

Supplement 226

**CONFOCAL MICROSCOPY**  
**DICOM WORKING GROUP-19**  
**DERMATOLOGY**  
**DRAFT FINAL TEXT**  
**EDITOR: LIAM CAFFERY**  
**NOVEMBER 2023**

# Letter Ballot

## Letter Ballot Comments



Comment (NB duplicate comments have been deleted)	Comment Author	Action
<p>Which Table A.1-1 Composite Information Object Module Overview will the two new IODs be added to? Please clarify.</p> <p>p.5, line 29: The supplement is missing an update to the IOD Module Overview Tables in PS3.3, section A.1.4 (e.g., Tables A.1-1a thru A.1-1d) [AGFA]</p>	Hologic	To be updated by editor.
Table A.X.1.3-1: Specimen is an Image/Instance level module, not a Patient level module.	Hologic	Corrected as per suggestion
A.X.1.4.3: In (121311, DCM, "Localizer"), Localizer should have double-quotes per convention.	Hologic	Corrected as per suggestion
Table A.X.2.3-1: Specimen is an Image/Instance level module, not a Patient level module.	Hologic	Corrected as per suggestion
A.X.2.4.3: In (121311, DCM, "Localizer"), Localizer should have double-quotes per convention	Hologic	Corrected as per suggestion
C.8.12.2.1: The section being updated is C.8.12.2.1.1 Image Center Point Coordinates Sequence.	Hologic	Corrected as per suggestion
C.8.12.2.1, line 138: " <u>andnominally</u> " needs a <space> "and nominally" per PS3.3-2023c.	Hologic	Corrected as per suggestion
C.8.12.2.1, line 141: " <u>theX</u> " needs a <space> "the X" per PS3.3-2023c.	Hologic	Corrected as per suggestion
C.8.12.2.1, line 150: " <u>theOrigin</u> " needs a <space> "the Origin" per PS3.3-2023c.	Hologic	Corrected as per suggestion

C.8.12.2.1, line 151: "increasefrom" needs a <space> "increase from" per PS3.3-2023c.	Hologic	Corrected as per suggestion
C.8.12.2.1, line 154: "apositive" needs a <space> "a positive" per PS3.3-2023c.	Hologic	Corrected as per suggestion
C.8.12.1.1, line 156: Is this supposed to be inserted after Figure C.8-17? Please clarify.	Hologic	Yes, added editorial instruction
TID 8300, row 18: CID BBBB title is not consistent, should be "Topical Treatments" <uppercase "T">.	Hologic	Corrected as per suggestion
Annex D: Code Meaning for DDDD does not match TID 8300 row 17 - which is correct, "Skin lesion color" or "Lesion color"?	Hologic	Corrected as per suggestion – Skin lesion color
- Annex XXXX, line 369: Table identifier is duplicated, remove extra instance.	Hologic	Corrected
- XXXX.4.1, line 413: In (121311, DCM, "Localizer"), Localizer should have double-quotes per convention.	Hologic	Corrected as per suggestion
- XXXX.5, lines 452-460: Where is content item CODE (121139, DCM, "Modality) in TID 8001? If this content item stays, Concept Code Sequence should be (CFM, DCM, "Confocal Microscopy").	Hologic	Modality removed - Modality was there previously as a condition. No longer necessary as we now have stains specific to confocal CID DDDD Specimen Stains for Confocal Microscopy
- XXXX.5, line 472: Missing open '('.	Hologic	Corrected as per suggestion
In Table C.8.XX.1.1.1-1 (page 15), there is a Defined Term of "NON-TILED" for the third Value of the Image Type (0008,0008) Attribute. However, the associated VR (CS = Code String) does not allow for storing a "-" (hyphen).	Observer	Corrected as per suggestion
In Table C.8.XX.2-1 (page 15), there is a superfluous column (no. 3) that should be removed. It is empty anyway.	Observer	Corrected as per suggestion

<p>n Table C.8.XX.4.1-1 (page 18), the value for the "Type" column is missing for the Frame Type (0008,9007) Attribute.</p>	<p>Observer</p>	<p>Corrected as per suggestion</p>
<p>On page 20 (line 243), the Keyword <u>ConfocalMicroscopyImageFrameType Sequence</u> contains a space character (between "Type" and "Sequence"), which is not allowed.</p>		<p>Corrected as per suggestion</p>
<p>Name of chapter (line 261) "Lesion Colors" is different to Table Label (Line 268) "Colors"</p>	<p>Austrian user group</p>	<p>Corrected as per suggestion</p>
<p>There is already a Context Group with defined color codes: CID 6067 Fluid Color This uses the same SNOMED CT Codes, but a Code Meaning including the word "color": E.g. SCT 371252007 Black color The code meanings in the two context groups should be aligned</p>	<p>Austrian user group</p>	<p>Added "color" to CID CCC Lesion <u>Colors</u></p>
<p>Line 202: Field of View Shape (0018,1147) and Field of View Dimension(s) (0018,1149) Both attributes are of type 1. Has it <u>be</u> considered to define these attributes type 2 to support also applications that cannot provide a value?</p>	<p>Carl Zeiss</p>	<p>Changed to Type 2 as per suggestion</p>

<p>It would be beneficial to have a more specific description for (0018,1149) like it is in all other places in the Standard where this attribute has already been used, e.g. from DICOM PS3.3, Table C.8-11.</p> <p>“Dimensions of the field of view, in mm. If Field of View Shape (0018,1147) is: RECTANGLE: row dimension followed by column.”</p>	<p>Carl Zeis</p>	<p>Changes made as per suggestion</p>
<p>Line 217: &gt;Frame Type (0008,9007) No type is given in the Type column.</p>	<p>Carl Zeis</p>	<p>Type 1 added</p>
<p>p.15, lines 184-185: These lines indicate the tables are the defined terms. Just thinking it might be better if they were Enumerated Values (as I <u>doubt</u> we want/ expect extensions except those that come through the DICOM WGs. In fact, Table C.8.XX.1.1.1-2 states: "No other values may be present.", which indicates these really ARE enumerated values.</p>	<p>AGFA</p>	<p>After discussion at last WG-06 meeting decision was to leave as is with David's approval. Consistent with whole slide imaging <a href="https://dicom.nema.org/medical/dicom/current/output/chtml/part03/sect_c.8.12.4.htm">https://dicom.nema.org/medical/dicom/current/output/chtml/part03/sect_c.8.12.4.htm</a>  </p>
<p>p.16-17, line 202, Table C.8.XX.3-1, Tacking ID and Tracking UID rows: The conditions on these rows are co-dependent, which will effectively make them both Type 3 (rather than 1C). Is there some other real-world condition that is worth adding that would provide incentive to the creators of such images to include this information? If not, suggest making <u>these type 3</u>. Alternatively, if they are important enough, simply make them both Type 1.</p>	<p>AGFA</p>	<p>No consensus after considerable discussion across multiple WG-06 meeting. Intention is if one is present both need to be present. Avoid making Type 3. Leave as 1C consistent with dermoscopy supplement.</p>

<p>p.24, <a href="#">lines</a> 324-332, TID FFFF: This new TID is being created, but is not used/ invoked from anywhere (at least not in this supplement), and it is not a Root level TID. Unless it is included/ invoked from somewhere, suggest removing it.</p>	<p>AGFA</p>	<p>Invoked from Specimen Preparation Step Content Item Sequence</p> <p>Added the following as per discussion in last WG-06 meeting.</p> <p><b>A.X.1.4.6 Specimen Module</b>  The Defined TID for Specimen Preparation Step Content Item Sequence (0040,0612) is TID FFFF “Specimen Staining for Cutaneous Confocal Microscopy”.</p>
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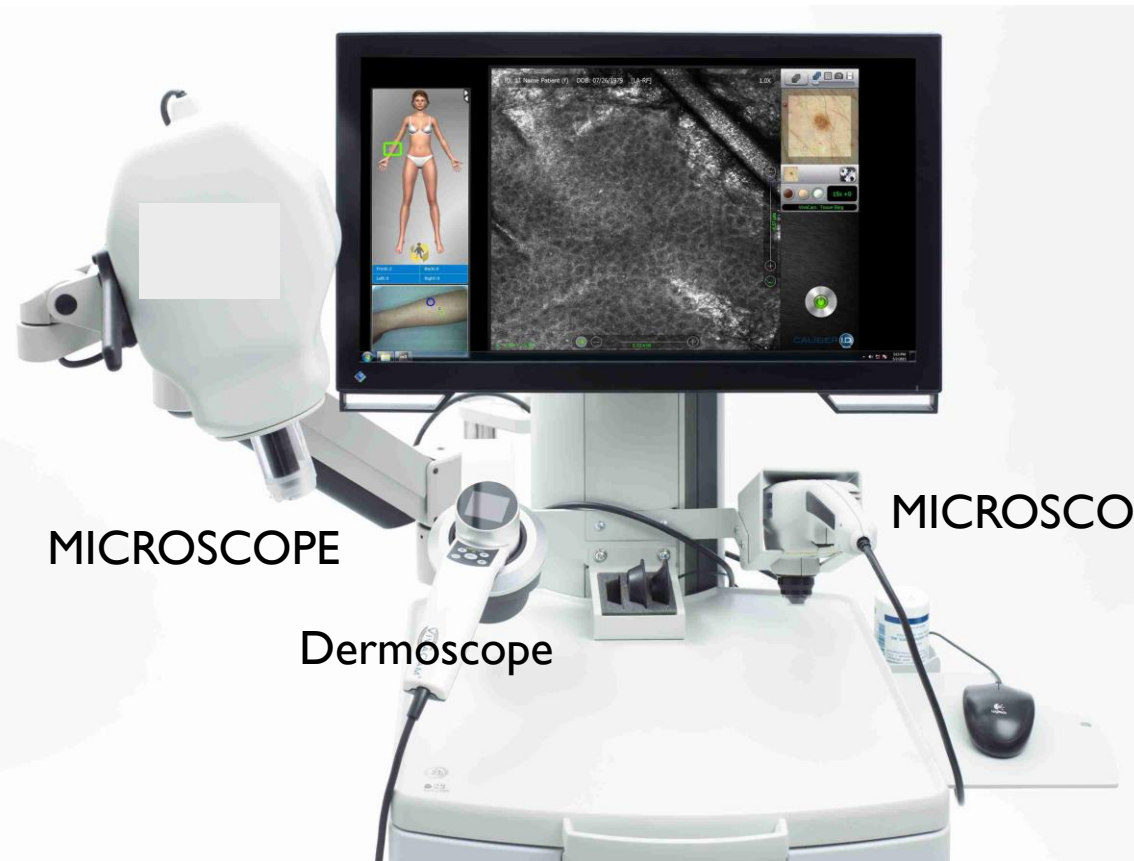
# Confocal microscopy

- Non-invasive imaging technique
- Can be done in-vivo or ex-vivo
- Used for the diagnosis of range of skin disease with an emphasis on melanoma
- Precise diagnosis in difficult lesions



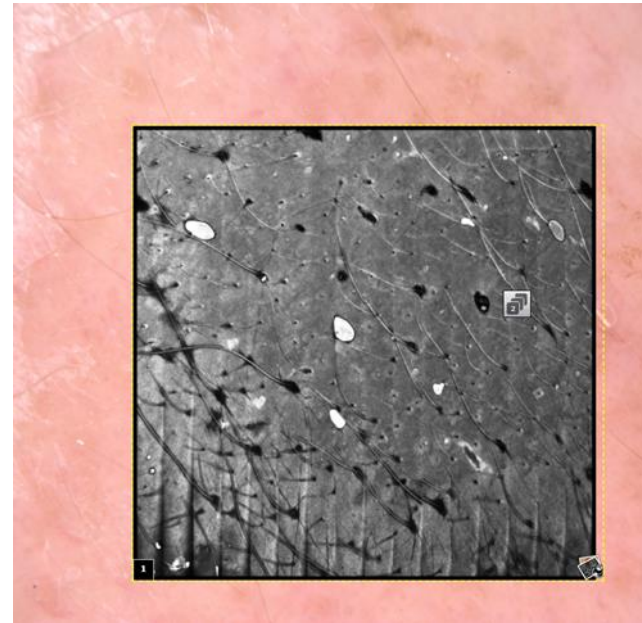
## In-vivo confocal microscopy

- Allows examination of the skin at resolutions comparable to histology without performing a biopsy
- Virtual biopsy
- Adjunct to dermoscopy (or clinical imaging)
- Acquisition in reflectance mode

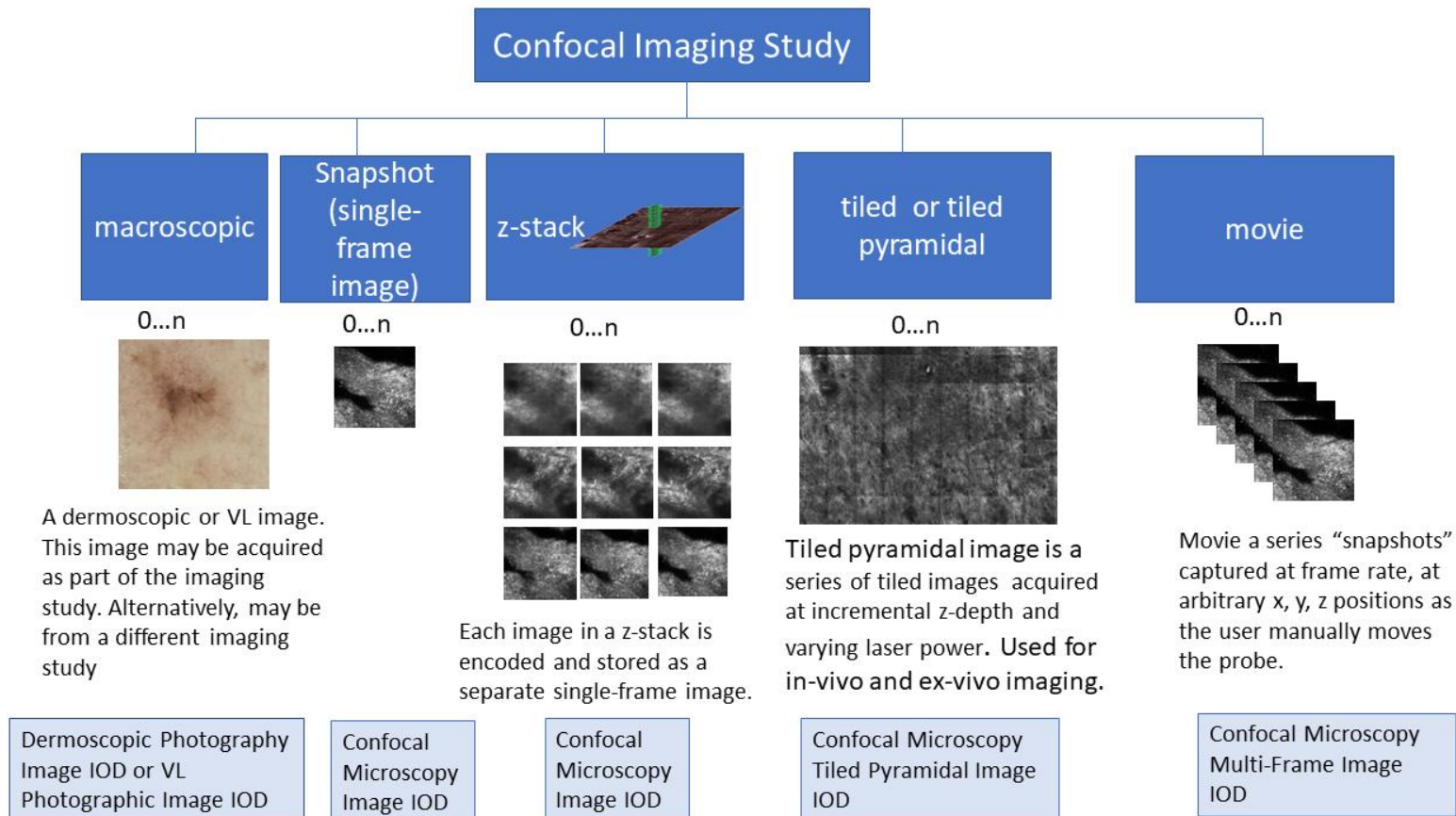


## In-vivo confocal microscopy acquisition

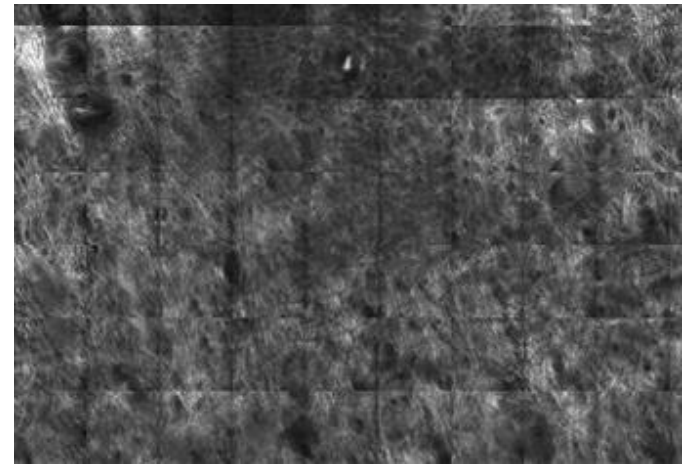
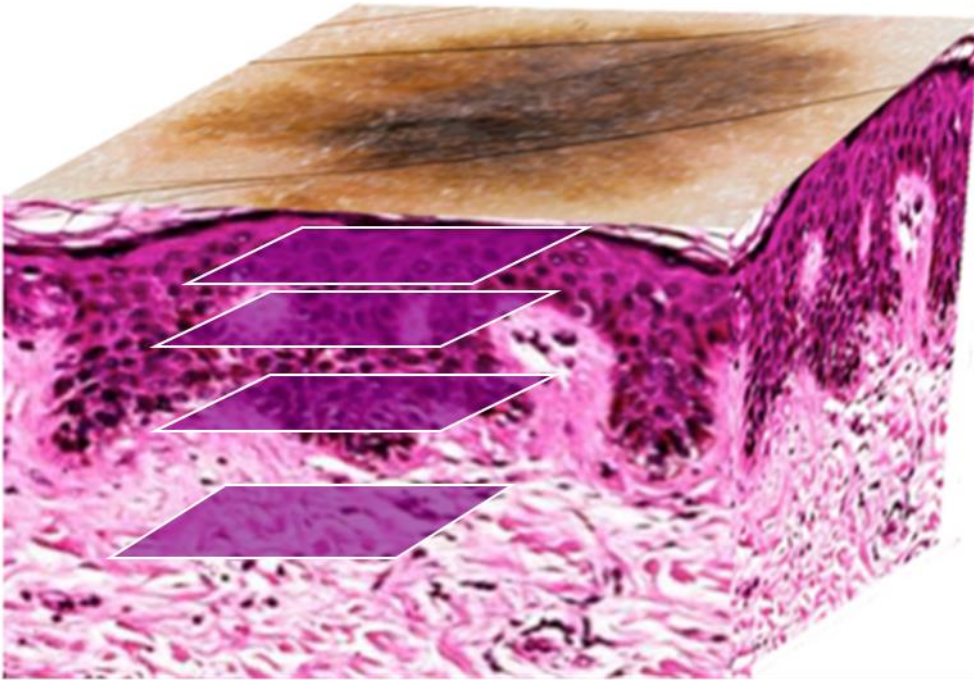
- Window attached to skin
- Dermoscopic image acquired
- Confocal microscope placed in window
- User interface: Acquisition area drawn on dermoscopic image
- Stage co-ordinate are transmitted to confocal microscope



# In-vivo confocal microscopy acquisition types



# Tiled pyramidal or Mosaic Stacks



## Ex-vivo confocal microscopy

- Freshly excised tissue
- Fluorescent stain
- Acquisition in Reflectance or Fluorescence modes



## Ex-vivo confocal microscopy acquisition

- Mount specimen on slide and flatten +/- relaxing cuts (there is no barcode on the slide)
- Adjust the intensity of the colors in the whole specimen by increasing or decreasing both ( fluorescence and reflectance) laser powers.
- Select the area of scanning of the sample according the macroscopic image
- Slide is discarded after imaging

## Changes resulting from Public Comment

- Name change to Cutaneous Confocal Microscopy
- Addition of Cutaneous Confocal Microscopy Image Acquisition Parameters Module which stores dermatology-specific information
- Confocal Microscopy Image Module and Confocal Microscopy Tiled Pyramidal Image Module re-usable and/or extensible for other applications
- NO mandatory dermatology-specific content