



# **CPT for Diagnostic Physicists What It Is and How to Implement**

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## Medical Coding and Billing

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### Codes

- Help facilitate uniform information between physicians, patients, accreditation organizations and payers.
- Three primary code sets are in use in the US for submitting medical claims to an insurer
- Healthcare Common Procedure Coding System
  - HCPCS Level 1 – what the provider *did*
    - *Physician and staff work, equipment and supplies*
    - *CPT Codes – Current Procedure Terminology*
  - HCPCS Level 2 codes – what the provider *used*
    - *Non physician services, supplies, procedures not described by Level 1 codes*
- ICD-10-CM codes – why the provider did and used that
  - *Diagnosis and/or circumstances*

# Current Procedural Terminology

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## CPT Codes

- Codes within the Healthcare Common Procedure Coding System (HCPCS) that describe medical, surgical, and diagnostic services
- Code set created and maintained by the American Medical Association through their CPT Editorial Panel
- First published in 1966 and now the standard codes used by CMS and most private insurers in the US
- Code set revised annually

# Resource-Based Relative Value Scale

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## How Physicians and Their Practices Get Paid

- Methodology used by CMS & other insurers to determine physician payment for each CPT code
- Relative Value Units (RVUs) – defines the value of a service or procedure on a common scale relative to all services/procedures
- Total RVU for a CPT code is the sum of:
  - Work RVU - Physician time for procedure
  - Practice Expense (PE) RVU - Supplies, equipment, and nonphysician staff utilized
  - Malpractice (MP) RVU - Cost of professional liability/malpractice insurance
- For CMS, payment set by equation\*:  $\sum RVUs * \textit{Conversion Factor (CF)} = \$\$$ 
  - CF currently \$34.8931/RVU
  - Some codes reimburse differently based on location of service
- RVU assignments for each code reviewed at least every 5 years to adjust
  - AMA Specialty Society Relative Value Scale Update Committee (RUC)



## How Physicians and Their Practices Get Paid

### CMS example

CPT Code	Exam	Work RVU	Practice Expense	Malpractice	Total RVU	Payment
74018	X-ray abdomen 1 view	0.18	0.67	0.02	0.87	\$ 30.36
74150	CT abdomen w/o contrast	1.19	3.05	0.06	4.3	\$150.04

- Work RVU for CT is ~ 10x that of a single view X-ray
- PE is also higher, due to higher equipment costs
- Overall CMS reimbursement for CT is higher than 1 view X-ray
- Most radiology services can be broken out into “Professional” and “Technical” components

CPT Code	Exam	Work RVU	Practice Expense	Malpractice	Total RVU	Payment
74150	CT abdomen w/o contrast - Total	1.19	3.05	0.06	4.3	\$150.04
74150	Professional Only	1.19	0.43	0.05	1.67	\$ 58.27
74150	Technical Only	0	2.62	0.01	2.63	\$ 91.77

## CPT Codes & Medical Physics

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- Several CPT codes related to TX physics services, for example:
  - Continuing medical physics consult (77336): Assessment of treatment parameters, review of patient treatment documentation, & QA of dose delivery
  - Special medical radiation physics consult (77370): For special situations that might arise (brachy therapy, stereotactic radiosurgery, etc.)
  - Special dosimetry (77331): using TLDs, diodes, film, etc. for independent measure of dose
- CPT codes are required to be patient specific, and DX physics work in large part isn't
- Our services haven't been directly billable

**UNTIL NOW**

## CPT 76145

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- As of January 1, 2021, CPT code # 76145 for “Medical physics dose evaluation for radiation exposure that exceeds institutional review threshold, including report”
- Intended for peak skin/organ dose calculations from fluoroscopically guided interventional (FGI) procedures
- Code is intended to reimburse for the significant time that can be spent doing peak skin dose calculations
- Standalone code – Not bundled to a particular FGI procedure
  - Practice expense (PE) only
  - No physician work RVU component

## CPT 76145 – Brief History

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- First efforts in 2011, but didn't gain traction
  - Work done by Jerry White
  - AMA stopped issuing technical only codes for a time
- ACR championed recent effort beginning in 2018
- AAPM doesn't have a seat on AMA RUC panel, but ACR does
- AAPM involvement via Mahesh as the ACR's commission chair for physics
- Backing of Society of Interventional Radiologists (SIR) and American College of Cardiology (ACC)



Finally, a diagnostic CPT code



# So Many Questions...

## CPT 76145


- When do we use it?
- What threshold should I use?
- Who orders it?
- How can I do the PSD estimate?
- What if I have fancy peak skin dose software?
- What's the expected detail level of the report?
- Who can prepare/sign the report?
- How much does CMS value my worth?
- How do I set it up?




## Where To get Info?



- CPT codes and associated info are copywritten by the AMA
- Most materials that were presented to the AMA/RUC in the creation of the code are considered confidential and are not publicly available
- 76145 is discussed in AMA's 2020 Q4 "Clinical Examples in Radiology Newsletter"
- Your billing department might have access
- It honestly doesn't have very much specific guidance
- **There is no real authoritative source for how to implement a new code**

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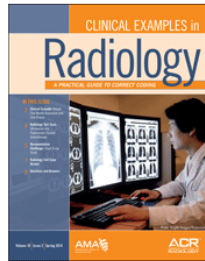
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## Where To get Info?

Jan/Feb 2021 AAPM Newsletter article by Jerry White is the most comprehensive information you'll find published anywhere.

As mentioned, he was involved in a lot of the work creating the code, so was privy to a lot of the materials presented.

## IMAGING MEDICAL PHYSICS CODE 76145 EFFECTIVE JANUARY 1, 2021

### HEALTH POLICY AND ECONOMIC ISSUES REPORT #1

Gerald White, Jr., MS | Consultant, AAPM Professional Economics Committee  
Colorado Associates in Medical Physics



The AMA CPT Editorial Panel has introduced a new CPT code that will be used to describe the work of imaging medical physicists in interventional radiology (76145, *Medical physics dose evaluation for radiation exposure that exceeds institutional review threshold, including report.*) This code will become effective January 1, 2021. This is the first CPT code that explicitly recognizes the efforts of imaging medical physicists when providing services for an individual patient. The creation of the code was the result of a multi-year cooperative

effort of the AAPM, American College of Radiology, Society of Interventional Radiology, and the American College of Cardiology.

The code is designed to record the substantial work that is associated with a careful, patient-specific dose evaluation for patients who have undergone one or more high dose procedures (typically interventional radiology) and for whom an individualized dose calculation is medically warranted due to the likelihood of serious deterministic radiation effects. It is not intended for use when estimating the dose relating to stochastic effects from fetal or other non-high-dose procedures. The procedure will be rarely performed; estimates are that less than 20,000 patients of the more than 8 million who undergo

Email: [gerald.white@mindspring.com](mailto:gerald.white@mindspring.com)

**"The code is designed to record the substantial work that is associated with a careful, patient-specific dose evaluation for patients who have undergone one or more high dose procedures (typically interventional radiology) and for whom an individualized dose calculation is medically warranted due to the likelihood of serious deterministic radiation effects."**

# CPT 76145 - When To Use It?

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## Setting a review threshold

“Medical physics dose evaluation for radiation exposure that exceeds institutional review threshold, including report”

- As presented, should only be used for cases with potential serious tissue effects
  - Estimated < 20k uses out of ~ 8M annual FGI cases ( ~ 0.25% of cases)
  - Recent CVIR publication showed ~ 0.3% of FGI cases had a CAK > 5 Gy
- AMA materials mention that doses > 5 Gy may be significant
  - Also specifically mentions doses > 10 Gy
- Wherever you land, you need to have a threshold in policy somewhere
  - If you're far above the ~ 0.25% estimate, your threshold is likely too low

## CPT 76145 - When To Use It?

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### Setting a review threshold – MPPG 12 Fluoroscopy Dose Management

- New medical physics practice guideline coming soon
- Recommends a significant radiation dose level (SRDL) of 5 Gy CAK
- “PSD estimates are not necessary for every procedure in which the dose index exceeds the SRDL”
- “PSD should be performed for all cases of presumed radiogenic tissue reaction or suspected Joint Commission Sentinel Event”
- “As PSD estimates are similar in magnitude but generally lower than  $K_{a,r}$  values, a PSD estimation threshold of 10-12 Gy summed  $K_{a,r}$  is appropriate in most cases.”

## CPT 76145 - Who Orders It?

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- Intended to be a physician ordered code in response to a patient exceeding a dose index threshold
- Could also be used as a reflexive standing order specified by hospital policy
- “Any patient accumulating  $> 10$  Gy cumulative reference point air kerma over a 6-month period, or any patient with a presumed radiogenic tissue reaction, will have a peak skin dose estimate performed”



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## What's The Expectation for the PSD Calculation?

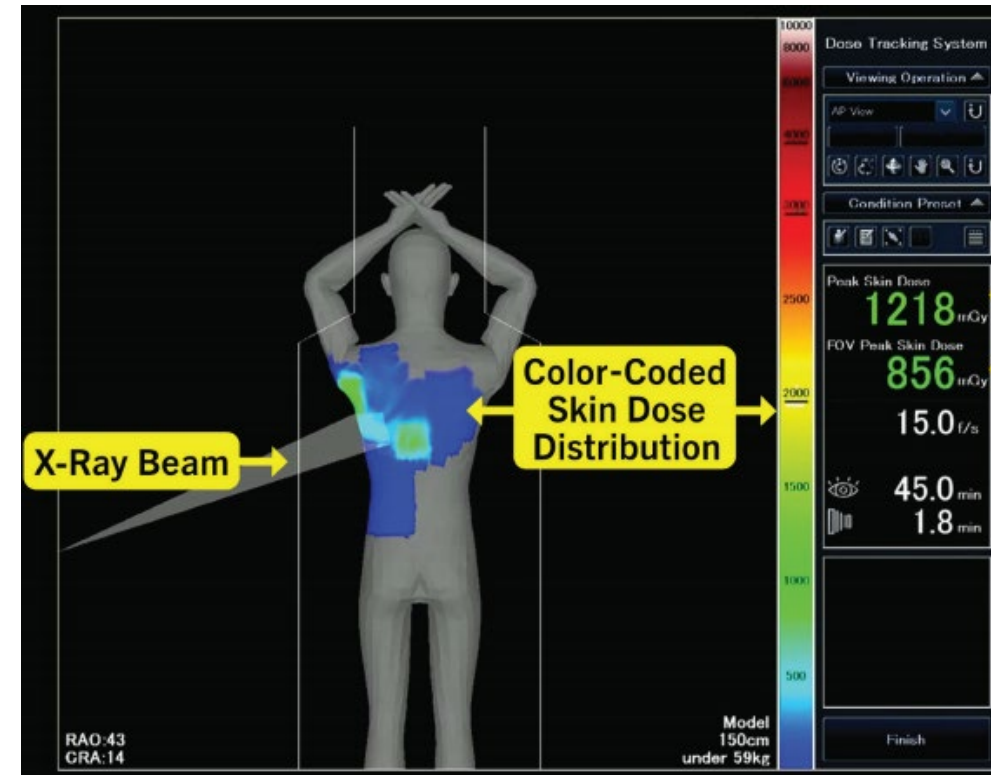
Reimburses for the significant time spent by a QMP doing a manual PSD calculation

### Not OK

- Using CAK value as PSD value
- Pulling a PSD value from an automated system

### OK

- Jones/Pasciak JACMP papers on PSD calculations referenced in AMA talks approving the code
- Corrections for table height, back scatter, table/pad attenuation, dose meter accuracy, field overlap, etc. for each imaging segment
- Discussions with staff and review of images and RDSR
- Reimbursement value was based off a large survey of physicists and includes assumption of FGI room down time for the physicist to collect some kind of patient specific measurements

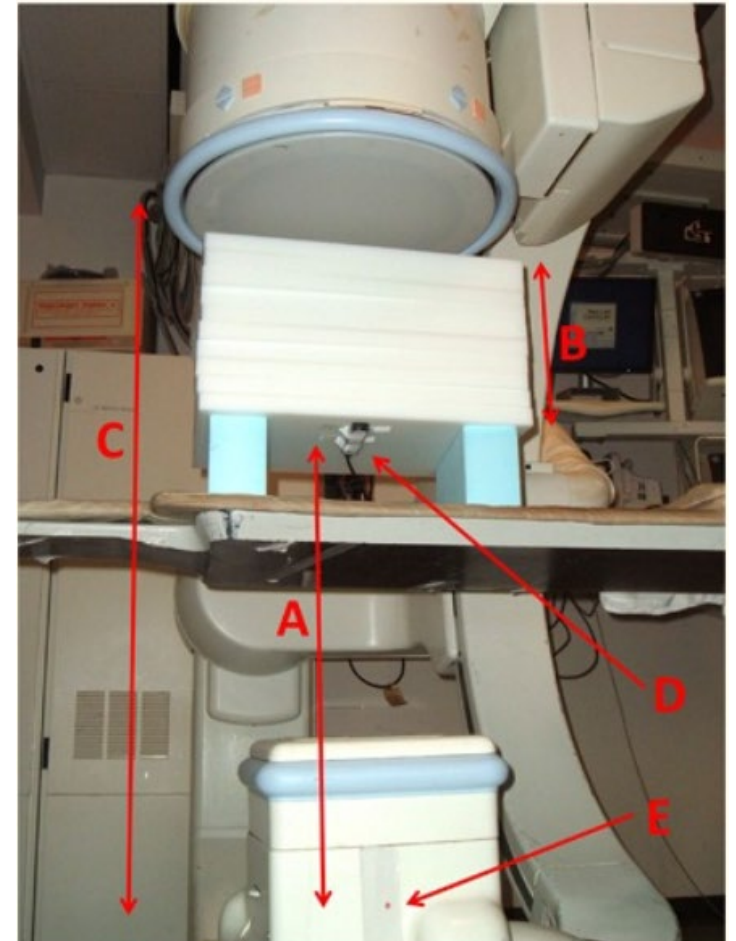


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## Do I Need to Actually Spend Time in a Room?

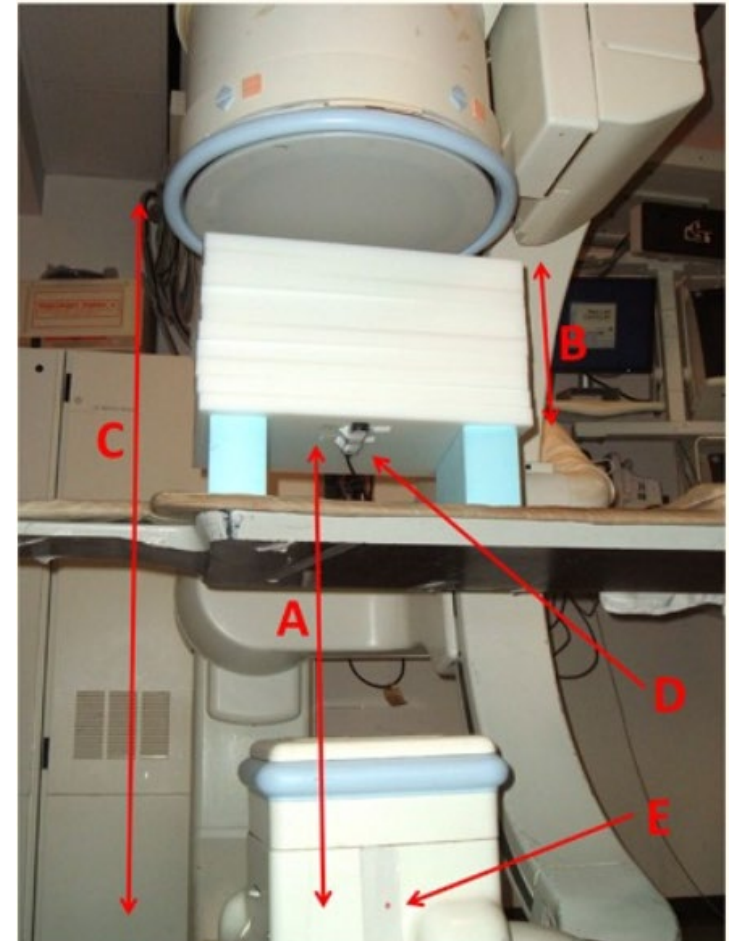
- Prior to CAK meters, PSD estimates would necessitate time in the room with phantoms to determine dose rates
- Possibly not the case now, can pre-emptively verify meter accuracy and collect data during annual testing
- Often other information required for a PSD can be gathered remotely via PACS, RDSRs, dose summary pages, etc.
- May need to expand your annual testing or plan on visiting the room for specific cases



Jones/Paciak JACMP 2012

## Do I Need to Actually Spend Time in a Room?

- Joint Commission requires testing meter accuracy
- AAPM TG-190 gives procedure
  - Recommends measuring both fluoroscopic and acquisition modes at a single kVp
  - Consider checking at various kVps
- Room specific table and pad attenuation
- No guidance from an authoritative source to say whether annually testing is sufficient
- Use your best judgement



Jones/Paciak JACMP 2012

# What Goes in the Report?

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## Calculation Details

- Physicist's report needs to include:
  - Detailed results of the peak skin dose calculation
  - Recommendations for follow-up
- “Peak skin dose = 8 Gy” not sufficient
- Include dose index values and assumptions and corrections that went into getting the PSD
- Can include significant doses to other regions as well, details of prior cases, break out by fluoroscopy/acquisition exposure, etc.
- MPPG 12 recommends reporting a range of possible values, as well as a likely PSD
  - “...depending on various assumptions made regarding variable procedure aspects such as table height, collimation and beam angulation, a PSD estimate could be documented as “likely 13 Gy, but with a possible range of 8-18 Gy”

# What Goes in the Report?

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## Recommendation for Follow-up

- Along with dose estimate, include:
  - Range of expected tissue reactions
  - Timing
  - Recommendation for follow up

“Patient had two visceral interventional procedures on 04-18-21 and 4-19-21 yielding an estimated likely total peak skin dose of 10.5 Gy to the lower left flank. Due to uncertainties with peak skin dose estimates, the actual peak dose could lie within a range of 7-13 Gy.

For acute radiation doses in this range, expected potential tissue reactions include epilation and possible erythema with dry or moist desquamation occurring within 2-8 weeks after the procedures. These effects are likely to be transient, but could be prolonged or permanent, depending on patient sensitivities. Patient should have a follow up visit in approximately 4 weeks and any observed tissue reactions that do not resolve within an ~ 8-week period should be evaluated by a dermatologist.”

## What Goes in the Report?

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- Keep in mind the audience for the report
  - Performing physician – needs the clinical information easily accessible
  - Medical Coders/Billing – will be determining if your report meets their standards
- Likely best to have similar to an annual equipment survey or shielding design report:
  - Summary page with total dose estimate & recommendation
  - Followed by details of the calculation
- Probably better to overestimate what goes into the report than underestimate, initially
- Needs to be signed by a QMP
- Needs to go in the patient's medical record

## Report Examples

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MicroHeaven

### Fluoroscopic Peak Skin Dose Estimate Summary


Patient:

Jones, K

**Comments:** Patient had two visceral interventional procedures with a cumulative reference point air kerma of 12.5 Gy, which is approximately the peak skin dose.

**Fluoroscopic Peak Skin Dose Estimate Summary**

Patient: Jones, K.  
 Pt MRN: 8675309  
 Physician: Ryan Fisher, PhD  
 Date of Calculation: 4/20/2021



**Comments:** Patient had two visceral interventional procedures on 04-18-21 and 4-19-21 yielding an estimated likely total peak skin dose of 10.5 Gy to the lower left flank. Due to uncertainties with peak skin dose estimates, the actual peak dose could lie within a range of 7-13 Gy. Specific factors and assumptions associated with the peak skin dose estimate can be found on the following page(s).

**Follow-up:** For acute radiation doses in this range, expected potential tissue reactions include epilation and possible erythema with dry or moist desquamation occurring within 2-8 weeks after the procedures. These effects are likely to be transient, but could be prolonged or permanent, depending on patient sensitivities. Patient should have a follow up visit in approximately 4 weeks and any observed tissue reactions that do not resolve within an ~ 8-week period should be evaluated by a dermatologist."

**Total Estimated PSD = 10,509 mGy (7,000 - 13,000 mGy possible range)**

**Procedure 1: Spinal Artery Embolization**

**Date:** 4/18/2021

**Total Air Kerma (mGy):** 5,280

**Total contribution to PSD (mGy):** 3,852

**Procedure 2: Celiac Artery**

**Date:** 4/19/2021

**Total Air Kerma (mGy):** 7,275

**Total contribution to PSD (mGy):** 6,657

<b>Procedure 2:</b>	Celiac Artery	
<b>Procedure Date:</b>	4/19/2021	
<b>Fluoro Equipment:</b>	Room 22, Siemens Artis Icono	
Total Air Kerma at reference plane =	7,275	mGy
Fluoroscopic AK =	3,500	mGy
Acquisition AK =	3,775	mGy
Table and Pad Transmission Factor =	0.8	
Fluoro BSF =	1.3	
Acquisition BSF =	1.35	
Procedure table height during case =	57	cm
Interventional Reference Plane =	60	cm
Total AK corrected for Table, Pad & BSF =	8,551	mGy
Potential reduction for non-overlapping views =	1,500	mGy
Ratio of mass attenuation coefficients (tissue/air) =	1.06	
Correction factor for Ka,r meter	0.9	
Potential Peak Skin Dose Contribution =	6,657	mGy

Includes additional summaries for each procedure. Could also include vendor dose summary report or list of acquisitions and angles to show how you determined which fields were non-overlapping



**Probably?**

## How Much is the Code Worth?

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- RVS Update Committee (RUC) performed a nation-wide survey of physicists and landed on an RVU of 24.89
  - Practice Expense (PE) only, no physician work RVU component
  - ~ \$800 reimbursement from CMS by Physician Fee Schedule (PFS)
- Hospital Outpatient Prospective Payment System (HOPPS)
  - Arbitrarily set reimbursement at ~ \$130 using rad onc codes as a guide
  - **Not indicative of the cost to provide the service**
  - ACR/AAPM/SIR/ASTRO all made comments about fixing this problem but were ignored
  - Not likely to be fixed anytime soon, but will be re-evaluated in a few years based on what hospital's chargemaster prices are for the code
- Your hospital will ultimately set its own chargemaster price for the code
  - **If you're working with billing to set pricing, make sure they're aware of the HOPPS screw up and that the Physician Fee Schedule price is more indicative of the cost to provide the service**



## How to Set Up CPT 76145 at Your Facility?

- Talk to your billing and IT people to make sure they're aware it exists
- Need to add order in your systems
  - Likely at the EMR level and not RIS since could be ordered from cardiology or vascular surgery as well
- Update system policies for when the code is used
- Billing department will need to set chargemaster fee for the code
  - Ours says they look at the CMS values and survey the top insurance providers they deal with to set pricing
  - We're still working on this part

## Big Picture

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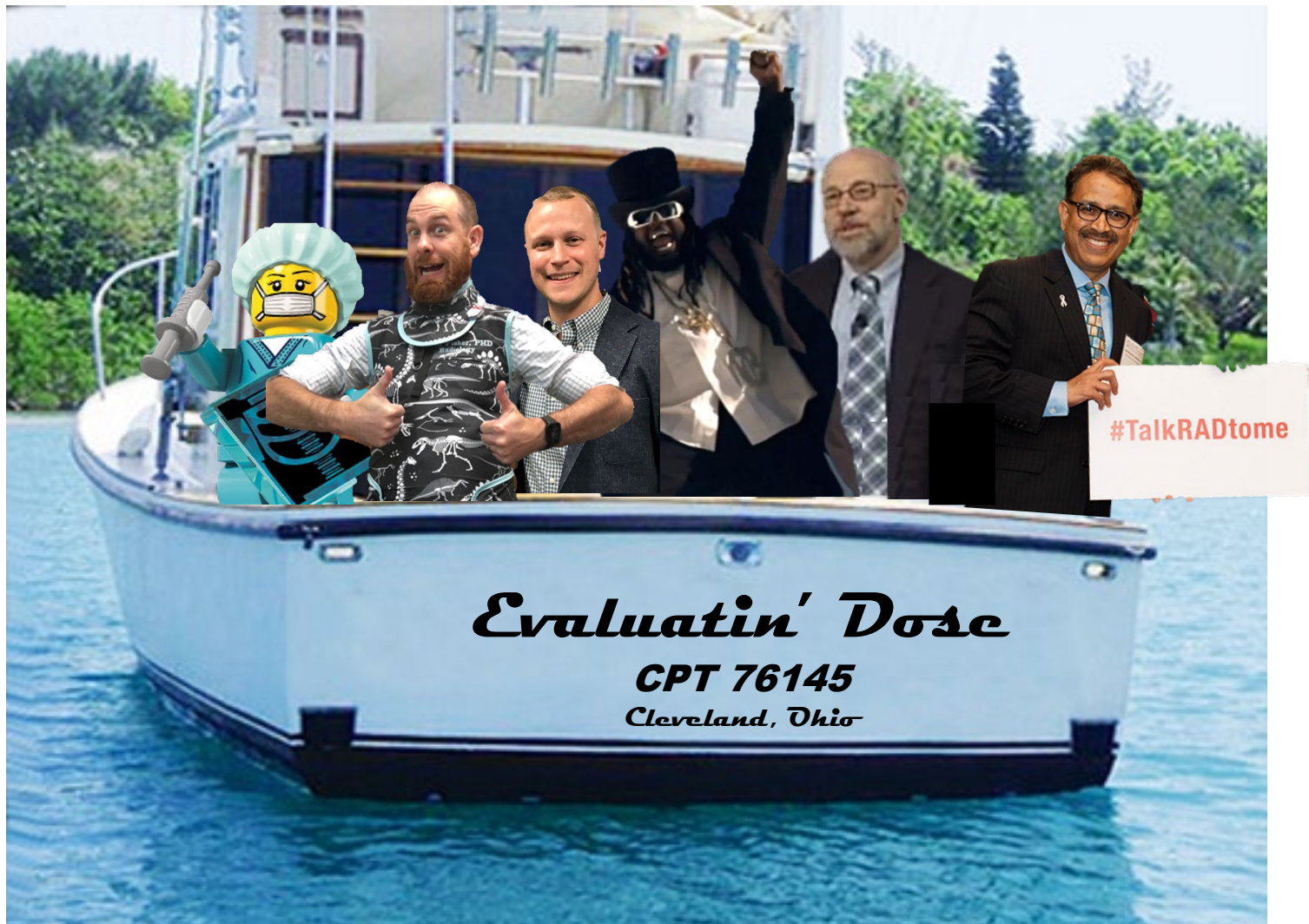
- This is a new code, and new territory for DX physicists
- Physicist will be involved in:
  - Helping facilities set up the code and pricing
  - Setting up the policy and threshold
  - Doing the PSD calculation and providing the report
- There are no real, definitive, step by step instructions for how to implement
  - Possible MPPG coming on this minimum expectations for PSD and report
- Regardless of how your facility approaches it, this is a professional task producing a signed report for a patient's medical record
- You should have a defensible process for making a good faith effort to estimate PSD

## Big Picture

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- Insurers, including CMS, could find fault with your methodology and reject claims
- If the code is abused, it will go away
- If it's not used at all, it will go away
- If you knowingly abuse it, that's insurance fraud
- Getting to this point was not a trivial task and involved a lot of work by a lot of people at ACR, AAPM, etc. with backing by SIR and ACC
- **It's in our best interest as a profession to use it, and use it appropriately, as it could open the door to more DX codes in the future**
  - Fetal dose estimates
  - Patient specific MR implant safety research

# Thanks!



Thanks to Dustin Gress,  
Jerry White, and Mahadevappa  
Mahesh for their time and input for  
this talk, and for the CPT code

