to “dissect” the LLUMC format to define its’ *anatomy* and *physiology*...



Report Components

- The final surgical pathology report comprises multiple “**fields**”
 - Diagnosis
 - Comment
 - Clinical Information
 - Intraoperative Consultation
 - Specimens
 - Gross Description
 - Microscopic Description
- Field headings that are in **blue** text are mandatory; the report cannot be verified without at least some text (even a “period”) present
- We will focus on those fields that are unrelated to RFS or grossing

Diagnosis:

A

Site (procedure):

Tissue with findings
Pertinent negatives

Alphabetical specimen designation:

- Each specimen *must* have a diagnosis listed
- For specimens *with the same diagnoses*, multiple specimens can be combined (i.e. A-D, etc)
- In multipart resection specimens, often the “main” specimen is the most important one. Always list the most important specimen first, regardless of the alphabetic designation
- Organize specimens/diagnoses in a logical fashion
 - Main specimen first
 - Specimens most directly relating to specimen (i.e. additional margins, etc)
 - Lymph nodes
 - Miscellaneous specimens (washings, gross only, incidental tissues)

Diagnosis:

A

Site (procedure):
Tissue with findings
Pertinent negatives

Specimen Identity and Procedure:

- Specimen site:
 - Specimen site is always a noun. From where did the tissue come from?
 - Use Commas to facilitate organization of the site (“brain, left temporal lobe”)
 - Verbs/procedures are not permitted in this portion
- Procedure:
 - Always a verb – what is the name of the procedure performed?
 - Always surrounded by parentheses – this aids in visually separating the site from the procedure, two components that share a line
 - Be as specific as possible – this is the opportunity to demonstrate your fund of knowledge. For example, a hernia repair is not a “resection”, it is a herniorrhaphy.

Diagnosis:

A

Site (procedure):

Tissue with findings
Pertinent negatives

First Diagnostic Line: Small Specimens

- The first line should follow the format of “what is it and what does it show” (examples follow)
 - Bilateral enlarged tonsils with reactive lymphoid hyperplasia
 - Antral-type gastric mucosa with reactive gastropathy
 - Unremarkable colonic mucosa
- Some diagnoses are sufficiently simple to “stand on their own”
 - Tubular adenoma
 - *H. pylori* gastritis
 - Seborrheic keratosis

Diagnosis:

A

Site (procedure):

Tissue with findings

Pertinent negatives

Second Diagnostic Line: Small Specimens

- The second line is generally useful for **pertinent negatives**...
 - Small bowel → “No villous atrophy or intraepithelial lymphocytosis seen”
 - Colon → “No colitis seen”
 - Stomach → “No gastritis or intraepithelial lymphocytosis seen”
 - Esophagus → “No reflux alterations or mucosal eosinophilia seen”
- Note: In general, the “No dysplasia or malignancy” statement should be placed down in the comment. Do not repeat the same “No malignancy seen” statement for multiple specimens. It is redundant and unnecessary. This statement should be placed in the Comment.
- Another Note: The template “CNDM” is useful for inserting the “No dysplasia or malignancy seen” in the Comment section.



Benign vs. Unremarkable

- It is common to describe an unremarkable specimen as “Benign”. It was commonplace at the institution where I trained (not LLU)
- However, what exactly are we saying by using the word benign?

Definition of Benign → “Not malignant”

Definition of Unremarkable → “Nothing to see here”

Therefore, please mean say what you mean and mean what you say → when describing “unremarkable” tissue, say “unremarkable” – not benign!



About Those “Gross Only” Cases



- There is confusion of how to format a diagnosis for “gross only” cases
- Avoid the temptation to diagnosis only as “_specimen_ with features as described”
 - Reporting a case out as such suggests to the clinicians that we don’t know why they took it out, and that the pathologist does not feel the need to render a diagnosis. This reporting style has neglected the primary purpose of our reports, to provide a pathologic diagnosis.
- Always follow the standard formatting for these cases, including a **site** (if unknown, give the site as a generic class of what type of specimen was received), followed by a **procedure** (in general, removal or explant), and finally an **informative diagnosis**, with a statement as to why it was taken out.

Examples of “Gross Only” formatting



A

Medical device (removal):

Pacemaker generator, removed from left chest

Clinically at end of battery life

Gross examination only

A

Hardware (removal):

Orthopedic hardware (metal plates and screws), removed from left femur

Clinically retained painful hardware

Gross examination only

A

Bone and tissue, right knee (arthroplasty):

Erosion of articular cartilage and eburnation of subjacent bone

Features consistent with osteoarthritis

Gross examination only

Formatting of Large/Complex Diagnoses

- The “DLARGE” format should be followed for all resection specimens with malignancy. Following this template, in this order, will help to serve as a prompt to ensure inclusion of important data points, as well as make the reports more consistent and accessible to clinicians
- Do not just ask clinicians to see the synoptic report for tumor characteristics; many surgeons expect to see these data points in the body of the report, and do not like having to dig through the synoptic report for details necessary for treatment
- Not all tumors will have all relevant data for each of the lines in the “DLARGE” template. For example, in prostatic adenocarcinoma, there is no tumor size. For specimens such as these, delete the line that is unnecessary
- In the diagnostic line, indicate both the type of tumor and grade/degree of differentiation (if relevant)
 - Example: Invasive squamous cell carcinoma, moderately-differentiated
- The use of **bold-face font** is used to draw attention of the reader to important details. These details include malignant diagnoses, positive margins, positive lymph nodes

Diagnosis:

A

Site (procedure):

Diagnosis

Tumor size: _

Extent: _

Lymph vascular invasion: _

Perineural invasion: _

Surgical margins: _

Background changes

Lymph Nodes: _

Template: “dlarge” + F9

- For positive lymph nodes, give both the **size of the metastatic deposit** and **presence or absence of extranodal extension** (regardless of site of origin). These data points are becoming increasingly useful for prediction of biologic behavior and staging for a wide variety of tumor types
- If extranodal extension is present, measure the *distance from the capsule* that the tumor extends and indicate in the report
- Format for positive nodes:
 - Two of six lymph nodes with metastatic carcinoma (2/6)
 - Metastatic deposit measures 3.8 cm
 - Extranodal extension: Present (0.3 cm from capsule)
- Format for negative lymph nodes:
 - Sixteen lymph nodes, negative for metastatic carcinoma (0/16)

Comment Construction Guidelines



- The “Comment” section of the report is where we discuss the diagnoses with the clinician. As such, proper sentence construction, grammar, and syntax are appropriate.
- If there is diagnostic uncertainty, this is where you discuss your degree of certainty, pathologic differential diagnoses, factors limiting interpretation, and suggested next steps.
- This field should be discussional, and is not the appropriate place for reporting immunohistochemical or special staining results, and is definitely not the appropriate place for a microscopic description (there is a very good reason there is a section entitled “microscopic description” at the bottom of the report).

Comment Example



“The biopsy sampling shows a moderately-differentiated adenocarcinoma. The immunoprofile, although nonspecific, suggests origin from upper the upper gastrointestinal tract or pancreaticobiliary system, to include primary intrahepatic cholangiocarcinoma. Further investigation into possible sites of origin by appropriate clinical and/or radiologic means may be useful for further defining the site of origin.”

“The biopsy demonstrated lung parenchyma with necrotizing granulomatous inflammation. Special staining for fungal and mycobacterial organisms were negative. Of note, the negative special stains do not preclude an infectious process. There was no evidence of malignancy seen. Correlation with clinical and microbiologic studies is warranted.”

Microscopic Description



- Obviously, this is the proper location to write a microscopic description. In general, the chiefs will not write a “micro”, instead will place illustrative images in the report. A picture is worth a thousand words...
- Trainees should select several “complex” cases (i.e. resection specimens, diagnostic core biopsies) to write a microscopic description for. This is good practice for learning how to describe pathologic processes
- *Always* list the immunohistochemical and special staining results in the microscopic description field: Template → **IP8 + F9**; This template also includes a statement of medical necessity
- Regulatory disclaimers, photomicrograph copyright, and resident supervision statements are included in the “**M + F9**” template; The attending pathologist will insert the “M” template

Workflow for Resident Preview Day (“P”)



- To ensure proper interpretation of cases, residents should become familiar with and follow a predictable workflow when reading cases.
- The following slides illustrate the expected workflow for trainees. This workflow, although likely not ever written down before, is the flow that AP chiefs instinctively follow
- This helps to ensure patient safety, retrieval and synthesis of pre-analytic data, and aids in generation of a high-quality and complete pathology report

Step 1: Case Assembly and ID Verification



- Compare requisition with slides; verify that accession number and name on slides matches that on the requisition.
- Enter accession number in *Online Review* application in Cerner; ensure that name in Cerner report matches that on slide and requisition



Step 2: Review Demographics/History

- In this step, you ask the question “what is the age and gender of the patient”, and “what is the pertinent history”. If answering this question raises any red flags, reviewing the patient’s EMR Chart is required. If not, you can skip EMR and proceed to the next step
- Example: Descending colon polyp in a 63-year-old male, screening colonoscopy. This scenario makes sense, so no records review is required
- Another example: Mediastinal lymph node biopsy in a 15-year-old female. This is not a “routine” case, and significant pre-analytic record review is required

Moral of this story → You have to know “why did the surgeon/clinician take this out” prior to looking at the case. If you don’t know, look it up!

Review Demographics/History Continued



- Sources of useful history in the EMR are varied. In general, the following sites are commonly queried by surgical pathologists...
 - Imaging
 - CT, PET, and MRI scans are useful for soft tissue lesions
 - X-rays and CT scans are useful for lesions of bone
 - Often, the reports will provide information not indicated on the requisition, such as the presence or absence of regional lymphadenopathy or lesions elsewhere in the body
 - Procedures
 - This is where you find the endoscopy reports; always review these in GI biopsy from the colon if there is a suspicion for IBD, infection, etc
 - Microbiology
 - Culture results are very relevant in cases where infection is a concern
 - Notes
 - Reviewing operative reports, specialty consultation notes, and H&P notes often yield information about presentation, history of previous malignancies, or other factors that are useful (i.e. patient immune status)



Step 3: Pathology History Inquiry

- You must review the previous pathology history; knowledge of prior pathology history and previous workups prevents costly and unnecessary repeat testing.
- Patients often make more of the same thing → if they have a history of a tubular adenoma on prior colonoscopy, chances are they will get another one.
- If a previous GE junction biopsy shows dysplasia, pathologists will worry less about rendering the diagnosis a second time. However, we will struggle greatly with rendering a de-novo diagnosis, nearly always consulting with colleagues prior to doing so



Step 4: Read the Gross Description

- This step ensures that you are knowledgeable about what specimen was received, what abnormalities were noted, and how the specimen was processed.
- This is a good time to begin making diagnoses. If, for example, there is a portion such as a medical device that is “gross only”, render this diagnosis now. This prevents you from forgetting to incorporate this in the list of final diagnoses when reading the slides. Also, make note of important gross findings. For example, I will read the gross from a complex specimen, and in the diagnosis for that specimen, I will write down gross tumor size, what organs involved, etc.



Step 5: Look at the Slides (*finally!*)

- Now that you know the “who” and “why” of the pathology specimen, background history, and gross findings now you can finally look at the slides.
- In complex cases, read the block key as you read the slides, so you understand what the intent of the grossing personnel was in taking the specimen. Examples of how this helps are as follows:
 - If a cap has a margin, was that margin a “shave” or “perpendicular” section?
 - Is a cap supposed to contain lymph nodes; if so, how should they be counted?
 - Are sections of tumor contiguous, or single representative sections?



Step 5: Look at the Slides (*finally!*)

- What stutures are sampled adjacent to the lesion? While reading slides, you are encouraged to take notes in the specimen line. However, remember that there may be findings that change the diagnoses (such as a higher-grade or sarcomatous component, a deeper area of invasion). As such, do to “finalize” your diagnoses until you have read all of the slides
- For lymph node sections, indicate on the slide the lymph node count as a fraction (1/4 means one of four lymph nodes positive for metastatic tumor). You can then add the count up by looking at the slides on the tray. I also write the size of the metastatic focus and the presence or absence of extranodal extension (ENE+ vs. ENE-)



Step 6: Generate and Audit Report

- At this point, you have reviewed the history, read the gross description, and read all of the slides. Write your diagnoses according to the above-described standard formatting
- If any additional studies are needed, consult with your Chief Pathologist and order them now. After ordering the slides, this is a good time to enter the study result table (IP8 +F9) in the micro field of the report as a reminder to your Chief that stains are pending
- Verify that you have rendered **one diagnosis for each specimen**. As simple as this sounds, it is easy to forget to render a diagnosis on one of the specimens. It is one of the most common report errors that results in an incomplete report, and all pathologists are guilty of periodically committing this sin! Now you have completed the audit step.



Step 7: Spell-Check and Review Report

- *Always* **spell-check** pathology reports prior to report verification
 - Remember that spell check is imperfect. Not all pathology terminology is present in the dictionary, and it will not detect words that are used incorrectly yet properly spelled.
- Once this step is complete, the last step is to **start at the top and read the entire report.**
 - Does what you wrote make sense? Are there any double-negatives or other typographical errors that change the meaning of the report?
 - Are all necessary reports components completed?
 - This final “quality check” is highly important, is often the time that we catch errors that would have been very embarrassing. Remember, the pathology report is an indicator of our expertise and lab quality; we should all strive for well-constructed, informative, and properly-detailed reports!