



**ICC Medical Imaging Working Group
Webinar
October 25, 2013**

The meeting was called to order at 10:00 am (EDT) by Craig Revie, chair with the following in attendance:

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| Pinky Bautista | MGH PICT center |
| Andrew Casertano | American Dental Association Consultant |
| James Chang | Sharp Laboratories |
| Wei-Chung Cheng | Food and Drug Administration |
| Max Derhak | Onyx Graphics |
| Michael Flynn | Henry Ford Health System |
| Yves Vander Haeghen | Universitair Ziekenhuis Gent |
| Stephen Hewitt | National Cancer Institute |
| Po-Chieh Hung | Konica Minolta |
| Sharon Johnson | The Sharden Group, Inc. |
| Tom Kimpe | Barco nv |
| Elizabeth Krupinski | University of Arizona |
| Florian Knicker | Panasonic Frankfurt Laboratory |
| Takashi Matsui | Eizo Corporation |
| Masahiro Nishibori | International University of Health and Welfare |
| John Penczek | NIST |
| Craig Revie | Fujifilm |
| Christye Sisson | Rochester Institute of Technology |
| Stein Olav Skrøvsseth | University Hospital of North Norway |
| Hong Wei | Datacolor |
| Dave Wyble | Avian Rochester, LLC |
| Yukako Yagi | MGH/Harvard Medical School |
| Masahiro Yamaguchi | Tokyo Institute of Technology |

Following introductions, Mr. Revie proceeded to review the agenda for the meeting as follows:

1. Brief update on consensus paper (Aldo Badano)
2. Progress update and plan for each work item
3. First face-to-face meeting in Vancouver (18th November)
4. Ways to make better progress on work items

5. Identification of useful resources
 - Task force mailing list (Debbie Orf0)
6. Next meeting/teleconference

The agenda was approved as submitted.

1. Brief update on consensus paper

Craig Revie reported that as Aldo Badano and Wei-Chung Cheng work for the U.S. Food and Drug Administration the consensus paper has been slightly delayed due to the US government shut-down. However, it is anticipated that final draft will be circulated shortly for review prior to publication.

2. Progress update and plan for each work item

Mr. Revie reviewed the candidate work items as shown in Attachment A.

a. Calibration slide for histopathology (Revie)

Mr. Revie reported that a working group has been formed; they have had two teleconferences and are making progress. A project scope has been defined along with an initial set of rules for participation. A first draft of a paper titled "Digital microscope test materials and test methods" has been circulated within the group for review and comment. The first face-to-face meeting of this group will be held at the November meeting in Vancouver where half of the first day will be devoted to this topic.

b. Medical RGB Color Space – MRGB (Flynn)

Mr. Flynn reported that this initiative defines to a color space document a medical RGB color space that would include white point color space luminous response, luminous ratio and viewing conditions. Work is progressing in collaboration with the American Association of Physicists in Medicine (AAPM) who plan to release the document as part of its task group on color display. All appropriate committee approvals to proceed with the project have been received. Initial drafts will be available for review at the next joint meeting of the AAPM task group and the IEC maintenance team on color display that has been looking at white point and white point tracking. After that meeting a copy will be distributed to the ICC Medical Imaging Work Group for discussion in Vancouver.

c. Multispectral Imaging (Yamaguchi)

Mr. Yamaguchi reported that there has been no progress since the last meeting. Max Derhak will make a presentation regarding Multispectral Imaging at the Vancouver meeting. He stated that his presentation will provide a review of what is currently being done in the ICC using features and relationships that are pertinent to medical imaging.

d. Colour support for mobile devices (Masia)

Mr. Revie reported that Andy Masia has prepared an overview paper for internal discussion within X-rite which will be shared with the group during the Vancouver meeting.

e. Calibration standard for ophthalmology (Sisson)

Ms. Sisson reported that she will be unavailable for the Vancouver ICC meeting due to a conflict with a meeting of Ophthalmologists being held in New Orleans on the same date. Since the experts she has been in contact with will also be attending they have planned a face-to-face meeting while there to discuss this topic. A report will be provided after the meeting that can be posted to the ICC website. Ms. Sisson has been working with color scientists at RIT to develop a paper to identify components of the color chart for testing. She is waiting to hear from camera vendors to see if there is interest in being involved with the working group and will network with them during the meeting in New Orleans.

f. Colour in dental photography (Casertano)

Mr. Casertano will attend the ADA meeting next week where they will be working on Technical Report 1050 *Implementation guidelines for DICOM and dental photography*. It is anticipated that a summary of this TR will be provided for the November ICC meeting.

**g. Best practices for digital photography in medicine (Penczek)
Best practice papers for colour in DICOM (Casertano)
DICOM camera raw support and EXIF tags (Clunie)**

Mr. Revie suggested grouping these 3 topics together as they are related. Mr. Penczek agreed in principle and stated that these topics are all still in the organizational phase. The next steps are to form an initial group of people with an interest in developing best practice guidelines, and then discuss what to include in the scope. Should the group be all-inclusive or is the topic is too large for one task group to handle. Mr. Revie stated that there are members of the ICC with a broad experience of color management for digital photography which will be a valuable resource. It was suggested that a discussion on scope and potential outlines for documents be included during the November meeting. It was noted that color medicine guidelines are currently available for download on the ATA website (<http://www.americantelemed.org/practice/standards/ata-standards-guidelines>). Mr. Revie suggested that links to these documents and other related activities can be placed on the ICC website.

Action Item: Green to place a link to the ATA Standards and Guidelines on the ICC website.

h. Open source reference implementation (Clunie)

Mr. Revie reported that David Clunie has completed work with the open source viewers and is satisfied that it is a straight-forward task to integrate ICC color management. The idea behind the project is to add a formal way to add ICC support for these viewers. Many viewers are implanted in Java which are based on an old Kodak product and could be updated. This topic will be discussed further during the ICC meeting in Vancouver.

4. First face-to-face meeting in Vancouver (18th November)

Mr. Revie reviewed the draft agenda which was circulated prior to the meeting (see Attachment B). It was noted that if you plan to attend the meeting, either in person or remotely, it is requested that you return a response form indicating your attendance.

5. Ways to make better progress on work items

Individual mailing lists were suggested as a way to help with communication as it can be difficult to make progress with teleconferencing alone, another suggestion was to use the ICC Medical Imaging Work Group mailing list. Ms. Sisson suggested having a shared drive such as Dropbox or Google docs for collaboration. It was noted that Phil Green has offered to maintain a webpage on the ICC website where versions of documents can be made available for individual groups. This would require using email to share documents which Mr. Green would then pick up and post on the website. It was agreed that individual groups should use whatever application they prefer for sharing documents while under development; the ICC website can then be used as a central repository for work items to exist together and allow groups to monitor all of the work being done within the MIWG and address any overlap that may occur.

6. Identification of useful resources

Mr. Revie encouraged the leaders of work items to contact Debbie Orf to create individual mailing lists if that would be helpful for groups to facilitate communication. There are alternative methods of communication that can be provided through the ICC website which would be handled by Mr. Green. If a group would like to arrange a teleconference the leader should contact Debbie at dorf@npes.org to arrange. A GoToMeeting can be scheduled and recorded and minutes can be provided after the call if necessary. This will be discussed further at the meeting in Vancouver.

7. Next meeting/teleconference

The next meeting of this group will be the face-to-face meeting in November. It was suggested that a regular schedule of teleconferences be arranged going forward. After discussion it was agreed that the third Friday of each month be set aside for regular meetings. It was suggested that each month should be devoted to a single topic rather than try to cover the entire range of work.

Action: Orf/Revie to provide a proposal for regular schedule of topic-specific meetings

8. Adjourn

There being no further business, the meeting adjourned at 11:02 a.m.

Respectfully submitted,



Debra K. Orf
ICC Secretary

Status and next steps for candidate work items

- **Calibration slide for histopathology** (Craig Revie)
- **Medical RGB Color Space – mRGB** (Michael Flynn)
- **Multispectral imaging** (Masahiro Yamaguchi)
- **Colour support for mobile devices** (Andy Masia)
- **Calibration standard for ophthalmology** (Christye Sisson)
- **Colour in dental photography** (Andrew Casertano)
- **Best practices for digital photography in medicine** (John Penczek)
- **Best practice papers for colour in DICOM** (Andrew Casertano)
- **DICOM camera raw support and EXIF tags** (David Clunie)
- **Open source reference implementation** (David Clunie)
- **Connectathon to check colour capability** (future)
- **Wiki for test images for all modalities** (future)

Calibration slide for histopathology participants

| Company / Organisation | Primary contact name | Primary contact email | Status | ICCWG |
|-------------------------------|----------------------|---------------------------------|-----------------------------|-------|
| FFEI Limited, ICC | Craig Revie | craig.revie@ffei.co.uk | ICC project coordinator | Y |
| GE Omnyx | Michael Montalto | Michael.Montalto@omnyx.com | Vendor representative | |
| Philips | Bas Hulsken | bas.hulsken@philips.com | Vendor representative | |
| Roche Ventana | Scott Forster | scott.forster@ventana.roche.com | Vendor representative | Y |
| Leica / Aperio | Allen Olson | allen.olson@leicabiosystems.com | Vendor representative | |
| GE Omnyx | Vipul Baxi | Vipul.Baxi@omnyx.com | Vendor representative | |
| NIH, NCI | Stephen Hewitt | hewitts@mail.nih.gov | Organisation representative | |
| FDA | Aldo Badano | Aldo.Badano@fda.hhs.gov | Organisation representative | Y |
| FDA | Wei-Chung Cheng | Wei-Chung.Cheng@fda.hhs.gov | Organisation representative | |
| GE Omnyx | Michael Meissner | Michael.Meissner@omnyx.com | DICOM WG26 Chair | |
| MGH / Harvard | Yukako Yagi | YYAGI@PARTNERS.ORG | Research participant | |
| MGH / Harvard | Pinky Bautista | PBAUTISTA@PARTNERS.ORG | Research participant | Y |
| Leeds Hospital | Darren Treanor | darrentreanor@nhs.net | Research participant | Y |
| Hamamatsu | Scott Blakely | SBlakely@hamamatsu.com | Vendor representative | |
| Sakura Finetek | Megumi Kondo | m.kondo@sakura-finetek.com | Vendor representative | |
| XRite | Tom Lianza | TLianza@Xrite.com | Vendor representative | |
| 3D Histech | Viktor Varga | viktor.varga@3dhitech.com | Vendor representative | |
| Tokyo Institute of Technology | Masahiro Yamaguchi | yamaguchi.m.aa@m.titech.ac.jp | Research participant | Y |

Calibration slide for histopathology

Problem statement

One reason for differences in whole slide imaging is the lack of a suitable calibration process which means that the same slide can look very different from system to system.

Proposal

Vendors that have worked in this area should pool their resources to develop a calibration system for digital microscopes.

Current status

- Project scope has been defined
- Rules for participation have been agreed by the group (some questions remain)
- First draft of ***Digital microscope test materials and test methods*** white paper has been circulated for comment
- Plan to hold first face-to-face meeting on November 18th in Vancouver with the aim of agreeing document content and structure are starting to address some of the technical issues

Medical Imaging Working Group agenda

Vancouver, 18th November 2013

The provisional agenda for the Medical Imaging Working Group meeting is shown below. Please note that not all of the titles of the presentations are final and also not all presenters have committed to attending the meeting in the medical photography session. In looking at the list of registered attendees I note that many represent manufacturers of measurement instruments (CRite, Konika Minolta and datacolor) which may be useful for our discussion.

Please email Craig Revie (craig.revie@ffe.co.uk) if you have any additional items for the agenda or if you would like to change an existing agenda item.

Calibration slide for pathology

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| Introduction | Craig Revie / Aldo Badano |
| Colour calibration of digital pathology systems | Yukako Yagi |
| GE/Omnyx calibration proposal | Michael Montalto |
| Calibration of Leica ScanScope AT2 | Allen Olson |
| Calibration based on IT8.7/3 | Viktor Vargo |
| Philips digital microscope calibration | Bas Hulsken |
| Contents and structure of calibration materials and test methods | Craig Revie |
| <i>Discussion of next steps (one hour minimum)</i> | |
| Multispectral imaging extensions | Max Derhak |

Display calibration

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| Introduction | Craig Revie |
| Review of mRGB proposed standard | Michael Flynn |
| Proposal for calibration target for medical color display systems | Tom Kimpe |
| Research proposal to assess the impact of colour calibration on diagnostic accuracy | Elizabeth Krupinski |
| Requirements and overview of current state-of-the-art colour calibration for mobile devices | Andy Masia |

Medical photography

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| DICOM camera raw support and EXIF tags | [David Clunie] |
| Best practices for digital photography in medicine | John Penczek |
| Calibration standard for ophthalmology | Christye Sisson |
| Requirements for dental photography | Andrew Casertano |
| <i>Discussion of next steps</i> | |

Other topics

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| Review of ICC usage by DICOM | Phil Green / David Clunie |
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