



IC36-R: How to Economically Produce High Quality Videos

Moderator(s): James R Mullen, MD

Faculty: Randip R. Bindra, FRACS, MCh Orth, Warren C. Hammert, MD, and David V. Tuckman, MD

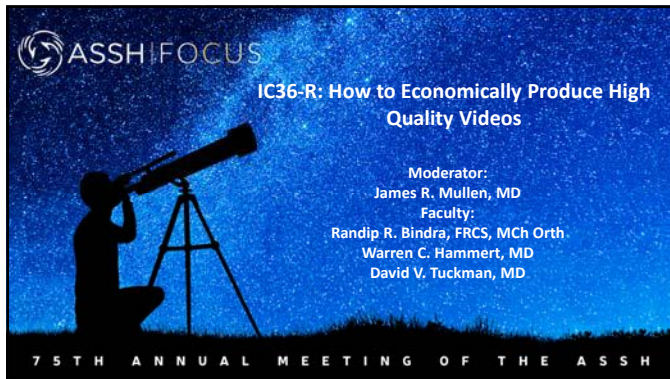
Session Handouts

75TH VIRTUAL ANNUAL MEETING OF THE ASSH
OCTOBER 1-3, 2020

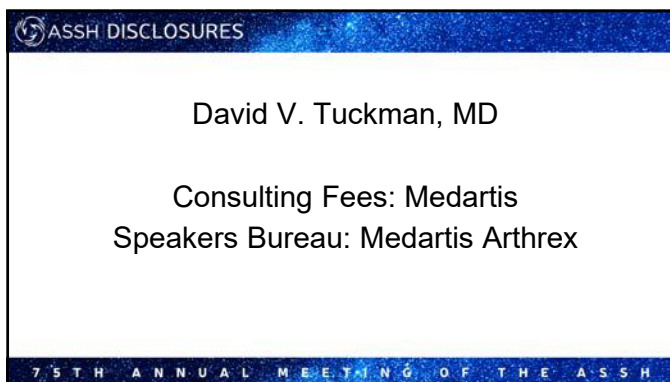


822 West Washington Blvd
Chicago, IL 60607
Phone: (312) 880-1900
Web: www.assh.org
Email: meetings@assh.org

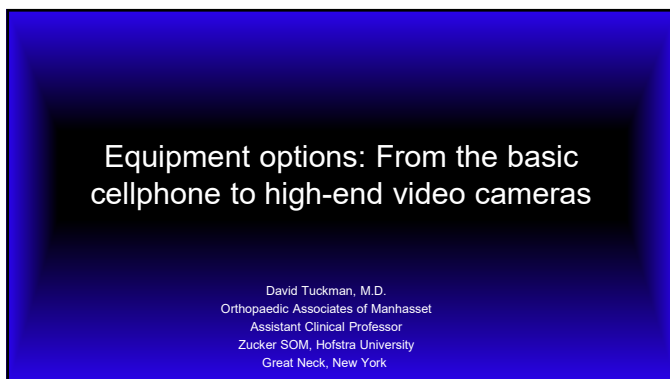
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Videos

<ul style="list-style-type: none"> Proximal Row Carpectomy with a Capsular Interposition Radiocarpal Dislocation Open Reduction and Bridge Plating Olecranon Fracture ORIF - Double Plates Arthroscopic Foveal TFCC Repair Dorsal Wrist Ganglion Cyst Excision - Three Varieties Basal Joint Stabilization Distal Radius Malunion - Volar Opening Wedge Osteotomy Submuscular Ulnar Nerve Transposition Jersey Finger Repair Augmented with the Volar Plate Scaphoid Nonunion ORIF and Distal Radius Bone Grafting 12 Minute Distal Radius Fracture ORIF Glomus Tumor Excision Proximal Phalanx Nonunion ORIF Proximal Phalanx Fracture ORIF Through a Volar Approach Scaphoid Excision and Partial Wrist (Capitolunate Fusion) Proximal Row Carpectomy Ulnar Translocation of the Wrist - Open Reduction and Bridge Plating MP Joint Collateral Ligament Reconstruction Augmented with an Internal Brace PIP Joint Dorsal Fracture Dislocation ORIF Through a Volar Approach Volar Carpal Translation Maneuver Using the Medartis Distal Radius Plate 4th and 5th carpometacarpal joint dislocation fixation using an internal brace 	<ul style="list-style-type: none"> Bony Jersey Finger ORIF (Type III) with a Plate and Screws Dorsal Approach and Plating of a Proximal 1/3rd Radius Fracture Distal Radius Impending Malunion ORIF with a Dorsal Periosteal Release Lateral Approach and Plating of a Proximal Phalanx Fracture PIP Joint Hemihamate Reconstruction Elbow Lateral Ulnar Collateral Ligament Repair Augmented with an Internal Brace Thumb Ulnar Collateral Ligament Reconstruction Augmented with an Internal Brace Thumb Ulnar Collateral Ligament Repair with Internal Brace Augmentation Bony Gamekeeper's ORIF Bennett's Fracture ORIF Through a Wagner Approach Radial Head/Neck Fracture ORIF Coronoid Anteromedial Facet Fracture ORIF Nerve Blocks of the Wrist and Hand Basal Joint Arthroplasty with Internal Brace Dorsal Approach and Plating of a Distal Radius Fracture Single Incision Distal Biceps Repair Using the Modified Tension Slide Suture Technique Open Reduction of an Irreducible MCP Dislocation Radial Collateral Ligament Repair of the Thumb MP Joint with an Internal Brace Axial Flexor Tendon Repair Using a Cross Locked Cruciate Core Suture PIP Joint Volar Fracture Dislocation ORIF with a Dorsal Plate
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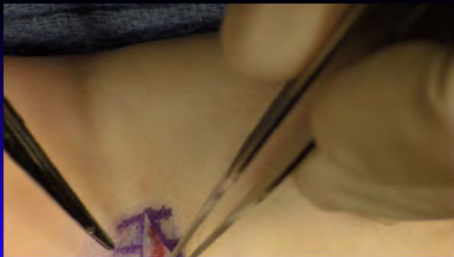
Digital vs Optical Zoom

- Digital zoom
 - Enlarges the image, sacrifices resolution
- Optical Zoom
 - Uses lenses to enlarge the image while still maintaining the same resolution

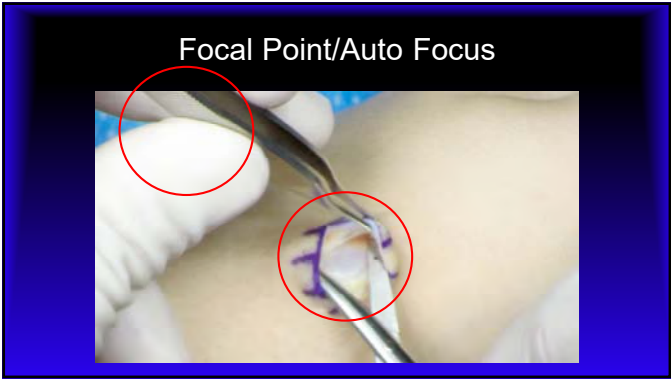


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Balance between zoom vs missing the shot



6

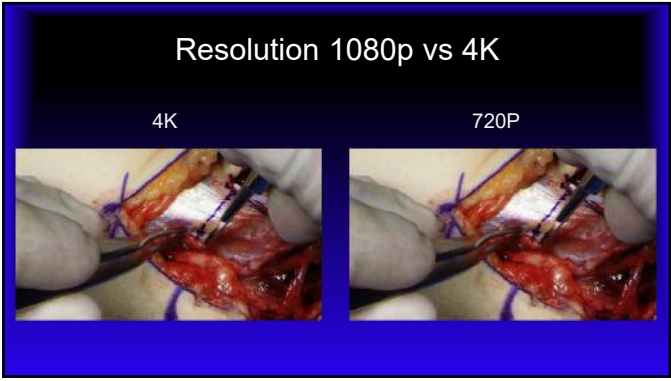


7

Resolution 1080p vs 4K

- Always shoot in 4K
 - Large files
 - 4 GB for 12 min
 - Check camera memory
 - Digital zoom
 - Uses more battery on the camera
 - More processing power
 - Stunning images

8



9

Cell Phone

- iPhone 7 or newer
- 4K video 30 FPS
- Battery – Excellent
- Memory
- Not POV
- No built in optical zoom
- Stable platform



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[illegible]

Cell Phone - Exposure



11

[illegible]

Cell Phone - Exposure



12

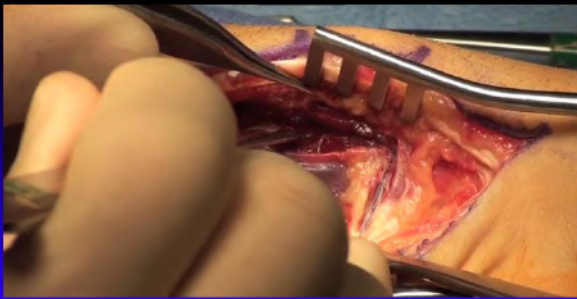
Cell Phone - Zoom

500% Digital Zoom



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POV – Point of View



14

GoPro

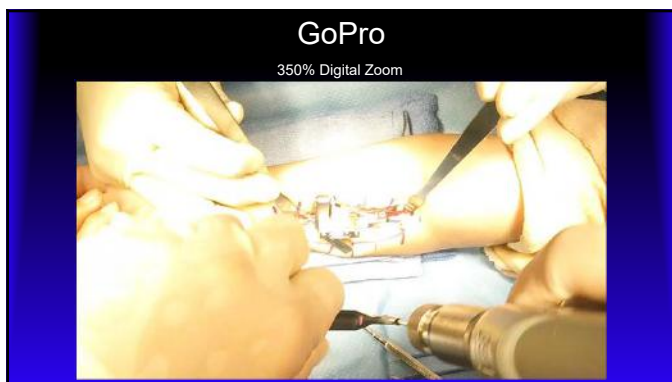
- 4K video
- Internal battery – 50 min
- External battery – 9 hours
– USB to USB C cable
- Optical Zoom
- Head Mount



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SWIS Surgical Video

- GoPro
 - Remote lens
 - Optical Zoom
 - Remote battery



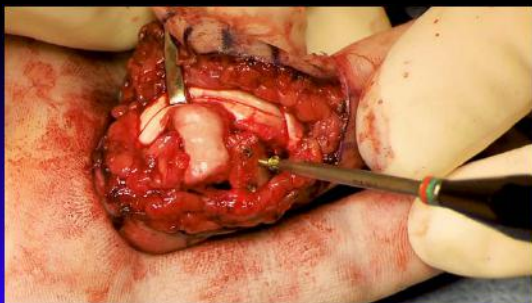
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SWIS Surgical Video



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SWIS Surgical Video



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HOW TO EDIT A VIDEO CLIP WITHIN POWERPOINT

Randy Bindra MD FRACS

Gold Coast, Australia

In order to embed and edit a video within PowerPoint you need Office 365 or PowerPoint 2016. The process involves importing a video that is then embedded into the file (the default behavior). Previous versions only created a or link to the video with the caveat that you need to store the video file into the same flash drive if you are to make a presentation on another computer.

- Inserting an embedded video is convenient, but it increases the size of your presentation.
- A linked video keeps your presentation file smaller, but links can break. We recommend storing presentations and linked videos in the same folder.
- Embedding the video allows you to edit it like a photo- you can crop, trim and compress.
- Like any animation, you can set it to start automatically or when clicked.

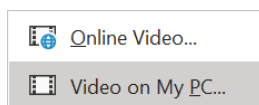
Supported video formats

In PowerPoint 2016 and newer versions, Microsoft recommend that you use .mp4 files encoded with H.264 video (a.k.a. MPEG-4 AVC) and AAC audio. Avoid 4K and higher resolutions as the file is too large and the presentation will likely stall.

Newer android and Apple phones use High Efficiency Video Codec, or HEVC by default, while it offers higher quality at lower bit rates than H. 264, it is not compatible with PowerPoint. In camera options, please do NOT select the HEVC format.

Embed a video stored on your PC

1. In Normal view, click the slide that you want the video to be in.
2. On the Insert tab, click the arrow under Video, and then click Video on My PC.
3. In the Insert Video box, click the video that you want, and then click Insert.

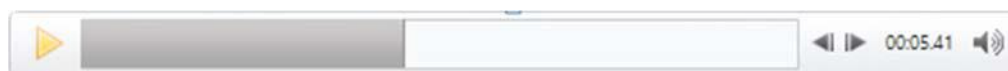


Ensure compatibility with PowerPoint

After you have added the video, on the menu bar go to File > Info. If the file is in an unsupported format, select the option, Optimize Media Compatibility and PowerPoint will re-encode the video into .mp4 format. This can take several minutes and not all files can be converted-if you get an error message, you will have to use an alternative video encoding software to re-encode and insert into PP.

Preview a video

When a video is selected on a slide, a toolbar appears below the video that has a play/pause button, a progress bar, incremental forward/backward buttons, a timer, and a volume control. Click the Play button at the left of that toolbar to preview the video.

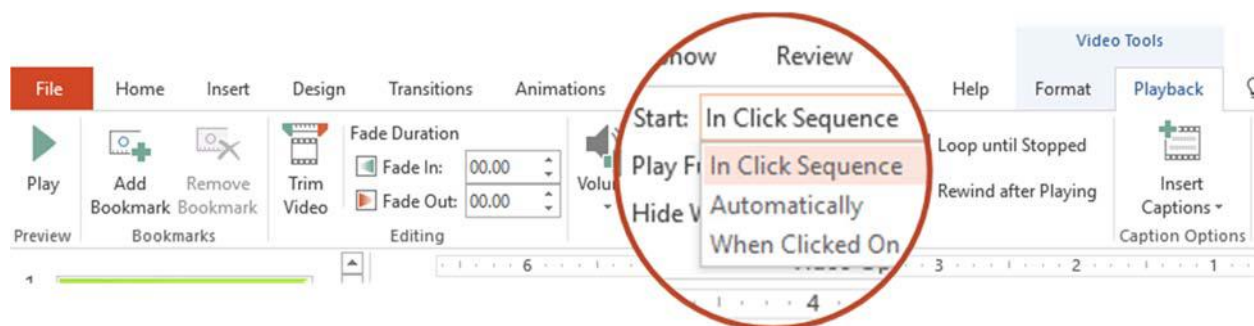


Play a video automatically or when clicked

By default, in Slide Show, the video plays as part of the click sequence. That means that when you click anywhere on the slide to advance to the next step (or when you press the Spacebar, Right arrow key, or other key that advances to the next step) the video plays. This Start option is called In Click Sequence.

But if you prefer, you can make the video start automatically as soon as it appears onscreen, or make it play when it is clicked:

1. Select the video frame.
2. On the ribbon, on the Video Tools Playback tab, open the Start list and choose the option you prefer:



Option	Description
In Click Sequence	This is the default behavior, as described above. When you click anywhere on the slide to advance to the next step, the video plays.

Option	Description
Automatically	The video starts automatically. (If there are animation steps before it, the animation steps will play first and then the video starts playing automatically. If there are no other animation steps before the video on the slide, the video begins playing immediately.)
When Clicked On	The video starts only when it has been clicked.

It is best to select “play automatically” – this will help avoid the podium fumble for a mouse to click.

There are 2 menu items you can change with a video after it has been inserted into the slide. Click on the video to highlight it and the 2 menu options will appear: Video Format and Playback.

With **Video Format** you can manipulate the video as you would a picture, you can brighten it, rotate it and the best thing, crop it so effectively you are zooming in on the most important part of the surgery you wish the viewer to focus on.



With the Playback menu option, you can add bookmarks at critical parts of a long video to help you jump to various steps of the procedure. You can trim the video, mute the volume, set the playback start to automatic or when clicked, let the video run as a loop.



The most useful option is the trim video where you can remove unwanted parts of the video and trim it down to the few minutes of a critical step.



This is perhaps the most important feature and saves the effort of importing the clips into a video editing software and then reinserting into powerpoint.

You can insert the same video clip into multiple slides, and show different parts of the procedure by trimming the video (and cropping where needed) to tell the entire story as a set of slides with every step of the procedure shown as a separate clip.

Once you are done improving, cropping, muting and trimming the video you have a relatively large file size with the embedded videos. A hidden gem here is the media compression tool found under File-Info.

When you click on compress video, you can choose media quality you desire- 720p HD is good enough for most presentations and will generally compress a video to less than a quarter its size.

The screenshot shows the PowerPoint 'Info' pane on the right and the 'Compress Media' dialog box in the foreground. The 'Info' pane is titled 'Bindra_ trapeziectomy 2020 - FINAL (1)' and shows a 'Media Size and Performance' section. The 'Compress Media' dialog box displays a table of media files and their compression status.

Info Pane:

- Title:** Bindra_ trapeziectomy 2020 - FINAL (1)
- Downloads:** Upload, Share, Copy path, Open file location
- Media Size and Performance:**
 - Save disk space and improve playback performance by compressing your media files. Compression might affect media quality. Embedded subtitles and alternate audio tracks will be removed.
 - Media files in this presentation are 5,972 MB.
 - [More ways to improve media performance](#)
- Compression Options:**
 - Full HD (1080p):** Save space while maintaining overall audio and video quality.
 - HD (720p):** Quality will be comparable to media which is streamed over the Internet.
 - Standard (480p):** Use when space is limited, such as when sending presentations via e-mail.
 - Undo:** You can undo the previous compression.

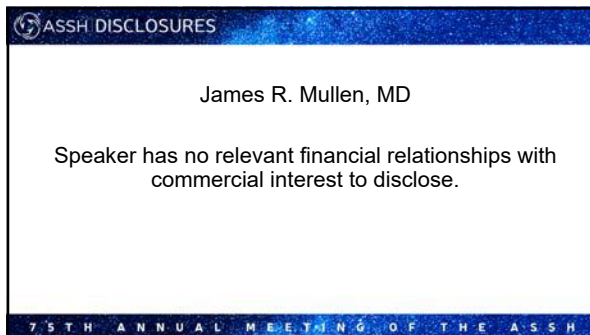
Compress Media Dialog Box:

Slide	Name	Initial Size (MB)	Status
1	nugrip uncut	5,776.5	Complete - 4,246 MB Saved
27	trapeziectomy.movie	45.5	Already Compressed
45	Eaton CMC stabilisation	94.6	Complete - 0 MB Saved
46	Eaton CMC stabilisation	55.3	Already Compressed

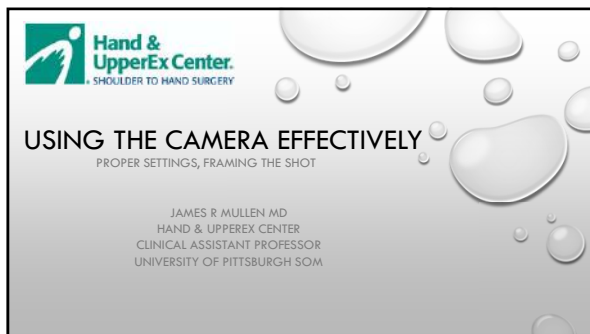
Compression complete. You saved 4,246 MB.

Close

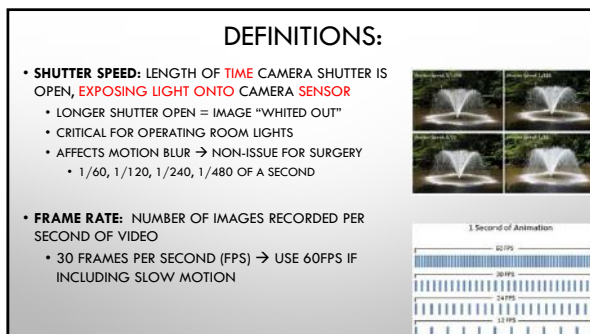
That's it, you now have a complete singing and dancing presentation with cropped and trimmed videos that have been compressed for lag-free playback.



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DEFINITIONS:

- **IDEAL VIDEO SHUTTER SPEED:** APPROXIMATELY **DOUBLE THE FRAME RATE**
 - IF RECORDING AT 30 FPS → **SHUTTER SPEED** SHOULD BE 1/60TH OF A SECOND.
- **NEUTRAL DENSITY (ND) FILTERS:** SHOOTING IN BRIGHT LIGHT WITHOUT OVEREXPOSING IMAGE
 - **SUNGLASSES** FOR YOUR CAMERA

4

THE CAMERA SETUP



- GOPRO HERO 6 OR NEWER → **\$200-350**
 - **DIGITAL ZOOM** CAPABILITY
- EXTERNAL USB BATTERY PACK → **\$15**
- FANNY PACK → **\$15**
- 6FT USB POWER CORD → **\$7**
- GOPRO ELASTIC HEADBAND → **\$8**
- SET OF NEUTRAL DENSITY FILTERS → **\$35**
 - USE ND16, **ND32**, ND64
- 128GB OR 256GB "UHS CLASS 3" SPEED MEMORY CARD → **\$20**
- **TOTAL COST** → **\$300 - \$450**



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LED VS "REGULAR" OR LIGHTS

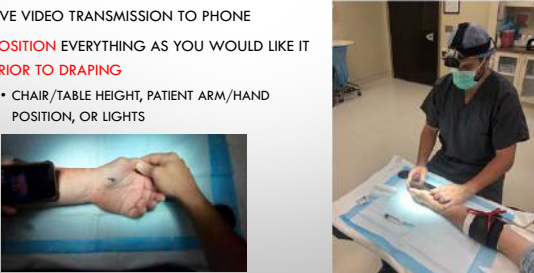
- **LED LIGHTING:**
 - BRIGHTER → OVEREXPOSED
 - **"FLICKER"** AT 50-60HZ → CAN BE NOTICEABLE TO NAKED EYE
 - SOMETIMES EVEN MORE SO ON VIDEO DEPENDING ON CAMERA SETTINGS
 - SHUTTER SPEED NEAR 1/60 IDEAL → FASTER SHUTTER = FLICKERING
 - REDUCING INTENSITY OF LIGHT SOURCE CAN MAKE FLICKERING MORE APPARENT
- **GENERAL RULE:** **DEFOCUS LIGHTS** ONTO ENTIRE OPERATIVE FIELD AS OPPOSED TO JUST THE INCISION → LESS VARIATION IN LIGHTING INTENSITY


6

FRAME SHOT PRIOR TO DRAPING!

- LIVE VIDEO TRANSMISSION TO PHONE
- **POSITION** EVERYTHING AS YOU WOULD LIKE IT **PRIOR TO DRAPING**
 - CHAIR/TABLE HEIGHT, PATIENT ARM/HAND POSITION, OR LIGHTS



7

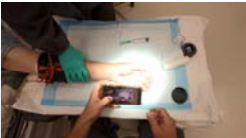
GOPRO SETTINGS:

- PROTUNE → ON
- FRAME RATE → 30 FPS
- FIELD OF VIEW → LINEAR
- RESOLUTION → 2.7K (DIGITAL ZOOM NOT AVAILABLE AT 4K)
- ISO → MIN 100, MAX 1600
- WHITEBALANCE → AUTO
- SHARPNESS → HIGH
- COLOR → GOPRO
- **SHUTTER** → 1/60 TO 1/480 DEPENDING ON LIGHTING AND ND FILTER USED (ND16 VS **ND32** VS ND64)




8


- No ND filter, No zoom, Shutter 1/240




- ND16 filter, Max zoom, Shutter 1/240



- ND16 filter, Max zoom, Shutter 1/480





9

MAXIMIZING PICTURE QUALITY

- AVOID WHITE BACKGROUND MATERIAL
- USE DARK COLORED GLOVES
- REMOVE LAPS/RAYTECS FROM FIELD
- DRY FIELD REDUCES GLARE
- DEFOCUS LIGHTS → LESS GLARE/OVER EXPOSURE
- DECREASE LIGHT INTENSITY (BEWARE OF FLICKERING)
- **MAJOR LIMITATION WITH GOPRO:**
 - MAX ZOOM IS NOT ZOOMED IN ENOUGH
 - WHY OVEREXPOSURE/GLARE IS SUCH AN ISSUE
 - NOT AN OPTICAL ZOOM → LOOSE PICTURE QUALITY

10

An Efficient Work Flow for Video Editing and Voice Over

David Tuckman, M.D.
Orthopaedic Associates of Manhasset
Assistant Clinical Professor
Zucker SOM, Hofstra University
Great Neck, New York

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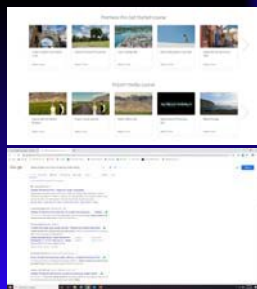
Not HIPAA Compliant

- Tattoo
- Anatomic anomalies
- Birthmarks
- Scars

2

App - Windows



- Windows Video Editor – photos
 - Under powered
- Adobe Premiere Pro
 - \$20 month
 - Professional video editing program
 - Great tutorials
 - Large online community
 - Google
 - YouTube



3

Computer





- Desktop
 - 4K video
 - i7 multicore processor
 - 32Gb RAM
 - Graphics card
 - Hard drive
 - 1TB SSD – operating system
 - 4TB disk drive – storage

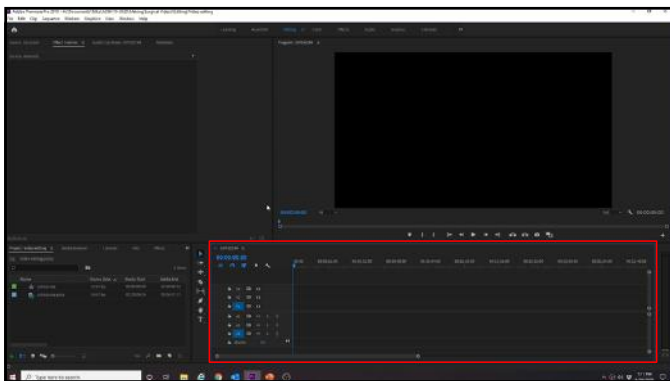
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Computer

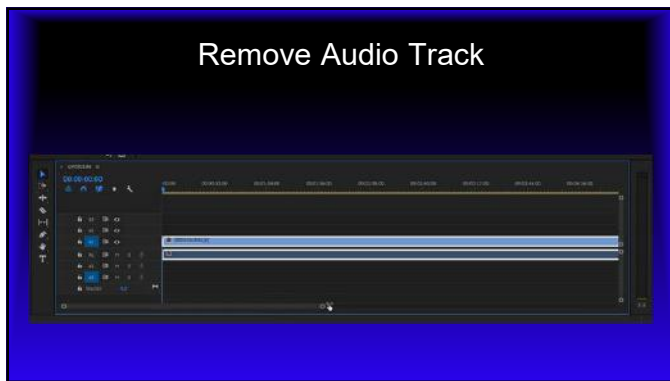
- Backup
- Backup
- Backup
- Backup
 - Local
 - Offsite
- CrashPlan
 - \$10 a month
 - Unlimited storage

5



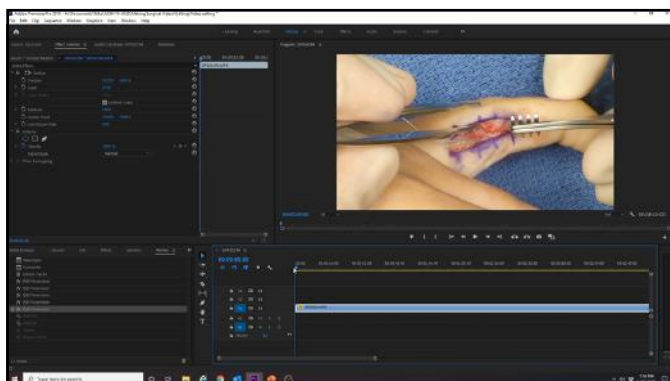
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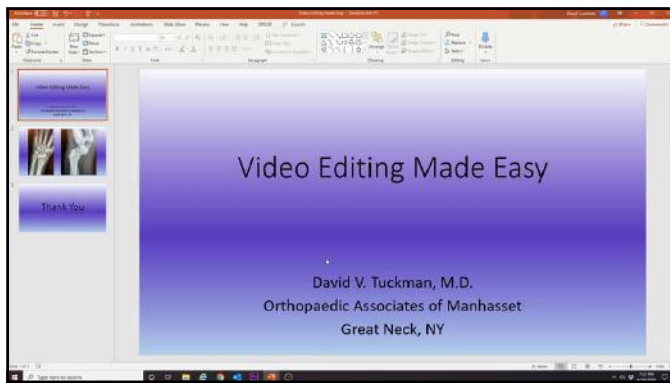
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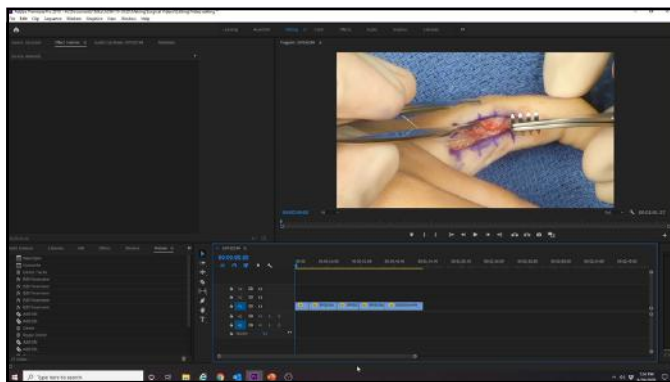
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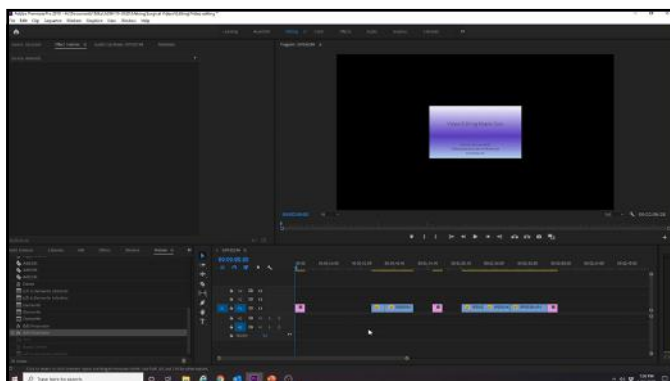
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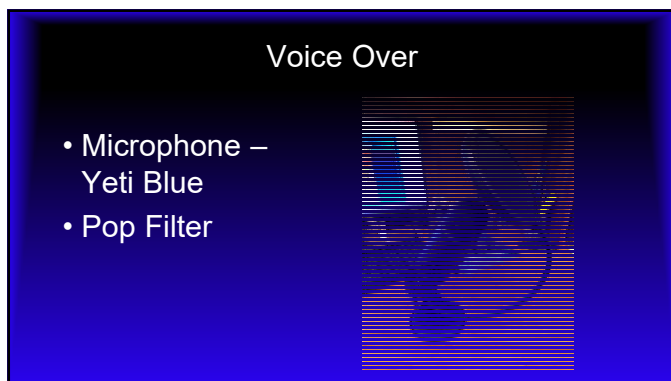
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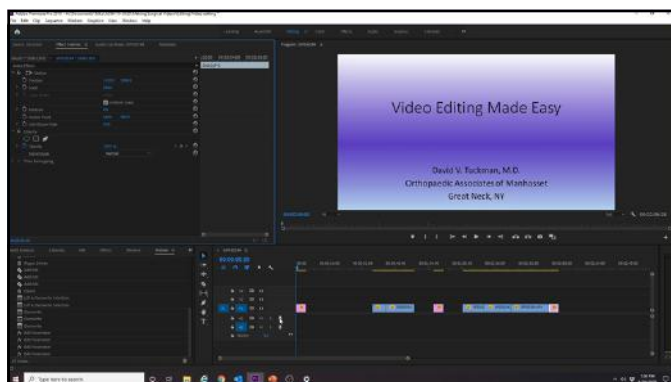
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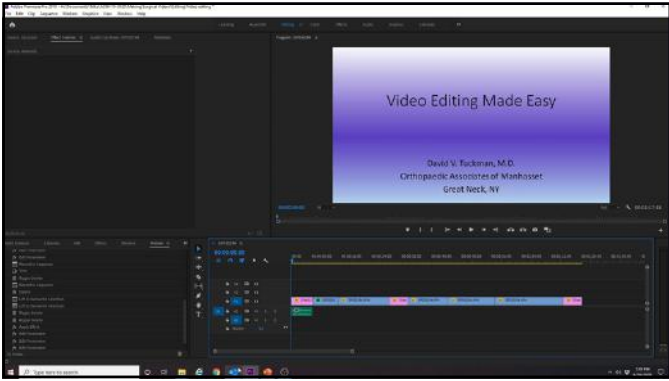
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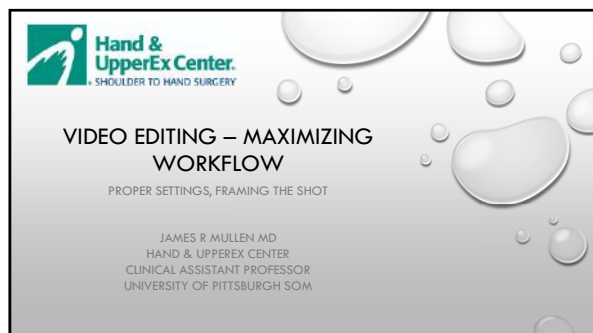
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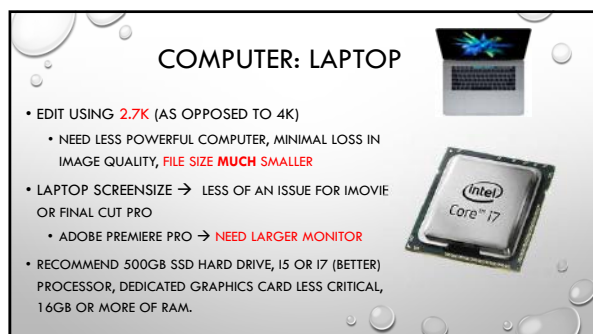
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EDITING VIDEO: IMOVIE DEMO

⌘+B → MOST IMPORTANT command to use/memorize!

- Splits one clip into two clips



- Crop "down"/decrease size of frame to include only incision
- Zoom in as much as possible in post-production




*Patient consent obtained for media use (tattoo)

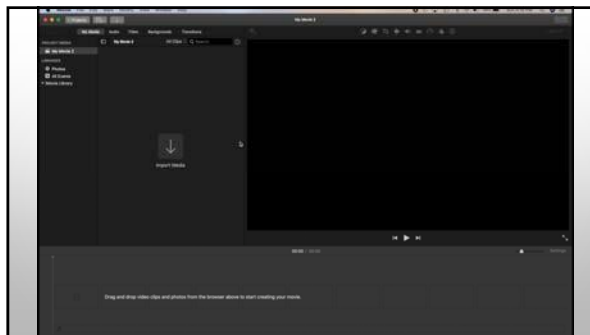
4

VOICE OVER:

- MAKE SURE VIDEO EDITING IS COMPLETELY FINISHED FIRST
- I USE "STANDARD" APPLE HEADPHONES → GOOD QUALITY MICROPHONE
- WATCH THE ENTIRE VIDEO A FEW TIMES BEFORE RECORDING
- RECORD VIDEO IN 1 TAKE** → MORE EFFICIENT, CAN EDIT AUDIO CLIPS IN SAME MANNER AS VIDEO CLIPS IN ORDER TO CREATE BETTER TIMING AND ELIMINATE PAUSES/UNNECESSARY WORDS
 - RE-RECORD PARTS AS NEEDED



5



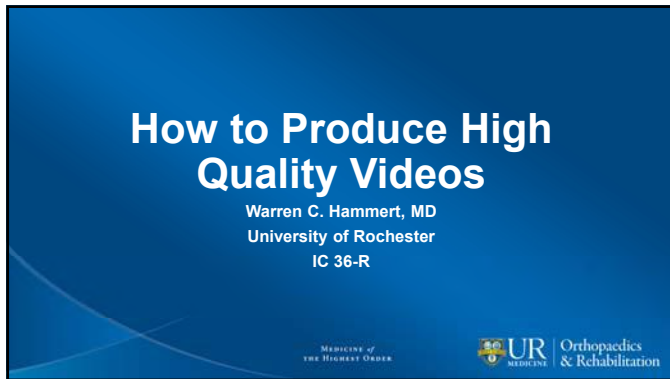
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FINAL TIPS:

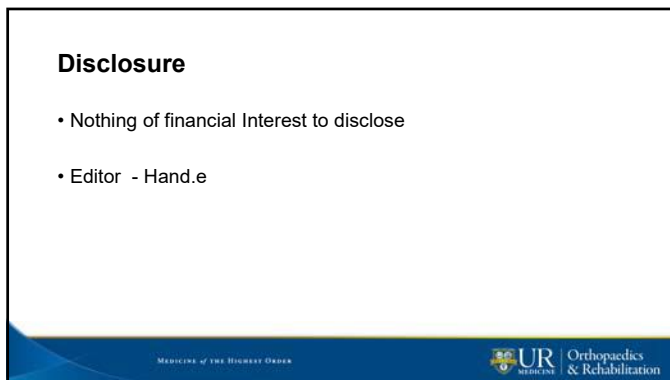
• NOT A HIGHLIGHT FILM

• STEPS AND TECHNIQUES THAT WERE NOT EFFECTIVE → JUST AS HELPFUL AS THOSE WHICH WORKED WELL

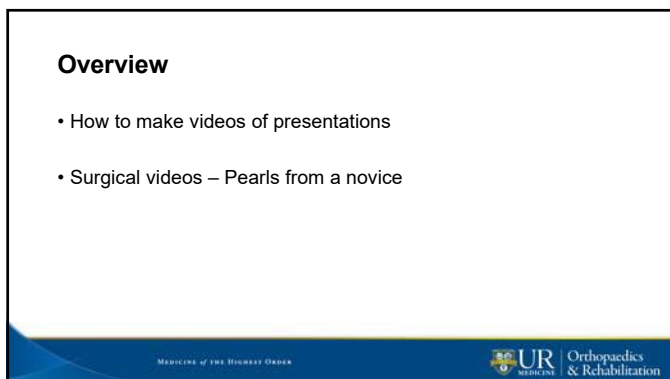
• CRITICAL TO CROP DOWN THE ORIGINAL IMAGE → OPERATIVE FIELD ENCOMPASSES ENTIRE VIEWING SCREEN



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How to make a video from a power point presentation

- Slide show
- Record slide show
 - This will create an audio file for each slide
- Say yes to save times upon completion
- File
- Export
- MP4

MEDICINE of THE HIGHEST ORDER



4

Surgical Video Pearls from a Novice

- **Equipment**
- Phone camera
- Go Pro
- Overhead (in the OR light camera)

MEDICINE of THE HIGHEST ORDER



5

Video Editing

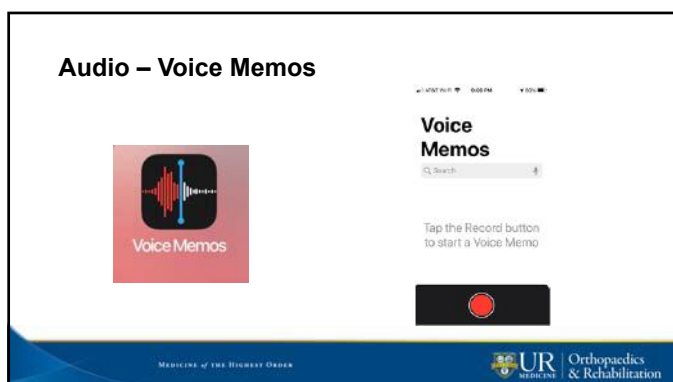
- iMovie

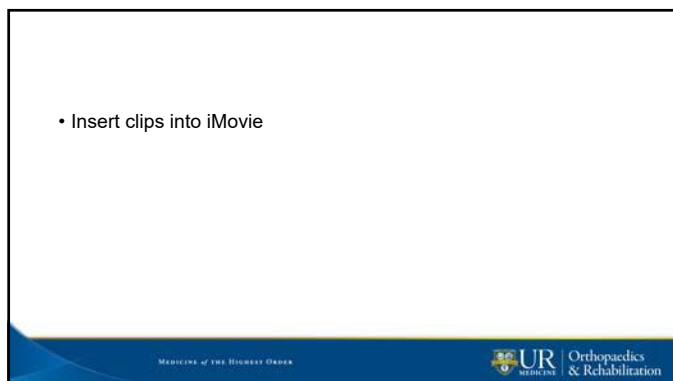
- Voice memos

MEDICINE of THE HIGHEST ORDER



6







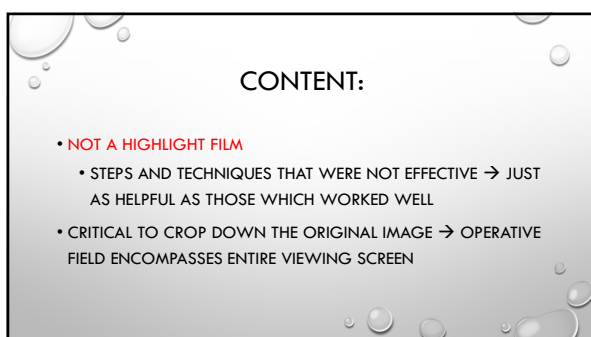
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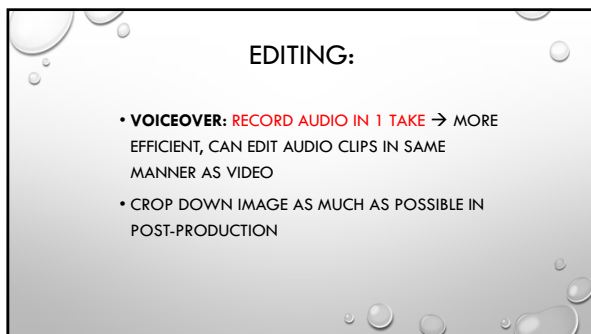
11



1



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CAMERA SETTINGS:

- FRAME RATE → 30 FPS
- FIELD OF VIEW → LINEAR
- RESOLUTION → 2.7K OR 4K
- PROTUNE → ON
 - ISO → MIN 100, MAX 1600
 - SHUTTER → 1/60 TO 1/480
DEPENDENT ON LIGHTING AND ND
FILTER USED (ND16 VS **ND32** VS ND64)
- **DECREASE GLARE**
 - AVOID "WHITE" IN BACKGROUND
 - DARK COLORED GLOVES
 - DRY FIELD
 - DEFOCUS LIGHTS
- **LIMITATION WITH GOPRO:**
 - MAX ZOOM IS NOT ZOOMED IN ENOUGH → **DIGITAL < OPTICAL**
 - OVEREXPOSURE, GLARE, PIXELATED IMAGE

4

FRAME SHOT PRIOR TO DRAPING!

- LIVE VIDEO TRANSMISSION TO PHONE
- POSITION EVERYTHING AS YOU WOULD LIKE IT PRIOR TO DRAPING
- **NO SUBSTITUTE FOR OPTICAL ZOOM → BEST IMAGE QUALITY BY FAR (SWIS SYSTEM)**
 - EASIER TO MISS OPERATIVE FIELD, HARDER TO MAINTAIN IMAGE IN FOCUS, MORE EXPENSIVE
- DIGITAL ZOOM (**GOPRO**): EASIER TO KEEP IMAGE IN FOCUS, LESS LIKELY TO MISS SHOT...**BUT** LOWER/PIXELATED IMAGE QUALITY, LESS EXPENSIVE



5

FINAL THOUGHTS FROM THE PANEL



Questions: James.Richard.Mullen@gmail.com

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