

Simulation Tutor Training

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Simulation Tutor (SimTutor) Training

Introduction

SimTutor is an intelligent tutoring system, which is an adaptive, instructional system that tries to mimic the well-known benefits of one-on-one tutoring or the “apprenticeship” type of training that is the conventional model for teaching histopathology diagnosis.

This system will present you with pigmented skin lesion cases to examine in order for you to provide a final pathologic diagnosis as well as generate a final pathologic report. Our tutoring system is “intelligent” because first, it records what parts of the digital slide(s) you have examined as well as any information you input into the tutor while examining a case or writing your report. Second, due to the collection of this data, if you render an inaccurate diagnosis, the tutor has information that enables it to hypothesize what aspect(s) of your case examination may have led you to the incorrect diagnosis (e.g., you misinterpreted a particular pathologic change or you missed seeing a diagnostic criterion that was present on the slide).

If you report an incorrect diagnosis, the tutor will use the information you have provided during your case examination to provide feedback and clues to lead you to the correct diagnosis for the case. In this way, it focuses on addressing any diagnostic pitfalls that you may personally be prone to in making diagnoses on difficult pigmented skin lesions suspicious for melanoma.

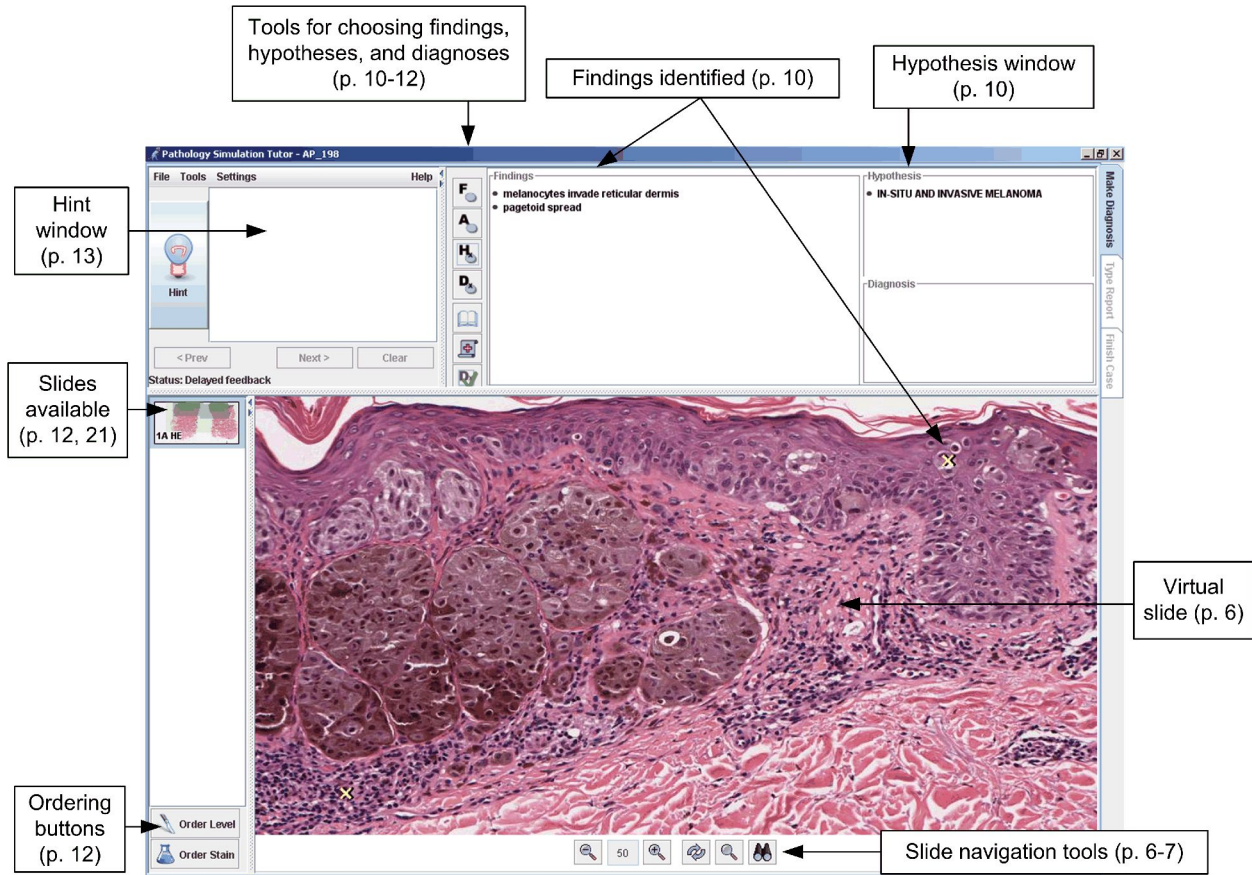
The ultimate design goal of this system is to simulate sitting at a double-headed microscope across from an expert dermatopathologist and working through cases, with the aim to identify any diagnostic pitfalls you may be prone to, bring them to your attention, and then present you with similar lesions to give you the opportunity to demonstrate to yourself that you have improved your personal skill set in diagnosing difficult melanocytic lesions.

While working with the system, you may be asked to locate/confirm the presence or absence of diagnostic criteria and provide differential diagnoses, which should logically lead one to the correct diagnosis. Oftentimes, the most efficient way to complete the case is to ask for “hints” (see use of tutor instructions below) and go ahead and do what each sequential hint suggests. This strategy will lead you to the correct diagnosis the quickest so you can move on to the next case, while still revealing diagnostic information to you regarding why you may have chosen the incorrect diagnosis initially.

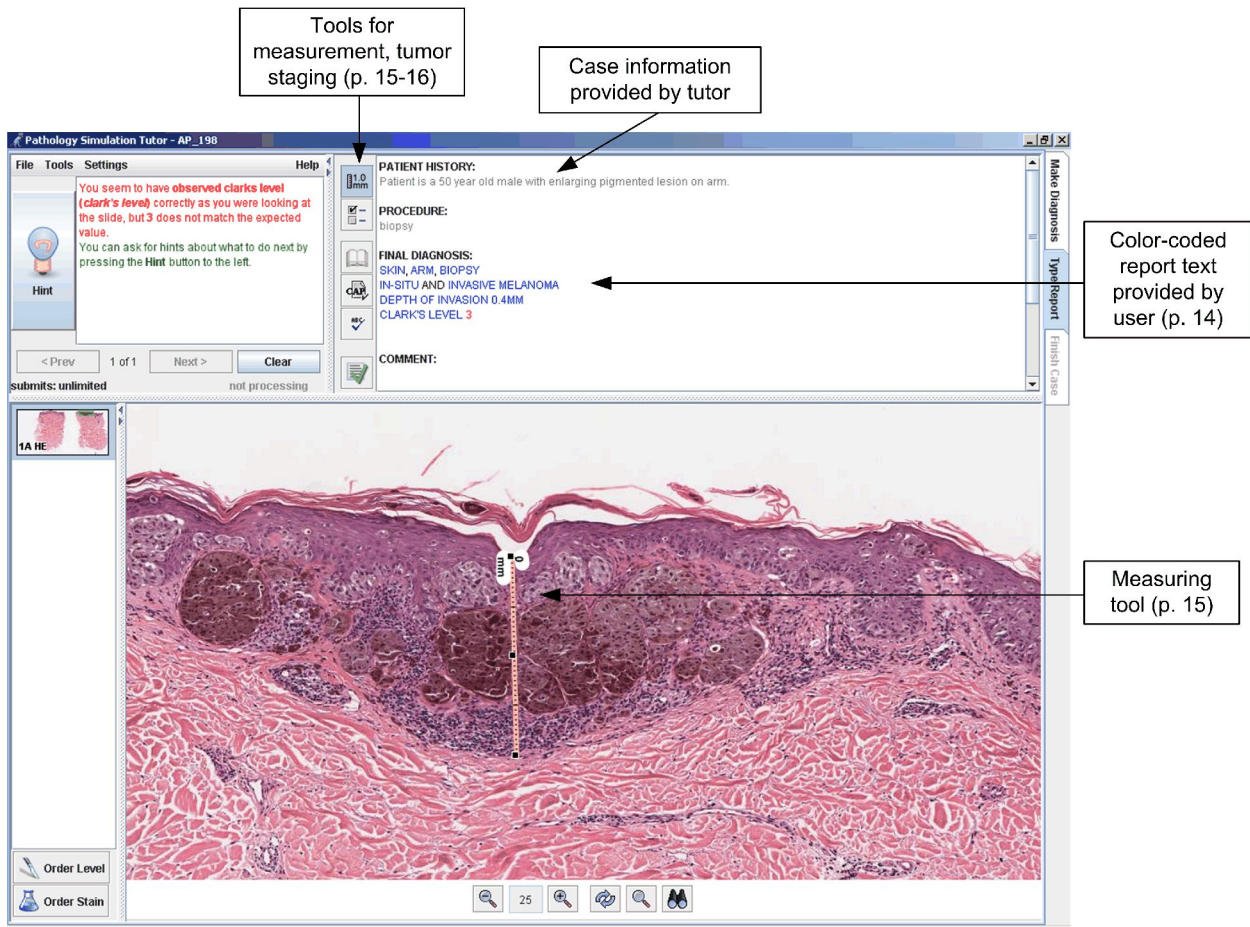
As long as you are making correct diagnoses, you will most likely be examining, diagnosing, and reporting these cases similar to how you would in your normal practice. However, if you make an inaccurate diagnosis and/or a critical diagnostic error, the system starts what might be considered tutoring or teaching activities. At this point, your examination of the case will cease to mimic your normal workflow. This is similar to how current CME activities may provide subsequent and necessary learning activities requiring more time.

Three tabs in the Tutor

You work through each case by providing information in three tabs in the program. The Make Diagnosis and Type Report tabs are pictured below.



Screenshot of Make Diagnosis tab



Screenshot of Type Report tab

Conventions Used in This Instruction Manual

“Click” means to click on the left button.

“Press” means to press and hold down the left mouse button.

“Right click” is used at times in selecting and will be noted as such.

Layout of SimTutor

When SimTutor opens, it is displayed in the horizontal layout. If you do not like this layout, you can change it in the Settings menu. There are two options in Interface Layout – horizontal and vertical. You can switch back and forth between these layouts at any time.

Resizing areas of the screen

In addition to changing the layout of the tutor, you can also resize areas of the screen. You can resize window panes that have the “dotted line” separation. If, for example, you want to make the Viewer bigger vertically, simply move your mouse over the dotted line separator. The icon changes to a two-way arrow pointing in the directions the area can be resized. Hold down the mouse button and move your mouse in the desired direction.

You can also collapse and expand areas of the screen by clicking the small blue arrows in the upper section on the dotted line bar. The areas will move in whichever direction the arrow is pointing.

Using the Virtual Microscope

SimTutor incorporates a virtual microscope that has similar functions as a regular microscope but operates using a mouse.

Moving around the slide

To move around the slide, press and hold the mouse button (the cursor changes to a four-way arrow). Drag the mouse, then release the mouse button. Repeat until the desired area is in view.

Zooming in and out

To zoom in:

Click the  button OR click the mouse over the image.


To zoom out:

Click the  button OR *right* click the mouse over the image.



You can also zoom in and out using the scroll wheel on your mouse when your mouse is over the image.

Refresh button



To return to the whole slide view, click the  button.

If the viewer is not refreshing, allow a few seconds for the new view to appear. If that does not help, click the  button and try using the viewer again – sometimes resetting the viewer helps.

Magnifier window

The Magnifier window provides a small window that shows a portion of the slide at a higher magnification. To open the Magnifier window, click the  button. The mouse cursor changes to a box. Move your mouse cursor over the slide to view different areas of the slide in the Magnifier window. To close the Magnifier window, click the  button again.

Navigator window

The Navigator window provides a smaller view of the entire slide that you can use to see where you are on the slide and to control what is displayed in the main window. To open the Navigator window, click the  button. The area of the slide you are viewing has a box around it. You can move to a different area of the slide using the Navigator window by clicking on a different area, or by dragging the box around by pressing and holding the mouse button and dragging the mouse. To close the Navigator window, click the  button again.

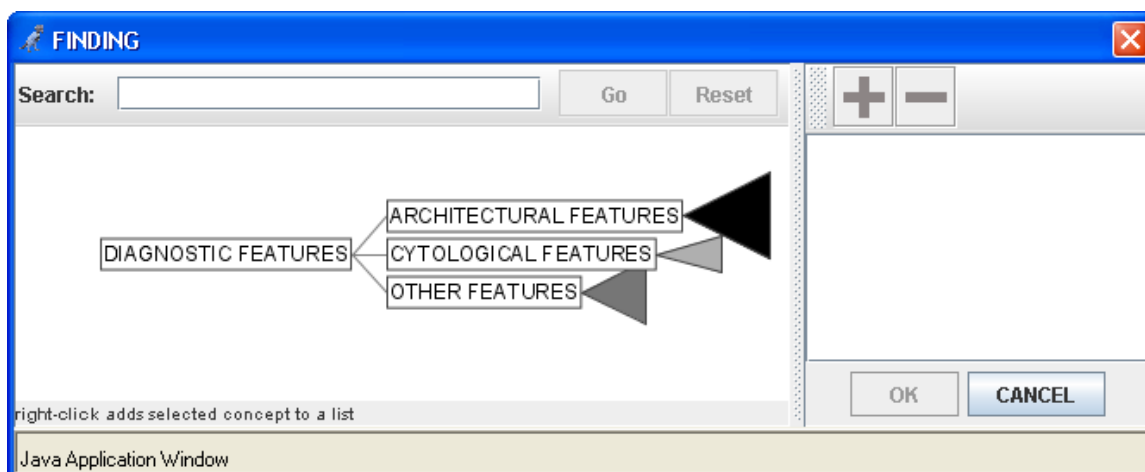
Areas of the slide that have been viewed are highlighted green in the slide list and in the Navigator window. With an increase in power, the shade of green darkens.

Using Menu Trees to Select Findings and Diseases

As you work with SimTutor, identifying findings and making hypotheses/diagnoses are accomplished through menu trees. The organization of these menu trees is described below as well as how to select and deselect items. Individual toolbar buttons are described in the next section.

Organization of findings (diagnostic criteria) and diseases

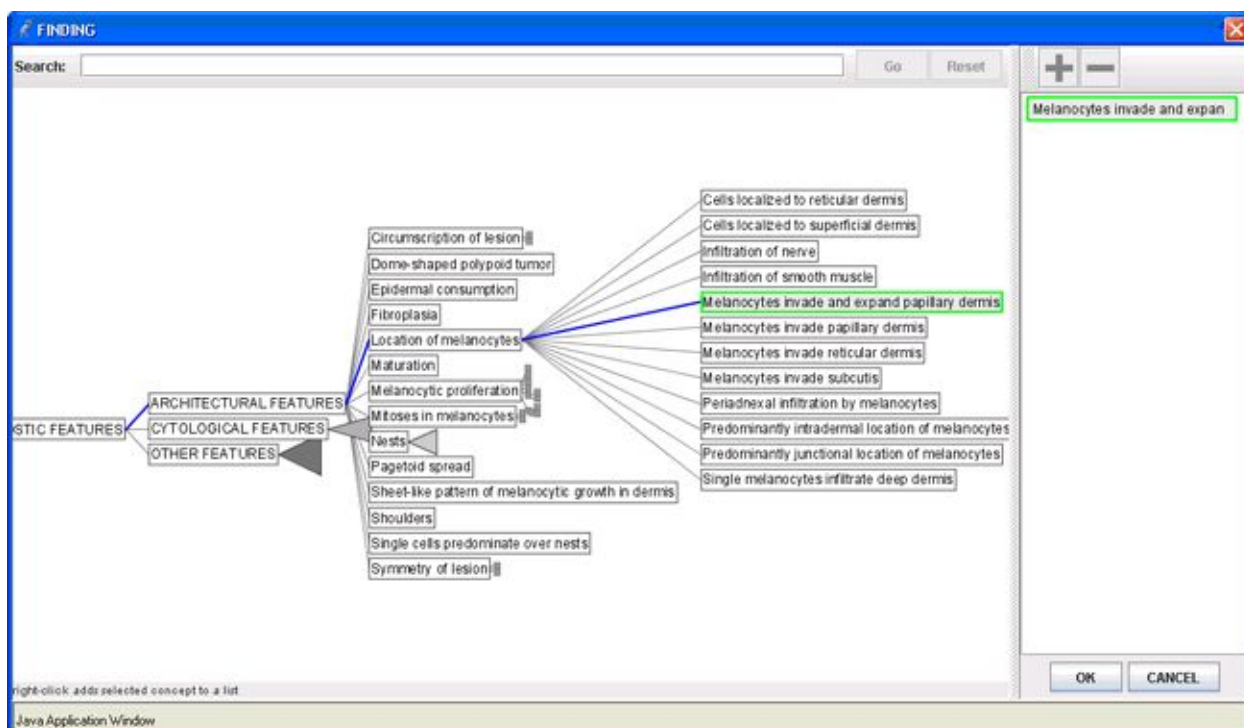
Diagnostic criteria, such as fibroplasia, melanocytic proliferation or cytologic atypia are arranged into three main groups in a branching tree that can be expanded. It is important to note that *prognostic* criteria, such as margin status will be asked to be noted in the reporting section of the tutor.



Diagnostic criteria are initially divided into architectural, cytologic and other “branches.” Diseases are divided into benign and malignant branches initially. Melanocytic nevus is further divided into different maturation levels and the corresponding nevi types associated with that given maturation level. Malignant melanoma is further divided into degrees of invasion and the corresponding histological types associated with a given degree of invasion. Within each branch, items are listed alphabetically. A complete listing of diagnostic criteria and diseases appear in Appendix 1 and 2 of this manual.

Locating items in the menu tree

There are two ways in which you can locate items in the menu trees: opening and closing the tree, or typing in a string to search for in the tree. To expand the tree, click a “branch” of the tree and that branch will open to display its contents. Branches that can expand are indicated by a triangle or rectangle on the right of the item. To open another branch, click on the expandable item.




Screenshot of Menu Tree for Findings with selection

Alternatively, you can have the program search the tree for a particular string of letters by typing the string and clicking “Go” or pressing the Enter key on your keyboard. The tree will highlight in orange any items containing that string. To go back to the original view of the tree, click the “Reset” button.

Note: you can zoom in and out of the menu tree by using the scroll wheel on your mouse when your mouse is over the tree.

Selecting an item from the menu tree

Either:

1. Click on the item to highlight it and click  to add the selection to the selection list


OR

1. *Right* click the item to select it.
2. Repeat step 1 to add additional items to the selection list as desired.
3. Click OK.

Even if the item appears to be highlighted from using the search tool, you still need to click the item to make sure it is selected.

Deselecting an item from the selection list

To remove an item from the selection list:

1. Click on the item to highlight it. Make sure you are in the selection list in the right portion of the menu tree screen.
2. Click  to remove the selection.
3. Click OK.


Make Diagnosis Tab

The first tab is used to examine the virtual slide and record a final diagnosis. You may also indicate relevant findings regarding diagnostic criteria. In monitoring your work, the tutor can provide feedback on diagnostic criteria you have identified and offer hints for identifying important diagnoses.

Toolbar Buttons

Present findings (diagnostic criteria)

To indicate the presence of a finding:

1. Click the  button.
2. Click the finding in the image to place an X at the location of the finding.
3. Select the appropriate finding from the menu tree that appears.

To describe findings:


1. *Right* click the text of the finding in Findings window.
2. Select “Describe Qualities” from the popup menu.
3. Select the appropriate description from the menu tree that appears.

If you misplace a finding X on the slide, you can move the X to a different area of the slide by holding down the mouse button and dragging the X to the correct location on the slide. When you mouse over a finding X, the name of the finding that X represents will appear on the screen.

Absent findings (diagnostic criteria)

For some cases, recognizing the absence of criterion is just as important in making the correct diagnosis as identifying criteria that are present.

To indicate that a finding is absent:


1. Click the  button.
2. Select the appropriate absent finding from the menu tree that appears.

Absent findings that you have identified display with the word NO in front of them to distinguish them from present findings. Also, the menu tree for absent findings has a shaded background to distinguish it from the present findings menu.


Hypotheses

As you are working through cases, it may be useful to you to generate a list of potential diagnoses that are relevant to the set of findings that you have identified thus far. In the tutor, these are called hypotheses.

To assert a hypothesis:

1. Click the  button.
2. Select the appropriate hypothesis from the menu tree that appears.

When selecting hypotheses and diagnoses, the tutor automatically adds the maturation level for nevi (junctional, compound, or dermal) and the degree of invasion for melanomas (in-situ, in-situ and invasive, or invasive) to your list of items. If an item is selected that you do not want to add, deselect it by clicking on the item in the selection

list and clicking the  button.

Making a diagnosis

In order to complete a case, you must record a final diagnosis.

To make a diagnosis:


1. Click the  button.
2. Select your diagnosis / diagnoses.

You can also make a diagnosis by dragging any asserted hypothesis down into the diagnosis area.

Note: There are several cases within the tutor where the maturation level of a nevus (COMPOUND NEVUS) or degree of invasion of a melanoma (IN-SITU AND INVASIVE MELANOMA) is sufficient for the final diagnosis. Therefore, there will be cases where the nevus type or histological type will not be required for you to come to the correct final diagnosis.

Glossary browser

The Glossary browser allows you to search for terms and obtain more information about them. It contains all findings, qualities of findings, diseases, and stains that are available

in the tutor. To open the Glossary browser, click the  button. The left-hand side of the glossary window displays the list of terms available, and the right-hand side will contain the glossary contents for whatever item is selected. When first opened, the glossary browser window will list all items in the glossary.

To search for a particular item, type the item in the “Search” field. The glossary list will contain any items related to the search term. For example, if you wanted to see a list of immunohistochemical stains the tutor recognizes, you can begin typing “immuno” in the search field and all of the stains will appear in the list. Click on an item in the list to view the glossary contents. All items contain a definition, and some findings will also include a picture. To view the whole picture, use the scrollbars if necessary. You can also see a larger view of the picture by double clicking on the picture. To close the larger image, click OK. Click OK to close the Glossary browser.

Case information button

To see the patient history and gross description for the case you are viewing, click the



button. The case information will appear in a pop-up window. Click OK to close the pop-up window.

Check diagnosis button

Once you are finished working through a case, you can click the button. The tutor will inform you that you are not done with a case if you have not reached the correct and/or complete diagnosis. The use of hints and mistake text to find a correct diagnosis is covered in the next section.

If you have reached the correct and complete diagnosis, the Type Report tab is activated. To move on to typing your report, click the Type Report tab.

Ordering levels and stains

At any time, you can order levels or stains if you want additional evidence from the case.

To order levels:



1. Click the button.
2. Place a check on the block you want to obtain the levels from.
3. Specify in the number of levels field how many levels you wish to order.
4. Click the Add to Order button.
5. Click OK.

To order stains:



1. Click the button.
2. Select the block you want to order stains for from the block dropdown list.
3. Begin typing the stain you want to order in the Immuno field. Select the intended immuno from the list of options that appear. (If the immuno is not found in the list, you can still order it, but the system may not recognize what you are trying to order.)
4. Click the Add to Order button.
5. Repeat steps 2-4 of the process if necessary.
6. Click OK.

If there aren't any representative slides available, N/A will appear in the Status column. If you do not click the Add to Order button and simply click the OK button, you will not be able to see the status of your order since clicking OK closes the order window. If you accidentally close the order window, you can see the status of your order by clicking either of the Order buttons again.

Any slides that are available will appear in the slide list on the left hand side of the screen. Click on the thumbnail to change slides.


Hints/Additional information

Asking for hints

An important feature of SimTutor is the ability to ask for suggestions about how to continue working through the case to arrive at the correct diagnoses.

To ask for a sequence of hints:



1. Click the  button.
2. Use the Next and Prev buttons to get more hints or to go back to a hint earlier in the sequence. You can also advance through the hints by clicking the “[more…]” hyperlink that appears at the end of the hint messages.

Once you ask for a hint, you must complete all the actions indicated in the sequence.

Glossary

The glossary is available to provide additional information about items on your screen. To access the glossary, simply *right* click the item in the Findings window and select “Glossary” from the options.

A popup window will appear with a definition of the term. Some findings also have a picture in the glossary. You can see a larger view of the picture by clicking on the picture. To go back to the smaller picture, click the picture again. To close the definition, click OK. Glossary information can also be obtained by using the Glossary Browser described earlier.

Colors of text

Normally, as you work in the Make Diagnosis tab, items that have been identified will be colored black. However, if you ask for a hint or make a critical diagnostic error, such as choosing an incorrect diagnosis, the system will switch to a different mode and provide feedback about everything you have done in the case. At this time, any items you have identified that are correct will be colored blue, and any items that are incorrect will be colored red. Hold the mouse over incorrect items and a box with yellow background will appear describing the mistake.

Report a problem

If you disagree with the final diagnosis of the case, you can move on to writing your report by selecting “Report a Problem” from the Settings menu. A popup window will appear where you can rate your frustration level and type any comments you have about the case. The Type Report tab will then be active.

Type Report Tab

Some of the same functions in the Make Diagnosis tab are available in the Type Report tab. For example, the virtual microscope, hints, and ordering levels and stains are all available in both of these tabs.

Findings and diagnoses selected in the Make Diagnosis tab are carried over to the Type Report tab. Your diagnosis will appear in the Final Diagnosis section, and any findings you identified will be listed under the Microscopic section of your report.

Typing a report

The top right side of the Type Report tab is where you type your report. Text that is gray can not be edited. The tutor only detects text written in the Final Diagnosis and Microscopic sections. You type your report much as you would in a word processor. Your goal is to create a complete final pathology report for the case you are viewing.

Colors of text

As you type, the system tries to extract useful information from your report. The text you type will turn different colors. These colors have important meanings and are described below:

Black text: Text that remains black indicates words not recognized as important by the system. This could be words such as “the” that do not have any importance to the overall content, or criteria that do not hold any prognostic value for a given case, such as “solar keratosis.” However, some text that is important to include in the report may not be recognized by the system and remain colored black. In that case, try rewording your text.

Blue text: Text that turns blue means it is something that is important to include in your report and the system recognized it.

Red text: Text that turns red means there is a mistake. An error message appears in red in the message area to the left.

Colored terms are treated as a single unit, not individual letters. When deleting these terms, the entire word will be deleted, not letter by letter.

Cut/Copy/Paste

Like a word processor, you can cut, copy, and paste text.

To cut or copy text:

1. Highlight the text you wish to cut or copy using your mouse.
2. *Right* click the mouse and select cut or copy.

To paste text:

1. Move your cursor to the location you wish to paste text.
2. *Right* click the mouse and select paste.

You may also use the keyboard short cuts to cut, copy and paste text.


Spelling suggestions

A spell checker is available to provide spelling suggestions.

To spell check a single word:

1. *Right* click the mouse over the misspelled word and select the correct spelling from the suggestions provided.

To spell check the entire report:


1. Click the  button.
2. Select the correct spelling from the suggestions provided and click “Change”.

Toolbar Buttons

Measuring tool

While writing your report, you may want to measure something on the slide. The measuring tool allows you to get a precise measurement.

To measure something on the slide:

1. Click the  button.
2. On the slide, press and drag the mouse to draw a ruler over what you wish to measure.
3. Release the mouse button.
4. Zoom in to a higher power to read the measurement precisely.


To lengthen, shorten, or rotate the ruler:

1. Press one of the endpoints on the ruler (there is a small black box on both ends of the ruler).
2. Drag the mouse to resize/rotate the ruler as desired.
3. Release the mouse button.

To slide the ruler over to a different location:

1. Press the midpoint on the ruler (a small black box is on the ruler).
2. Drag the mouse to slide the ruler to a new location as desired.
3. Release the mouse button.

You cannot draw more than one ruler on your screen at a time. If you have a ruler


drawn and deselect the  button by clicking it, the ruler will disappear. At that time, you can draw another ruler.

When typing a measurement into your report, you must type a number before the decimal point. For example, type “0.67mm”, not “.67mm”.

Tumor staging worksheet

The tumor staging worksheet is used in giving a final prognosis. In the worksheet, you can assess the primary tumor, regional lymph nodes, and distant metastasis stages.

To use the tumor staging worksheet:




1. Click the  button.
2. Click the appropriate radio buttons to select values.

Your selections will be appended to the end of your report in the Final Diagnosis section.

CAP Protocol

The College of American Pathologists created a protocol of relevant information to include in pathology reports of melanoma of the skin. The CAP protocol reproduces the melanoma protocol to aid you in writing a report.


To see the CAP protocol:

1. Click the  button.
2. Click the  and  buttons to view different pages of the protocol.
3. Type the information you would like to add in the Final Diagnosis or Microscopic sections of your report.

The protocol is a read-only file, and is provided only as a reference. Therefore, you cannot copy/paste any of the information from the protocol directly into your report.

Check report

Checking your report allows you to see how many prognostic criteria you have correctly identified in your report, how many you still need to include, and any outstanding problems that exist in your report. You can check your report an unlimited number of times. You must check your report at least once before you can move on to the Finish

Case tab. To check your report, click the  button. A report summary window will appear.

Errors

Text that turns red indicates a “mistake” in your report, based on recommendations from the CAP checklist as well as information the expert dermatopathologist included in his/her final report. A message appears in the message area in red text explaining the error. Error messages can also be viewed by mousing over the text.

If there is an error that you feel should not need to be fixed, you can use the “Ignore Mistakes” option, which is available when you *right* click a colored term.

Finish Case Tab


The Finish Case tab is where you can order a consult, list the 3 most important features to you in coming to a diagnosis in the current case, and move on to the next case.

Order consult


On the left hand side of the screen is the report that you wrote. On the right hand side, you can order a consult by clicking the Order Consult button. When you order a consult, a pathology report written by an expert dermatopathologist will appear.

List important features

Before moving on to the next case, you need to list the 3 most important features to you in coming to the diagnosis in the current case. You can type these features in the boxes listed at the top of the screen. Simply click your mouse in the boxes and type in the


features. Alternatively, if you click the  button before listing features, you will be asked to list the 3 most important features before moving on to the next case. You can click your mouse in the boxes to place your cursor, or tab from one box to the next.

Done button

When you click the  button, you will be asked if you want to finish the problem. Click Yes when you are ready to move on to the next case. The tutor will load the next case.

Known Issues

Virtual microscope slow down

Virtual slides are large and complex images. There are times where the viewer may slow and not refresh quickly. If this happens, please let the viewer sit for a few seconds to give it a chance to catch up. If that does not help, click the  button and try using the viewer again – sometimes resetting the viewer helps. If you try the above and nothing works, please contact the emergency help.

Tutor crash

Because the system runs off of a server, it is possible that the tutor may on occasion crash due to a server problem. If this happens, try closing it and opening up a new tutor session by logging back in. If the system does not load when logging back in, please contact the emergency help.

Selection of qualities

Identifying multiple values for qualities of findings is not understood by the tutor. For example, when specifying the quantity of pagetoid spread, the tutor will not understand putting both moderate and marked as quantities. Please add only one quality to your list of qualities for a given finding.

Correct diagnosis

The tutor considers a diagnosis complete and correct if it contains all items in the differential diagnosis. It does not matter to the tutor where a specific diagnosis was selected from. For example, if the correct diagnosis is “compound Spitz nevus”, and Spitz nevus was only selected in menus from the “junctional nevus” branch, the tutor will consider the diagnosis correct as long as both compound nevus and Spitz nevus are selected, even though Spitz nevus was selected from a different maturation level branch.

Typing measurements

When typing measurements with decimal numbers into your report, the system will not understand what is typed unless a number is typed before the decimal point. For example, instead of typing “.67mm”, you must type “0.67mm” for the system to recognize the measurement.

Hints not clearing

In the Type Report tab, the hint area does not always clear after the hinted action is performed. For example, if there are 5 hints in a sequence of hints and you perform all actions in the sequence once you have reached the 3rd hint, you will still receive hints 4 and 5 in that sequence. You can clear the hint area at any time by clicking the Clear button.

Green highlighting not the same in Navigator window and Slide list

Areas of the slide that have been viewed are highlighted green in both the slide list and the Navigator window. With an increase in power, the shade of green darkens. However, the highlighting that appears is not the same in both of these views. In the Navigator window, green highlighting only appears for areas of the slide viewed on power 25 or higher. Green highlighting appears on any power in the slide list thumbnails.

Frequently Asked Questions

Make Diagnosis Tab

What should I do if I don't see the entire image when a case loads?

If a slide does not seem to have loaded properly, try zooming in and panning around the slide. This should make the remainder of the slide appear on your screen.

How do I delete things?

You can delete findings, hypotheses, and diagnoses by *right* clicking the object you wish to delete, and selecting "Delete". To learn how to delete items while selecting in the menu tree, see page 9.

How do I qualify findings?


The tutor allows you to describe the qualities of findings, such as determining the quantity of a feature. Simply *right* click the text of the finding in the Finding window, select "Describe Qualities" from the popup menu, and select the appropriate description.

What if I misplace my yellow finding X? Can I move it?

If you place your finding X in the wrong part of the image, you have several options. You can cancel out of the action by clicking Cancel in the diagnostic findings popup menu window. Alternatively, you can still select your finding from the menu. You can move the X by holding down the mouse button and dragging the X to the correct location on the slide.

Why did the tutor put two hypotheses/diagnoses down? I only selected one disease from the menu.

When selecting hypotheses and diagnoses, the tutor automatically adds the maturation level for nevi (junctional, compound, or dermal) and the degree of invasion for melanomas (in-situ, in-situ and invasive, or invasive) to your list of items. If an item is selected that you do not want to add, deselect it by clicking on the item in the selection

list and clicking the  button.

Why has my finding/hypothesis/diagnosis changed color?


If the system detected a critical diagnostic error, the important diagnostic findings and hypotheses/diagnoses will turn from black to blue and any mistakes will turn red.

What if I disagree with something about the case? Is there a way for me to move on?

If you disagree with the final diagnosis of the case, you can move on to writing your report by selecting “Report a Problem” from the Settings menu. A popup window will appear where you can rate your frustration level and type any comments you have about the case.

Type Report Tab***Why didn't my text turn blue? I typed something that should be included in a report.***


Not all items in your report will be colored blue. Only items that hold prognostic value will be colored blue or red. Additionally, since the system is not a human, it does not understand all possible ways of wording things. If you type something that you believe is correct that is not recognized by the system, try wording it another way or just move on


to the Finish Case tab, which is activated after clicking the  button.

Why is the text sometimes red and sometimes black in the message area?

Red messages are error messages – they indicate a mistake in your report. Black messages are hint messages. Error messages appear automatically, but you must ask for hints if you want to find out suggestions for next steps.

How do I delete a ruler I drew on the slide? Can I draw multiple rulers?

To delete a ruler that is already drawn, simply deselect the  button by clicking it. You cannot have multiple rulers on your screen at one time, but you can draw as many rulers as you want while working through a case by deselecting and reselecting the


 button and drawing rulers.

Why does the tutor keep telling me to observe a finding on my slide? I looked at it already, but the system doesn't seem to have realized it.

When looking at slides in the system, you need to observe certain findings at a high enough power or the tutor will not consider them viewed. Additionally, the entire annotated shape needs to be observed. This generally comes up when observing margins since there are often a number of margins that need to be observed.

General***The virtual microscope is very slow and it doesn't seem to be refreshing. What should I do?***

Sometimes, the virtual microscope gets bogged down and does not refresh as quickly as it should. If this happens, please let it sit for a few seconds to give it a chance to


catch up. If that does not help, click the  button and try using the viewer again – sometimes resetting the viewer helps. If you try the above and nothing works, please contact the emergency help.

The system seems to have crashed. What should I do?

If the system crashes in the middle of use, try closing it and opening up a new tutor session by logging back in. If the system does not load when logging back in, please contact the emergency help.

My hints are stuck. Why does the tutor keep giving me the same sequence of hints as I ask for hints?

The tutor will not move to a new sequence of hints until the action it is expecting has been performed. If, for example, the hints indicate that there are intraepidermal nests to

identify on the slide, you need to explicitly perform that action by clicking on the  button, placing the X on the slide, and choosing “intraepidermal nests” from the menu tree.

How do I get additional information about findings and hypotheses on my screen?

If you *right* click a finding, hypothesis, or diagnosis and select “Glossary”, a popup window will appear that provides additional information about that concept. You can also use the Glossary Browser to obtain information about items in the tutor.


How do I switch what slide I am viewing?

If there are multiple slides listed in the slide list area on the left-hand side of your screen, click on the thumbnail of whatever slide you wish to view. That slide will now appear in the virtual microscope.

How do I check the status of my immuno or stains order?

The status of your order appears in the order window. If you accidentally close the order window, you can see the status by clicking either of the Order buttons.

How do I move on to the next case?

To move on to the next case, click the  button in the Finish Case tab. You will be asked to list the 3 most important features if you have not already done so. After you have listed 3 features, you will be asked if you are sure you want to finish the case. Click Yes, and the tutor will load the next case.

Why won't the tutor let me move on to the next case?

You can move on to the next case once the Finish Case tab has been activated. You cannot skip cases.

Emergency Help

If you experience a problem and closing and reopening the system does not help, please contact emergency help at 412-576-9181.

Appendix 1: Alphabetical listing of diagnostic criteria / findings in the Findings menu tree.

acanthosis of epidermis

A benign overgrowth of the stratum spinosum of the skin.

amelanotic fusiform cells

Fusiform cells without any melanin pigment.

apoptosis of nevus cells

A normal series of events in a cell that leads to its death.

asymmetry

A lesion that is not similar in appearance about a central axis. Asymmetry is determined by looking at the melanocytic component as well as the epidermis, pigment distribution, and host response.

atrophy of epidermis

Decrease in the size of a cell, tissue, organ, or multiple organs, associated with a variety of pathological conditions such as abnormal cellular changes, ischemia, malnutrition, or hormonal changes.

balloon cells mixed with melanocytes

Balloon cells are mixed with melanocytes.

banal melanocytes

bridging of nests

Nests of melanocytes that spans across several rete ridges.

cell size varies

Size of melanocytes vary.

cells localized to reticular dermis

The majority of melanocytes are confined to the reticular dermis.

cells localized to superficial dermis

The majority of melanocytes are confined to the papillary dermis and the upper reticular dermis.

cells uniform from side to side

The size of melanocytes is uniform from side to side.

circumscription of lesion

The definition of a lesion's peripheries.

cohesive nests

Nests that have well defined borders.

confluence of nests

A junction of several nests.

contiguous lentiginous proliferation

An increased number of melanocytes at the junction that line up next to each other.

cytological atypia

Cells that may have irregular size or shape, prominent nucleoli, or hyperchromatism.

deep mitoses in melanocytes

Mitoses of melanocytes occurring in the deep dermis.

dendritic melanocytes

dermal scar

The formation of new tissue in the process of wound healing.

disordered intraepidermal melanocytic proliferation

An increased number of melanocytes at the junction that do not follow the typical pattern of melanocytes.

dome-shaped polypoid tumor

A tumor that is dome-shaped and resembling a polyp.

dyscohesive cells in nests

Nests that do not have well defined borders. Often they have the appearance of cells falling out of the nest.

effacement of epidermal rete

Elimination of the rete pattern.

epidermal consumption

A lesion that appears to eat away at portions of the epidermis.

epidermal hyperplasia

An increase in the size of the epidermis and rete ridges.

fibroplasia

An increase in the connective tissue in the dermis.

fibrosis

Any pathological condition where fibrous connective tissue invades any organ, usually as a consequence of inflammation or other injury.

groupings of melanocytes in dermis

A group of melanocytes in the dermis.

hyperpigmentation of epidermis

An increase of pigmentation in the epidermis.

increased number of basilar melanocytes

Increased number of basilar melanocytes in the dermoepidermal junction.

infiltration of nerve

Melanocytes invading in and around nerve tissue.

infiltration of smooth muscle

Melanocytes invading in and around muscle tissue.

inflammatory infiltrate

The migration of inflammatory cells to the site of injury for the purpose of destroying, diluting, neutralizing, or isolating injurious agents.

intraepidermal nests

Nests of melanocytes in the epidermis- not confined to the dermoepidermal junction.

junctional clefts

A split in the dermoepidermal junction.

junctional nests

Nests of melanocytes confined to the dermoepidermal junction.

kamino bodies

Kamino bodies or eosinophilic globules have been shown through electron microscopy to be composed of bundles of filaments situated extracellularly.

lentiginous proliferation

An increased number of melanocytes at the junction.

location of melanocytes

Location of melanocytes.

maturation

Maturation is defined as a lesion that decreases in size with descent into the dermis. There is a reduction in both the size of the cells and the number of cells in a lesion.

melanocytes invade and expand papillary dermis

A large quantity of melanocytes in the papillary dermis that expand the appearance of the papillary dermis.

melanocytes invade papillary dermis

Melanocytes occupy all of or parts of the papillary dermis.

melanocytes invade reticular dermis

Melanocytes occupy the reticular dermis.

melanocytes invade subcutis

Melanocytes occupy the subcutis.

melanocytic proliferation confined to area above scar

A proliferation of melanocytes that appear just above an areas of scar.

melanocytic proliferation

A proliferation of melanocytes.

melanophages

A phagocytic cell which engulfs and contains melanin.

mitoses in melanocytes

A type of cell nucleus division by means of which the two daughter nuclei normally receive identical complements of the number of chromosomes of the somatic cells of the species.

mitoses in melanocytes in dermis

Mitoses of melanocytes occurring in the dermis.

mitoses in melanocytes in epidermis

Mitoses of melanocytes occurring in the epidermis.

multinucleate nevus giant cells

Multinucleate nevus giant cells

necrosis

The pathologic localized death of living cells, as from infection or interruption of the blood supply, generally associated with severe cellular trauma caused by progressive degradation by enzymes. Characterized by mitochondrial swelling, nuclear flocculation, and uncontrolled cell lysis, it is unprogrammed death of living tissue and cells.

nests connected by lentiginous proliferation

Junctional nests of melanocytes that are connected by a lentiginous proliferation.

nests predominate over single cells

The number of melanocytes in nests is greater than single melanocytes.

nests

Groups of melanocytes.

neurotropism

The involvement of perineurium and endoneurium of cutaneous nerves by melanocytes and neural differentiation. The term neurotropism also describes neural or schwannian differentiation in a pattern resembling peripheral nerve sheath tumors, such as neurofibromas or neuromas and the recapitulation of perineurium and endoneurium.

normal number of basilar melanocytes

A normal number of basilar melanocytes in the dermoepidermal junction.

nuclear hyperchromatism

The development of excess chromatin or of excessive nuclear staining especially as a part of a pathological process.

nuclear pleomorphism

Having nuclei with various distinct forms.

number of basilar melanocytes

A count of melanocytes along the basement membrane zone.

pagetoid spread

A scattering of melanocytes above the level of the rete ridges in the epidermis.

patchy inflammatory infiltrate

Several foci of inflammatory infiltrate.

periadnexal infiltration by melanocytes

Melanocytes surround periadnexal structures.

pigmentation

Coloration or discoloration of a part by a pigment.

pleomorphism

The quality or state of having or assuming various forms

poorly-circumscribed lesion

The lesion has poorly defined peripheries, where the intraepidermal melanocytic proliferation gradually diminishes at the lateral borders of the lesion.

predominantly intradermal location of melanocytes

A majority of the melanocytes (nested or single cells) are located within the dermis.

predominantly junctional location of melanocytes

A majority of the melanocytes (nested or single cells) are located within the dermoepidermal junction.

preserved rete ridges

The rete ridge pattern is observable.

proliferation downward along eccrine ducts around epithelium

Melanocytic proliferation downward along eccrine ducts around epithelium.

proliferation downward along eccrine ducts within epithelium

Melanocytic proliferation downward along eccrine ducts within epithelium.

proliferation downward along eccrine ducts

Melanocytes proliferate downward along eccrine ducts.

proliferation downward along follicles around epithelium

Melanocytic proliferation downward along follicles around epithelium.

proliferation downward along follicles within epithelium

Melanocytic proliferation downward along follicles within epithelium.

proliferation downward along follicles

Melanocytic proliferation downward along follicles.

prominent nucleoli

Nucleoli that are very conspicuous.

prominent pilosebaceous units

Pilosebaceous units are very conspicuous.

random atypia

Cytological atypia that occurs in random cells throughout the lesion.

reduced number of basilar melanocytes

Reduced number of basilar melanocytes in the dermoepidermal junction.

schwannian nevus cells prominent at base of lesion

Schwannian nevus cells prominent at base of lesion

sheet-like pattern of melanocytic growth in dermis

Sheet-like pattern of growth in the dermis.

shoulders

When the epidermal component continues laterally beyond the dermal component of a lesion.

single cells predominate over nests

The number of single melanocytes is greater than melanocytes in nests.

single melanocytes infiltrate deep dermis

Single cell melanocytes occupy the deep dermis.

solar damage

Pathological changes due to solar radiation.

solar elastosis

Repeated exposure to sunlight causes an increase of elastotic material in the upper dermis.

solar keratosis

A precancerous condition of thick, scaly patches of skin. Also called solar or actinic keratosis.

symmetry

A lesion that is similar in appearance about a central axis. Symmetry is determined by looking at the melanocytic component as well as the epidermis, pigment distribution, and host response.

thickened stratum corneum

Increased size of stratum corneum.

thickening of nail matrix

Thickening of nail matrix.

thickening of nailbed epithelium

Thickening of nailbed epithelium.

ulceration

The formation of a break on the skin or on the surface of an organ. An ulcer forms when the surface cells die and are cast off. Ulcers may be associated with cancer and other diseases.

uniform atypia

Cytological atypia that is consistent in cells throughout the lesion.

uniform size shape and placement of nests

Nests of melanocytes are uniform in size, shape and placement.

variation in size shape and location of nests

Nests of melanocytes are variable in size, shape and placement.

well-circumscribed lesion

The lesion has well demarcated lateral borders (nests or proliferation ends abruptly).

Appendix 2: Alphabetical listing of diseases in the Hypothesis and Diagnosis menu trees.

acral lentiginous melanoma

A form of melanoma occurring most often on the plantar, palmar, subungual, and periungual skin. It presents as a pigmented macular lesion with irregular borders. Morphologically, it consists of atypical spindled and dendritic melanocytes. The epidermis is often hyperplastic and there is pagetoid infiltration of the epidermis by anaplastic cells.

balloon cell nevus

The balloon cell nevus is a rare lesion which is clinically indistinguishable from an ordinary melanocytic nevus. Histologically, balloon cells are mixed with nevus cells throughout the lesion.

beckers melanosis

This rare pigmented lesion usually occurs on the upper back and is biopsied to rule out an atypical melanocytic nevus. Histologically, there is a proliferation of benign smooth muscle and it is believed that this entity may represent a spectrum with a smooth muscle hamartoma.

cafe-au-lait macule

Light brown pigmented macules associated with neurofibromatosis and Albright's syndrome.

common blue nevus

The common blue nevus is a small slate-blue to blue-black macule or papule found most commonly on the extremities.

compound nevus

A nevus composed of neoplastic melanocytes that infiltrate both the epidermis and the dermis.

congenital nevus

A lesion that is present at birth. Congenital nevi are found in approximately 1% of newborn infants. They are usually solitary, with a predilection for the trunk, although other sites such as the lower extremities and scalp may also be involved.

deep penetrating nevus

The deep penetrating/cellular blue nevus is a much larger lesion than the common blue nevus and is often found on the buttocks but sometimes on the scalp or the extremities.

dermal nevus

A nevus in which nests of melanocytes are found in the dermis, but not at the epidermal-dermal junction. Benign pigmented nevi in adults are most commonly intradermal.

desmoplastic melanoma

A melanoma of the skin characterized by a proliferation of atypical spindled melanocytes in the dermis, in a background of abundant collagen. It usually presents as an amelanotic raised nodular lesion.

dysplastic nevus

Solitary or multiple, slightly raised, pigmented lesions with irregular borders, usually measuring more than 0.6cm in greatest dimension. Morphologically, there is mild to severe melanocytic atypia and the differential diagnosis from melanoma may be difficult. Patients are at an increased risk for the development of melanoma.

ephelides

Ephelides are tanned macules found on the skin. They are usually multiple in number. With sun exposure, they become more apparent; therefore, in the winter months, they are often imperceptible. Although ephelides are predominantly benign, they may be seen in association with systemic disease.

halo nevus

A benign melanocytic nevus with a halo appearance.

in-situ and invasive melanoma

A melanoma of the skin that involves both the epidermis (in-situ) and the dermis (invasive).

in-situ melanoma

A melanoma that occurs in the epidermis only.

invasive melanoma

A melanoma of the skin where the melanocytic proliferation only occurs in the dermis.

junctional nevus

Mole found in the junction (border) between the epidermis and dermis layers of the skin. These moles may be pigmented and slightly raised, and have a higher risk of developing into malignant melanoma.

lentiginous nevus

The lentiginous nevus is a neglected entity which appears to represent the evolution of a lentigo simplex into a junctional and sometimes a compound nevus. It has also been called a nevoid lentigo and nevus incipiens. They are well-circumscribed, sometimes deeply pigmented, often quite small lesions, found most frequently on the trunk of adults between the ages of 20 and 40 years.

lentigo maligna melanoma

A melanoma of the skin characterized by single cell infiltration of the papillary dermis by atypical melanocytes, in a background of lentigo maligna changes.

lentigo simplex

Lentigo simplex is the most common form of lentigo. A single lesion or multiple lesions (lentiginos) may be present at birth or more commonly first develop in early childhood. Lentigo simplex is not induced by sun exposure, and it is not associated with any medical diseases or conditions. It is also referred to as simple lentigo and juvenile lentigo.

malignant blue nevus

A rare melanoma which develops in a pre-existing blue nevus. It occurs more frequently on the scalp, face, orbit, back, buttocks, extremities, hands, and feet.

mucosal lentiginous melanoma

An acral lentiginous melanoma affecting mucosal surfaces.

neurotized nevus

A nevus that histologically resembles spindled neural differentiation in bundles.

nevoid melanoma

A melanoma of the skin that resembles a benign nevus.

nevus of acral skin

A nevus that occurs on acral skin.

nevus of genital skin

Benign melanocytic nevi, localized on the genitalia or other particular body sites, which often display atypical clinical and/or histopathological features that may mimic melanoma.

nevus of ito

A neurocutaneous syndrome characterized by a bizarre, more or less symmetrical leukoderma with depigmented streaks, patches, and whorls, sometimes associated with hyperkeratosis follicularis. Associated disorders include seizures, psychomotor retardation, macrocephaly, and ophthalmological and other abnormalities.

nevus of ota

A macular lesion on the side of the face, involving the conjunctiva and eyelids, as well as the adjacent facial skin, sclera; oculomotor muscles; and periosteum. Histological features vary from those of a mongolian spot to those of a blue nevus.

nevus spilus

A lesion composed of small dark hyperpigmented speckles, superimposed on a tan-brown macular background. Lesions are present at birth or appear in childhood. As such, they have been regarded as a variant of congenital nevus. They may have a zosteriform or regional distribution. Rarely, lesions are widespread.

nodular melanoma

An aggressive form of melanoma, frequently metastasizing to the lymph nodes. It presents as a papular or nodular raised skin lesion. It comprises approximately 10-15% of melanomas. Morphologically, it often displays an epithelioid appearance.

pigmented spindle cell nevus

Pigmented spindle cell nevi are uncommon lesions but have a very distinctive clinical presentation: a well-circumscribed deeply pigmented papule, usually of recent onset, frequently located on the thighs of young adults.

recurrent nevus

Nevi that reoccur after a previous procedure. Histologically, there is a melanocytic proliferation above the dermal scar and possible below the scar.

sclerosing blue nevus

A type of blue nevus that is characterized by a prominent fibrous or sclerotic stroma.

solar lentigo

Solar lentigo are collections of pigment caused by exposure to the sun. The spots commonly appear on the hands, but can be almost anywhere, especially sun-exposed areas such as the face, back, arms, feet and shoulders.

spitz nevus

A benign compound nevus occurring most often in children before puberty, composed of spindle and epithelioid cells located mainly in the dermis, sometimes in association with large atypical cells and multinucleate cells, and having a close histopathological resemblance to malignant melanoma. The tumor presents as a smooth to slightly scaly, round to oval, raised, firm papule or nodule, ranging in color from pink-tan to purplish red, often with surface telangiectasia.

spitzoid melanoma

A melanoma characterized by the presence of malignant spindle-shaped melanocytes.

subungual melanoma

A malignant melanoma of the nail apparatus.

superficial spreading melanoma

A type of melanoma that typically occurs in light-skinned individuals ranging in age from young adults to the elderly. Risk factors include extensive sun exposure during childhood, a family history of melanoma, and the presence of dysplastic nevi.