

Table 2: Consolidated sequence model

Activities	Intents	Abstract steps: Strategy 1	Abstract steps: Strategy 2	Abstract steps: Strategy 3
1. Overall intent: Prepare for the day's workload				
Overall trigger: Arrival of case packages to pathologist				
Estimate the day's workload	<p>"Get a feel" for the volume of cases</p> <p>"Get a feel" for complexity and difficulty of cases</p>	<p>Scans accession log for total number of cases</p> <p>Matches surgical cases with cytology cases</p> <p>Segments (sorts) cases by part type</p> <p>Segments cases by predicted complexity of case (cancer case vs. benign case)</p> <p>Segments cases by predicted amount of tissue to be examined</p> <p>Manually tallies cases by segments on hardcopy of accession log</p>	<p>Glances at pile of requisition sheets</p> <p>Browses through requisition sheets and glances at clinical histories and names of submitting clinicians</p>	
Organize all materials for new incoming cases	Match requisition sheets with relevant slides	<p>Organizes slide trays in "best fit" numerical order by accession number</p> <p><i>Breakdown: Cases are not always in order within and between slide trays</i></p> <p>Matches requisition sheets to slides and trays</p> <p><i>Breakdown: Occasionally requisition sheets are missing and need to be requested</i></p> <p>Notates receipt of additional stain (checkbox)</p>		
2. Overall intent: Make and deliver diagnoses				
Overall trigger: Cases organized and ready for review				
Examine a case	<p>Gather contextual information about a case</p> <p>Verify that the correct slides are being examined</p>	<p>Notes clinical history, submitting physician, patient demographics from requisition sheet</p> <p>Retrieves additional information from EMR (radiology reports, operator notes, referral letter, and history of present illness)</p> <p>Retrieves previous diagnoses from APLIS</p> <p>Matches accession number and part number on slide label with other artifacts (requisition sheet, APLIS)</p> <p>Double checks handwritten label from back of slide to identify sticker labeling errors</p>	<p>Notes clinical history, submitting physician, patient demographics, and previous diagnoses from working draft</p> <p>Matches accession number and part number on slide label with other artifacts (working draft, APLIS)</p>	

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	Verify that all slides relevant to the case were delivered and are being reviewed Gather information about the tissue	Knows the number of parts to expect based on requisition sheet/working draft While picking up slide from slide tray, quickly glances at glass slide and deduces type of surgical procedure, amount of tissue, and amount of hematoxylin vs. eosin staining	Correlates slide labels with gross description	
	Create initial impression about a case	Mentally collects information from clinician and specimen to form a hypothesis in preparation for examining a slide		
	Examine slides	Places glass slide on microscope stage Scans the slide for regions of interest on low magnification Uses higher magnification to see more details in regions of interest	Overlays slide to find corresponding regions of interest on different tissue slices obtained from the same block	
		Returns slide to tray <i>Breakdown: Interruptions occur frequently during examination and pathologist has to re-familiarize herself with the case upon return</i> Moves to next slide/part in case		
	Refine hypothesis	Makes notes on important findings/ diagnosis to be included on the final report Adds findings on slide to hypothesis Makes decision whether currently available information is sufficient for determining a diagnosis <i>Breakdown: Frequently the clinical history provided by the clinician is too sparse</i>	Annotates slide with felt tip pen to indicate important findings	
	Obtain additional pertinent information	If information is NOT sufficient: Obtains additional morphological information—orders more stains, additional tissue, or obtains additional information from clinician (phone call) or EMR If information is sufficient: Creates final report		

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Communicate the diagnosis	Create the final report	Launches dictation system (using a Dictaphone)	On STAT cases pathologist will call clinician to convey findings to ensure timely communication of findings	On certain cases pending additional studies (such as electron microscopy), pathologists will call clinician to report preliminary findings
	Verify match between dictation and case	Identify self Identify case by scanning barcode Dictates patient identifiers as a double check to the barcode Dictates part label Dictates final diagnosis Dictates diagnosis comment Dictates placeholders for pending information Dictate stains	Identify case by dictating accession number	Direct entry into APLIS; Launch APLIS Enter the case in APLIS; go to edit final report activity Type part labels Type diagnosis Type comments Type placeholders
	Document items to prevent legal action	Dictates items required to protect against lawsuits		Type stains Type items required to protect themselves from lawsuits
	Complete all case-related actions/ examinations	Closes the dictation system Returns to other activities while awaiting dictation transcription Completes other items relevant to the case, including examination of additional noncritical slides and stains, QA, and confirmation of specific findings by other pathologists	Opens dictation for next case (if performed in batches)	
Sign-out		Enters APLIS Enters worklist Views transcribed case with final formatting Matches requisition sheet/ working draft with notations to the electronic report <i>Breakdown: Paperwork and electronic reports are not in the same order</i> Notes on paperwork do not match electronic report: slides must be re-examined to determine the reason for discrepancy Completes placeholders Proofreads and edits final report		

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		Enters electronic signature and releases the case		
3. Overall intent: Obtain additional morphological information about a case				
Overall trigger: Decision point during case examination that requires additional morphological information to clarify case findings				
Order additional stains or slides	Obtain additional information from the tissue to refine hypothesis	Determines if additional morphological information is required to render a complete diagnosis Determines the specific stain/s that will provide additional information	Assigns task to a trainee	
		Enters case into APLIS Enters stain ordering activity in APLIS Identifies the part(s) and/or block(s) that should undergo additional cutting and staining		
4. Overall intent: Aggregate slides with different stains for an ongoing case				
Overall trigger: Arrival of slides with pending stains to pathologist				
Organize all materials for cases pending additional stains	Match incoming additional stains with cases pending stains	Receives slides with additional stain from courier	Assigns task to trainee	
		<p><i>Breakdown: Additional stains arrive throughout the day</i></p> <p>“Flips” through stack of cases pending stains to find the case with the accession number matching incoming stains</p> <p><i>Breakdown: Requests for additional processing/slides for a case do not always arrive together and therefore the case is placed into the pending pile several times</i></p> <p>Indicates that a stain was received; typically done by marking a check box</p> <p>Returns case into pending pile if additional stains are pending</p>		Sometimes reviews case before all stain requests are received because the other stains may not be critical to making the diagnosis
		<ul style="list-style-type: none"> • If additional stains are NOT pending: Case is ready for final review • If additional stains are pending for several days: Pathologist checks again 		
		<p><i>Breakdown: Sometimes a case remains unnoticed in a pending pile because a stained slide never arrived or accidentally was not ordered</i></p>		