# How to Guide for Micrographic Surgery and Reconstruction

# **Comprehensive Evaluation Form**

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### 1. Overview

This How to Guide aims to assist Program Directors in using the optional comprehensive evaluation form when evaluating fellow competency in Mohs Surgery and reconstruction. The entire evaluation can be used in the most basic format of direct observation. If your program has access to a video camera, it is the recommended modality to evaluate procedural skills. There are detailed resources on video equipment and set-up below.

The left side of the evaluation form lists the skill sets in sequential order with a simple rating scale. Each skill set is broken down into meaningful components that may or may not be relevant to each practice or patient. To keep it simple, the component mini boxes are only to be checked if there is a deficiency. The last column on the right gives a recommendation for the format of evaluation, although the entire evaluation can be performed using direct observation.

Watch the video with the fellow discussing strengths and weaknesses as they unfold. Pause, replay, or fast forward when needed giving verbal feedback while circling numbers for the rating scale and checking component boxes that need attention. This optional form could be useful in completing the biannual ACGME milestones report.

The suggested goal would be to use the evaluation form once a month targeting different tumor types and different reconstructions. Evaluation of increasingly advanced repairs should occur as the year progresses. If there is a significant deficiency in an evaluation, the same repair type could be evaluated again at a different time point to assess improvement. The provided list of repair types with a column for date can be used to track repair types and ensure variety.

For programs planning to use video, there is a sample consent form at the end of this document. This form is only an example and programs should go through accepted protocols for legal approval of consent forms at their respective institutions.

Once you have obtained all of the equipment necessary to assemble a video capture system, and you are prepared to begin, keep in mind that there will still be a learning curve associated with the process. Through practice and learning by changing lighting, settings, and positions, your video quality will continue to improve.

# Micrographic Surgery & Reconstruction Comprehensive Evaluation Form

# Reconstructive Procedures for Fellowship Video Evaluation

(Recommendation to perform this evaluation once a month targeting different reconstructive options)

Date	Repair Type
	Complex Repair
	Advancement Flap
	Unilateral or Bilateral
	Island Pedicle Advancement
	Rotation Flap
	Unilateral
	Bilateral/Peng
	O to Z
	Transposition Flap
	Rhombic
	Bilobe/Trilobe
	Tunneled
	Cartilage Graft
	Staged Pedicle Flap
	Melolabial
	Forehead
	Mastoid Pedicle
	FTSG
	STSG
	Multi- subunit Reconstruction
	Other:

# Micrographic Surgery and Reconstruction Comprehensive Evaluation Form

Fellow Name:							_Location:		
Evaluator Name:							Tumor Type:		
Date:							Procedure(s) Evaluated:		
	SKILL	RATIN (5 is th	G SCA ie hig	ALE hest)			COMPONENTS (Check Boxes Where Improvement is Needed, Not Every Component is Relevant to each Practice/Case)	RECOMMENDED EVAL FORMAT	
Informed Consent		1	2	3	4	5	□ Review of HPI, PMhx,ROS, Meds □ Physical Exam □ Lymph Node Exam □ Imaging Reviewed/Ordered □ Oncologic Tumor Description (Epidemiology, Genetics, Staging/Prognosis) □ Procedure Description □ Address if Possible Need for Multi-disciplinary approach □ Procedure Risks and Alternatives □Prophylactic Antibiotics □ Interpreter Services	Direct Observation	
Site Identification		1	2	3	4	5	□Verify Site □Dermoscopy □Accuracy □ Photographs	Direct Observation	
Anesthesia		1	2	3	4	5	□Proper Position □Appropriate Choice □Technique □Needle Handling □Nerve Block □ Confirming Anesthesia	Direct Observation	
Time Out			Ye	es l	No		Completeness	Direct Observation	
Micrographic Surgery La	ayer(s)							Video	
	Removal	1	2	3	4	5	<ul> <li>Margin correlates with biologic behaviour          Debulk/ Curette         Bevel         Effective Technique         Depth         Orientation Marks         Tissue Handling         Relaxing Incisions     </li> </ul>		
	Orientation of Specimen	1	2	3	4	5	Gross Specimen Ink Specimen	-	
	Hemostasis	1	2	3	4	5	Appropriate Choice      Precision		
Histopathology		1	2	3	4	5	<ul> <li>□ Accurate Diagnosis □ Accurate Mapping</li> <li>□ Ability to troubleshoot suboptimal slide quality</li> <li>□ Appropriate request for deepers □ Staging</li> <li>□ High Risk Tumor Orders Placed for Necessary Referrals</li> </ul>	Direct Observation	
Reconstruction	1	1						Video	
	Review of Reconstructive Options	1	2	3	4	5	□ Convex/ Concave □ Location Specifics □ Use of Lax Skin □ Consideration for Co-Morbidities/ Risk Factors/ Lifestyle/Pt Preference □Photograph	_	
	Design	1	2	3	4	5	<ul> <li>Placement in Cosmetic Boundary Lines/ RSTL's          Measurements     </li> <li>Appropriate Length/width          Donor Site Selection          Respect for Free Margin     </li> </ul>		
	Incision	1	2	3	4	5	□ Instrument Selection □Use □ Blade Angle □ Efficiency □ Pressure		
	Undermining	1	2	3	4	5	Depth      Width      Tissue Handling      Instrument Use      Efficiency	-	
	Hemostasis	1	2	3	4	5	Appropriate Choice      Precision		
	Deep Sutures	1	2	3	4	5	□ Instrument Selection □ Suture Selection □Eversion □ Apposition □Correction of Step-offs □ Correct Number □ Correct Type □ Depth □ Close Dead Space □ Tissue Handling □ Needle Handling □ Knot Tying		
	Epidermal Closure and Dressing	1	2	3	4	5	□ Suture Selection □ Correct Type □ Eversion □ Apposition □Tissue Handling □ Optimal Tension □ Photograph □ Dressing Type □ Dressing application □ Suture Spacing		
Overall								Direct Observation	
	Safety	1	2	3	4	5	□ Use of PPE Appropriate Handling of Sharps □ Between Staff □ On Tray □ Handling of Suture Needle □ Organized Tray □Sterile Technique		
	Communication	1	2	3	4	5	□ W/ Staff during Surgery □W/ Staff Post-op Care □ W/ Patient during Surgery □ W/ Patient Post-op Care		
	Efficiency	1	2	3	4	5	Overall		
	Humanistic Qualities/ Professionalism	1	2	3	4	5	Compassionate Care      Courteous      Cultural Humility		
	Teamwork	1	2	3	4	5	<ul> <li>Respectful to Staff and Trainees          Patient-Centric Attitude     </li> <li>Effectively communicates with multi-disciplinary team</li> </ul>		

Comments:\_\_

Fellow Signature:

\_\_\_\_\_Evaluator Sig Evaluator Signature: \_\_\_\_

## 2. Basic Video Set-Up

Video systems range from simple to extremely complex. Any HIPAA compliant mobile device (i.e. iPhone, iPad) may be used to capture video. For a mobile device to be HIPAA compliant, a passcode must be required to access the device and the device cannot be connected to the cloud or backed up to an unprotected drive. At the simplest level, a staff member can hold the mobile device to capture the procedure on video. An alternative is to mount an iPhone camera to an overhead light which preserves image stabilization without the need for an assistant. The set-up does not obstruct the surgeon or the surgical assistants view or access to the operating field. The main disadvantage of this basic set-up is obstruction of the camera with the surgeon's or assistant's head. This can be mitigated by positioning the camera and light at an angle instead of directly overhead.

#### Equipment for Overhead Procedure Light Mount:

- 1. <u>Cr-30 SlimClip</u> \$17.95
- 2. <u>Calibration Weights</u> \$19.49
- 3. Microfiber Pouch \$7.95
- 4. <u>Silicone Tape</u> \$50.32 for a pack of six

See figure on next page for description of the set-up. A mobile device can be connected to an overhead procedure light through the CR-30 SlimClip. It locks in place with a smooth rotating screw and snug fitting claw mount. The SlimClip clamp attaches to any overhead procedure light handle from 1/8" to 1-1/2", and will hold any cellphone up to 3-7/8" wide. The procedure light is balanced on a fulcrum (C); thus, a counterweight for the camera must be placed on the opposing lever arm (D), just proximal to the built-in counterweight (F) of the procedure light. Small calibration weights ( Neewer, Guangdong, China) are used as counterweight. The calibration weights can be placed in a black 4x 8" microfiber pouch ( Black Squid, Australia). The draw –string of the bag is held in place against point D using Kind Removal Silicone tape (3M; St.Paul, MN).

To determine the approximate amount of weight needed to counterbalance the camera and mount, a basic physics principle, Archimedes law of the lever, is used. In reference to the Figure below, (distance BC) x (weight A)= (distance CD) x (weight E). This equation provides only an approximation of the weight required to maintain equilibrium. Other factors that may influence the weight required include built-in resistance of the surgical articulating arm and surgical lights without a built in counterbalancing weight. Once the appropriate weight has been determined, the camera can be easily set up in a few minutes for future procedures. Ho et al, Novel Camera Mounting Technique for Dermatologic Surgeries, *Derm Surg* 2017;1195-1197.

In section 7, advanced systems are described with suggestions for optimal equipment and assembly.





## 3. <u>Recommendations for Capturing Video:</u>

This section provides pearls for capturing high quality video using an Apple product/iPhone/iPad.

- 3.1 **Camera Placement**: The person setting up the equipment should coordinate with the surgeon to optimize camera placement and minimize obstruction of the camera view. The surgeon and assistant should be aware of placement of their hands and heads. In general, optimal camera position is directly perpendicular from the center of the wound. A 15-degree tilt away from the primary surgeon may offer less obstruction of the surgical field. Mounting the camera on the opposite bedside of the surgeon over the patient may give the best line of sight of the surgical field, rather than mounting the camera over the primary surgeon's shoulder. The sterile field should be kept free of any unnecessary debris such as bloody gauze, instruments not in use, or remainders of sutures. The surgeon, when feasible, could make an effort to display the procedure to the camera, displaying a flap in the elevated position and placing it in the intended location.
- 3.2 Landscape orientation: Always film with the camera held horizontally (landscape orientation).
- 3.3 **Reduce Excessive movement**: This can be corrected by mounting the camera to a fixed (C-stand) or semi-fixed (overhead light) structure.

3.4 **Optimizing Resolution**: Smartphone camera settings can be adjusted to record at the highest resolution available, but storage can be an issue with the large file size. By using a telephoto lens and reducing camera distance from the surgical field, you can avoid using the digital zoom function, which reduces quality for viewing on conference screens. Digital zoom operates by cropping the image which stretches a smaller number of pixels and results in lower resolution.

3.5 **Optimizing Exposure/Reducing Washout:** Since surgical lamps are extremely bright, the exposure (f-stop) settings must be adjusted to account for the surgical light. The use of fill lights can eliminate shadows and soften the harshness of a surgical light's brightness. By illuminating the sterile field from opposing directions, the light source is broadened, and the shadows are lessened.

Setting Exposure: For <u>iOS 13 or earlier</u>: While in the camera app, set appropriate exposure by tapping the screen to bring up the yellow focus box. Scroll the sun icon up or down to adjust exposure. Continue to hold your finger on the screen where you would like to focus until the "AE/AF Lock" (AE=Automatic Exposure, AF=Automatic Focus) yellow dialog box appears.

For iOS<u>**14.3 or later</u>**: while in the camera app, swipe up or tap the chevron to reveal hidden controls. Then tap the "+/- "button to access the ECV (Exposure Compensation Value) slider. Move slider to the right to make brighter, and to the left to make darker; the "AE/AF Lock" function will still work the same. This simply gives you control over exposure and focus separately.</u>

Make sure that all lights to be used during the procedure are on at time of adjustments.

3.6 **Correcting Color Imbalance/White Balance**: The automatic color correction or automatic white balance on most smartphones will impact video quality during recording. White-colored gauze and

gloves will enter and exit the camera frame and automatic color correction will create a variable final product. This will leave your videos looking orange (warm) or overly blue (cool) during different portions of the procedure. The best way to balance color is to use a manual setting in a movie capture app (such as MoviePro).

3.7 **Insufficient Battery Life**: Most dermatologic procedures will not drain a smartphone battery completely if recording for less than 1 hour. It is important to keep your device charged.

3.8 **Optimal Recording Times**: Limit recording times to 20 minutes maximum to limit file size of individual videos for processing/organization. Simply stopping the camera at a logical point and restarting it will accomplish this during longer procedures. Try to match incoming new video clip with the same movement or still scene as the outgoing video clip.

3.9 **Data Management Issues**: Many storage solutions will automatically degrade the highest quality video to make your video file a smaller size at the expense of the high-quality resolution at which you recorded. Take care to prevent file degradation at many steps throughout the capture, transfer, editing and rendering, and storage process. Each step may need to be manually corrected to keep the file quality at its most maximum quality.

#### 3.10 Advanced Video Capture with MoviePro Settings to Consider:

Mode: Video Resolution: If shooting in 1080p, your resolution should be 1920x 1080 at 30 frames per sec If shooting in 4k, your resolution should be 3840x2160 (16:9) at 30 frames per sec Video Encoding: HVEC Bitrate (level of data compression) should be a minimum of 150%. Higher rates are preferred but produce larger file sizes which require larger storage space. Audio>Audio Compression: Silent (No Audio) Video Stabilization: Cinematic Battery Saver: Off (if using a power cord) Orientation: Landscape Camera Preview: On

For a full tutorial please refer to: <u>https://www.youtube.com/watch?v=Ag2y-\_4Ndv4\_</u>A MoviePro App tutorial <u>https://www.youtube.com/watch?v=z4KF93IteyU\_</u>MoviePro Tutorial Version 7

For further reading, you can review Saun TJ, Zuo KJ, Grantcharov TP Video Technologies for Recording Open Surgery: A Systematic Review. Surg Innov. June 2019

## 4. <u>Recommendations for Editing Video for a Presentation:</u>

MoviePro App, iMovie, or Windows 10 Video Editor are some basic video editing platforms. Maximum speed should be 2x. When clipping a video, try to match movement or a still scene in the incoming clip with movement or a still scene in the outgoing clip.

## 5. <u>Recommendations for Storing Video</u>

Two separate secure HIPAA compliant locations are recommended for storage in case of data loss. Cloud based and external drive-based storage are two options.

#### **Network Storage**

Academic institutions may have already existing network storage drives available, and we recommend consulting with your IT department.

#### **Cloud Based Storage**

Medical practices must carefully examine the cloud vendor's specific provisions and policies before using a service for protected health information (PHI). Ultimately, the medical practice is the one responsible for complying with regulations.

Making sure the PHI is encrypted in the cloud is only the first basic step. Risk assessment and management is also critical. Prior to adopting any new cloud service, medical practices should conduct a comprehensive risk assessment and ensure policies, processes, and technology are in place to mitigate risks.

A cloud storage service becomes a business associate (BA) if they store PHI on behalf of a healthcare organization with whom they have a signed business associate agreement (BAA), and thus the service must be HIPAA-compliant. The law protects not only the privacy of the data but also its integrity and accessibility. HIPAA's Security Rule, which addresses electronic PHI, includes physical and technical safeguards such as audit controls and access controls, as well as administrative safeguards such as data backups and security incident procedures.

The following cloud storage services offer HIPAA support that include BAAs and encryption of data in transit and at rest:

- Your Institution's HIPAA- compliant cloud storage
- Dropbox Business: Dropbox Business offers a HIPAA Business Associate Agreement (BAA) for covered entities and can be configured to offer HIPAA-compliant cloud storage
- Google's G Suite Paid Version offers a **HIPAA** Business Associate Agreement (BAA) for covered entities and can be configured to offer **HIPAA-compliant cloud storage**
- Microsoft One Drive
- Carbonite

#### **External Drive- Based Storage**

For an external drive to be HIPAA compliant it must be password protected and employ encryption technology for the data while in transit and at rest. For further information on HIPAA rules for use of an external hard drive or access to EPHI on an external hard drive please refer to: https://www.hhs.gov/sites/default/files/ocr/privacy/hipaa/administrative/securityrule/remoteuse.pdf

1. You will need a computer to act as a go-between for the drive and device. The external drive listed above comes with a USB 3.0 interface, which should work directly with a Windows based laptop or desktop but may need a USB 3.0 to USBC adapter for Macs. If you are using a Mac, the drive will also need to be formatted for Mac. The instructions for doing this should be included or can be found here:

2. Be sure to name the drive something unique, and perhaps something that can be first in a series, as there is potential to need an additional drive later as your video library expands.

3.You can then use ImageCapture on Mac, the Windows Photo app, Explorer, or whichever app you would prefer to transfer your files to the new drive/destination folder.

4. Develop a naming convention for files that will help to keep things organized. These naming conventions will become extremely important as the size of your library grows. A good starting format might be: date/provider/procedure/diagnosis/anatomical location/patient name.

i.e.: 20201124-JLeitenberger-advancement flap – BCC- R nasal sidewall – McPatient, Joseph

#### 6. Recommendations for Patient Consent

If your patient consent already contains language for the use of videos and photographs for educational purposes, then it is likely unnecessary for additional explanation or consent for the use of video for fellow evaluation. If your patient consent lacks this language, the following paragraph may be considered but should be approved by the legal department of your institution.

#### CONSENT TO FURTHER USE OF VIDEOS AND PHOTOGRAPHS

I consent to the use of any videos and/or photographs taken as part of my treatment for purposes of medical education, lectures, publication in medical journals and textbooks; for in-office use as an educational tool with potential patients; for general marketing purposes, including but not limited to website, brochures, newsletters, social media and television media. I understand that no identifiable photograph of me will be published without my consent and furthermore I understand that I will not be identified by name. I understand that it is possible that someone may recognize me. By consenting, I understand that I will not receive payment or royalties from any party. This consent has a seventy-five (75) year expiration from the date signed and can be revoked at any time by notifying our office.

date signed and can be revoked at any time by notifying our office.						
PATIENT NAME: <u>«Pat Name»</u> DOB: <u>«Birth Dt»</u>						
PATIENT SIGNATURE:	DATE: <u>«Appt_Dt»</u>					
If you are not the patient, what is your relationship to him/her?						
WITNESS SIGNATURE:	DATE:					

## 7. Advanced Video Systems

Dr. Justin Leitenberger, Co- Director of Micrographic Surgery and Cutaneous Oncology at Oregon Health and Sciences University with the support of Arielle Gray, MD and Chris Garvey, WEMT MA presented a full review of published video methods at the Northwestern Dermatologic Surgery Symposium on August 24<sup>th</sup> 2019. They made a recommendation for advanced digital video set-up, recording, editing and storage based on their research and their findings are described in both the simple7.1 and advanced setups below.

#### 7.1 Simple C-Mount Stand Set-up

**Equipment**: The following is current for 2021, but the setup will evolve as technology improves.

- 1. Video Capture: iphone12 \$1099
- 2. Camera Lens: <u>Sandmarc Telephoto Lens</u> \$100 for iPhone 12 (models for earlier iPhone models available). By using the telephoto lens and reducing camera distance from the surgical field, you can avoid using the zoom function, which reduces quality for viewing on conference screens.
- 3. <u>C-Stand</u>: \$145
- 4. <u>iPhone camera mount</u>: \$30
- 5. <u>Fill light(s)</u>: \$44 each
- 6. Flex arm mount: \$20
- 7. <u>Video sand bag</u> (set of 4): \$23
- 8. External drive: \$907

### Simple C-Stand Setup:

A simple video setup involves a combination of this iphone camera mounting frame with the flex arm and the c-stand. With adherence to settings guidelines, this system can capture quality video.



#### C-Stand Assembly ('silver stand') Quick Guide:



The most inferior two legs of the stand swing into place and will lock automatically when extended completely; the most superior (and longest) third leg (indicated by green dot) locks into place manually with the T-Handle (yellow arrow)

Note that the attachment grip head with **two** T-Handles should connect the rigid grip arm to the c-stand (see two red arrows highlighting these two T-Handles)

The attachment grip head with **one** T-Handle (pink arrow) should be distal to the stand and serves as the point of attachment for the flexible grip arm ('black bendy arm') and subsequently the camera mount.

#### 7.2 Advanced C-Stand Mount Set-up

The advanced setup includes items 1-8 from the basic set-up as well as three additional items.

- 1. Video Capture: <u>iphone12</u> \$1099
- 2. Camera Lens: <u>Sandmarc Telephoto Lens</u> \$100 for iPhone 12 (models for earlier iPhone models available). By using the telephoto lens and reducing camera distance from the surgical field, you can avoid using the zoom function, which reduces quality for viewing on conference screens.
- 3. <u>C-Stand</u>: \$145
- 4. <u>iPhone camera mount</u>: \$30
- 5. Fill light(s): \$44 each
- 6. Flex arm mount: \$20
- 7. Video sand bag (set of 4): \$23
- 8. External drive: \$907
- 9. Super Clamp w/Grip Head: \$49
- 10. Grip Head w/20" arm: \$36
- 11. Manfrotto Boom Arm: \$21

#### **Advanced Camera Mount**

Camera mounting frame with fill lights attached. This frame has multiple attachment points and comes standard with 2 additional mounting screws. There is also a "cold shoe" mounting attachment in the top center of the frame. The frame is mounted on a flexible grip arm that can be inserted into one of the grips.





<u>Red:</u> camera mount (metal) for phone or similar device with fill lights mounted at opposing angles.

<u>Pink</u>: 6-foot power cords for fill lights and for camera device for longer duration procedures. These are attached to the boom arm, and run from power supply to lights. This removes dependence on batteries and can prevent catastrophic data loss.

<u>Green:</u> Grip heads (2.5 inch) with T-Handles for adjustment of the boom arm height and angle.

Orange: Super clamp and grip head (2.5 inch) to stabilize base of 40 inch boom arm.

Yellow: Multi-outlet power source to power both fill lights, and a charger for camera device. This is connected to c-stand and must be plugged in to an AC outlet and accommodations should be made to prevent personnel from tripping over cord.

<u>Blue:</u> T-Handles that control both height and rotation of stand. Maximum height of 10.5 feet, minimum height of 4.5 feet.

<u>Teal:</u> Sandbags act as a counter weight for the reach of the boom arm. This greatly reduces the danger of camera rig falling into sterile field. Sandbags are 20lbs. each and should be placed on the shorter two legs of the c-stand. The longer leg should be placed towards the boom arm for maximum stability.