Preview of ABS New Consensus Guidelines: Medical Physics Residency Training in HDR Remote Afterloader Brachytherapy

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No well-defined requirements for medical physicist residency training on brachytherapy.

ACGME

1. The primary clinical site must have the following technologies available ..... high- and/or low-dose-rate interstitial and intracavitary brachytherapy.
2. Resident must demonstrate competence in performing interstitial and intracavitary brachytherapy procedures.
3. Each resident must perform at least seven interstitial and 15 intracavitary brachytherapy procedures.
   - Of the required intracavitary brachytherapy procedures, a minimum of five must be tandem-based insertions for at least two patients.
   - Of the required intracavitary brachytherapy procedures, no more than five should be cylinder insertions.

CAMPEP

1. Minimum requirements for completing a residency in radiation oncology physics....
   - Conduct system calibrations, performance evaluations and quality control, safety and compliance tests, including vendor specifications, under supervision of a qualified physicist....
     - Brachytherapy implants (temporary/permanent).
     - Brachytherapy applicators, LDR, HDR.
   - Treatment planning and delivery...
     - Brachytherapy treatment plans and QA.

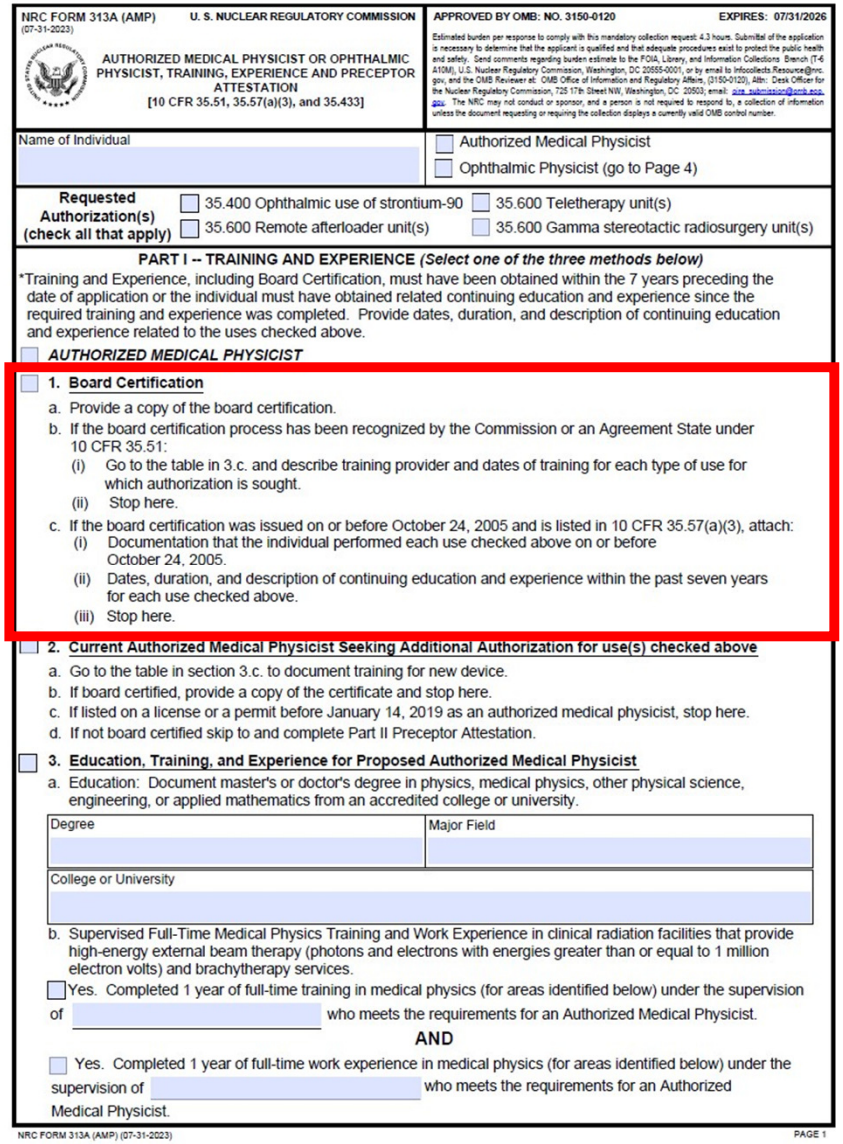
AAPM TG249 (Published in 2013)

Essentials and Guidelines for Clinical Medical Physics Residency Training Programs

- **Facilities:** equipment required to perform interstitial and intracavitary brachytherapy procedure, including a HDR afterloading treatment unit.
- **Caseload:** number of new brachytherapy patients treated per year should be sufficient to ensure the resident is adequately trained…permit a clinical resident o become competent and proficient…
- **Competency Examples:**
  - performs brachytherapy tx plans for a cylindrical GYN applicator;
  - Performs brachytherapy tx plans for cervical applicator (T&O, T&R);
  - develops interstitial brachytherapy tx plans….

In Addition…

- The ABR stopped issuing AMP-Eligible designations on ABR certificates issued after December 31st, 2023.
- What does that mean to med phys residents or for anyone who is looking to be an Authorized Medical Physicist?



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AUTHORIZED MEDICAL PHYSICIST OR OPHTHALMIC PHYSICIST, TRAINING, EXPERIENCE AND PRECEPTOR ATTESTATION
[10 CFR 35.51, 35.57(a)(3), and 35.433]

Name of Individual

☐ Authorized Medical Physicist
☐ Ophthalmic Physicist (go to Page 4)

Requested Authorization(s) (check all that apply)
☐ 35.400 Ophthalmic use of strontium-90 ☐ 35.600 Teletherapy unit(s)
☐ 35.600 Remote afterloader unit(s) ☐ 35.600 Gamma stereotactic radiosurgery unit(s)

PART I -- TRAINING AND EXPERIENCE ***(Select one of the three methods below)***

*Training and Experience, including Board Certification, must have been obtained within the 7 years preceding the date of application or the individual must have obtained related continuing education and experience since the required training and experience was completed. Provide dates, duration, and description of continuing education and experience related to the uses checked above.

☐ ***AUTHORIZED MEDICAL PHYSICIST***

☐ **1. Board Certification**

a. Provide a copy of the board certification.
b. If the board certification process has been recognized by the Commission or an Agreement State under 10 CFR 35.51:
(i) Go to the table in 3.c. and describe training provider and dates of training for each type of use for which authorization is sought.
(ii) Stop here.
c. If the board certification was issued on or before October 24, 2005 and is listed in 10 CFR 35.57(a)(3), attach:
(i) Documentation that the individual performed each use checked above on or before October 24, 2005.
(ii) Dates, duration, and description of continuing education and experience within the past seven years for each use checked above.
(iii) Stop here.

☐ **2. Current Authorized Medical Physicist Seeking Additional Authorization for use(s) checked above**

a. Go to the table in section 3.c. to document training for new device.
b. If board certified, provide a copy of the certificate and stop here.
c. If listed on a license or a permit before January 14, 2019 as an authorized medical physicist, stop here.
d. If not board certified skip to and complete Part II Preceptor Attestation.

☐ **3. Education, Training, and Experience for Proposed Authorized Medical Physicist**

a. Education: Document master's or doctor's degree in physics, medical physics, other physical science, engineering, or applied mathematics from an accredited college or university.

Degree	Major Field

College or University

b. Supervised Full-Time Medical Physics Training and Work Experience in clinical radiation facilities that provide high-energy external beam therapy (photons and electrons with energies greater than or equal to 1 million electron volts) and brachytherapy services.

☐ Yes. Completed 1 year of full-time training in medical physics (for areas identified below) under the supervision of _____ who meets the requirements for an Authorized Medical Physicist.

AND

☐ Yes. Completed 1 year of full-time work experience in medical physics (for areas identified below) under the supervision of _____ who meets the requirements for an Authorized Medical Physicist.

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AUTHORIZED MEDICAL PHYSICIST OR OPHTHALMIC PHYSICIST, TRAINING, EXPERIENCE AND PRECEPTOR ATTESTATION [10 CFR 35.51, 35.57(a)(3), and 35.433] (continued)

3. Education, Training, and Experience for Proposed Authorized Medical Physicist (continued)

b. Supervised Full-Time Medical Physics Training and Work Experience (continued)
If more than one supervising individual is necessary to document supervised training, provide multiple copies of this page.

Description of Training/ Experience	Location of Training/License or Permit Number of Training Facility/Medical Devices Used+	Dates of Training*	Dates of Work Experience*
Medical Physics			
Performing sealed source leak tests and inventories			
Performing decay corrections			
Performing full calibration and periodic spot checks of external beam treatment unit(s)			
Performing full calibration and periodic spot checks of stereotactic radiosurgery unit(s)			
Performing full calibration and periodic spot checks of remote afterloading unit(s)			
Conducting radiation surveys around external beam treatment unit(s), stereotactic radiosurgery unit(s), remote after loading unit(s)			

Supervising Individual**	License/Permit Number listing supervising individual as an authorized Medical Physicist

for the following types of use:

☐ Remote afterloader unit(s) ☐ Teletherapy unit(s) ☐ Gamma stereotactic radiosurgery unit(s)

\+ Training and work experience must be conducted in clinical radiation facilities that provide high-energy external beam therapy (photons and electrons with energies greater than or equal to 1 million electron volts) and brachytherapy services.

* 1 year of Full-time medical physics training and 1 year of full time work experience cannot be concurrent.

** If the supervising medical physicist is not an authorized medical physicist, the licensee must submit evidence that the supervising medical physicist meets the training and experience requirements in 10 CFR 35.51 and 35.59 for the types of use for which the individual is seeking authorization.

3. Education, Training, and Experience for Proposed Authorized Medical Physicist (continued)

c. Describe training provider and dates of training for each type of use for which authorization is sought.

Description of Training	Training Provider and Dates		
	Remote Afterloader	Teletherapy	Gamma Stereotactic Radiosurgery
Hands-on device operation			
Safety procedures for the device use			
Clinical use of the device			
Treatment planning system operation			

Supervising Individual *If training is provided by Supervising Medical Physicist, (If more than one supervising individual is necessary to document supervised training, provide multiple copies of this page.)*	License/Permit Number listing supervising individual as an authorized Medical Physicist

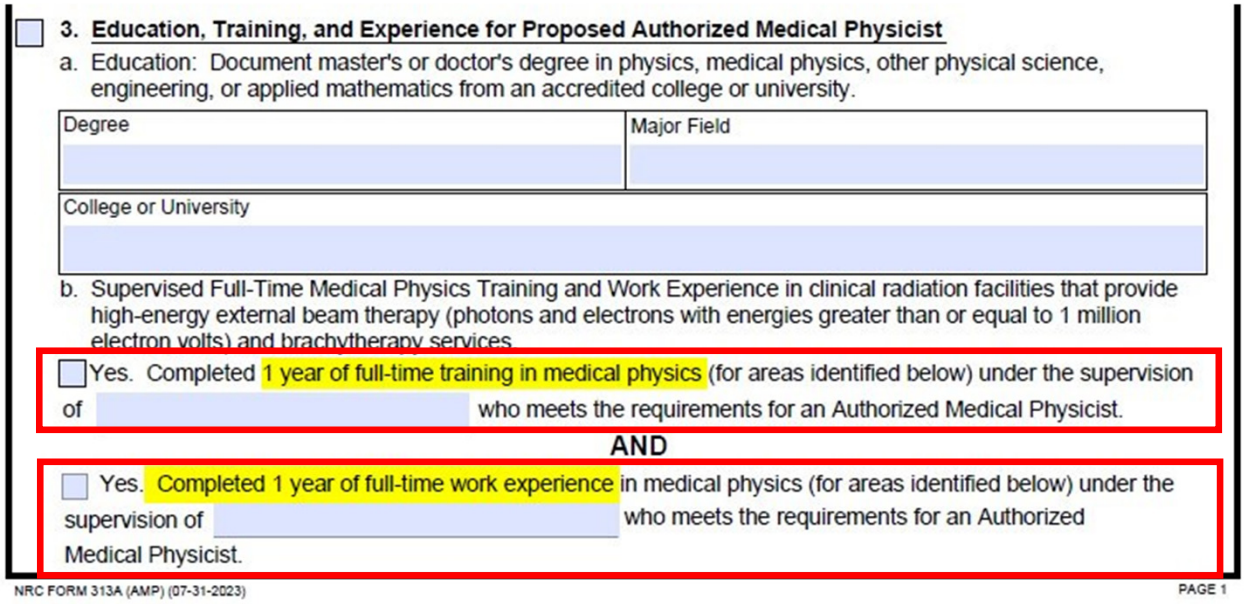
for the following types of use:

☐ Remote afterloader unit(s) ☐ Teletherapy unit(s) ☐ Gamma stereotactic radiosurgery unit(s)

Who is involved?

- 15 medical physicists from 14 institutions were in this group effort:
  - UU, Yale, Rush, WashU, U Michigan, TJU, Wake Forest, Mayo, UAB, UCSD, Houston Methodist, Emory, UC Davis, and Moffitt.
  - Average ≥18 years of experiences, range: 5~30 years.
  - All very involved in brachytherapy trainings and educations.
  - Wide varieties of experiences in treatment modalities and techniques.

How did we come up with the consensus?



☐ **3. Education, Training, and Experience for Proposed Authorized Medical Physicist**

a. Education: Document master's or doctor's degree in physics, medical physics, other physical science, engineering, or applied mathematics from an accredited college or university.

Degree	Major Field

College or University

b. Supervised Full-Time Medical Physics Training and Work Experience in clinical radiation facilities that provide high-energy external beam therapy (photons and electrons with energies greater than or equal to 1 million electron volts) and brachytherapy services

☐ Yes. Completed 1 year of full-time training in medical physics (for areas identified below) under the supervision of _____ who meets the requirements for an Authorized Medical Physicist.

AND

☐ Yes. Completed 1 year of full-time work experience in medical physics (for areas identified below) under the supervision of _____ who meets the requirements for an Authorized Medical Physicist.

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3. Education, Training, and Experience for Proposed Authorized Medical Physicist (continued)

b. Supervised Full-Time Medical Physics Training and Work Experience (continued)

If more than one supervising individual is necessary to document supervised training, provide multiple copies of this page.

Description of Training/ Experience	Location of Training/License or Permit Number of Training Facility/Medical Devices Used+	Dates of Training* (1)	Dates of Work Experience* (2)
Medical Physics			
Performing sealed source leak tests and inventories			
Performing decay corrections			
Performing full calibration and periodic spot checks of external beam treatment unit(s)			
Performing full calibration and periodic spot checks of stereotactic radiosurgery unit(s)			
Performing full calibration and periodic spot checks of remote afterloading unit(s)			
Conducting radiation surveys around external beam treatment unit(s), stereotactic radiosurgery unit(s), remote after loading unit(s)			

Supervising Individual**	License/Permit Number listing supervising individual as an authorized Medical Physicist

for the following types of use:

☐ Remote afterloader unit(s) ☐ Teletherapy unit(s) ☐ Gamma stereotactic radiosurgery unit(s)

\+ Training and work experience must be conducted in clinical radiation facilities that provide high-energy external beam therapy (photons and electrons with energies greater than or equal to 1 million electron volts) and brachytherapy services.

* 1 year of Full-time medical physics training and 1 year of full time work experience cannot be concurrent.

** If the supervising medical physicist is not an authorized medical physicist, the licensee must submit evidence that the supervising medical physicist meets the training and experience requirements in 10 CFR 35.51 and 35.59 for the types of use for which the individual is seeking authorization.

3. Education, Training, and Experience for Proposed Authorized Medical Physicist (continued)

c. Describe training provider and dates of training for each type of use for which authorization is sought.

Description of Training	Training Provider and Dates		
	Remote Afterloader	Teletherapy	Gamma Stereotactic Radiosurgery
Hands-on device operation			
Safety procedures for the device use			
Clinical use of the device			
Treatment planning system operation			

Supervising Individual *If training is provided by Supervising Medical Physicist, (If more than one supervising individual is necessary to document supervised training, provide multiple copies of this page.)*	License/Permit Number listing supervising individual as an authorized Medical Physicist

for the following types of use:

☐ Remote afterloader unit(s) ☐ Teletherapy unit(s) ☐ Gamma stereotactic radiosurgery unit(s)

Level I Requirement

- Minimum Standard to Fulfill During Residency

QA & Radiation Safety

Level I Requirement
Describe: • QA equipment needs • Sealed source leak tests and inventories • QA procedures for HDR remote afterloader, applicators, and TPS • Purpose of radiation surveys • Shipping requirements • HDR vault shielding design • Annual dose limits • Legal and regulatory rules, including licensing and written directive requirements **Perform:** • Decay correction calculations • QA procedures for HDR remote afterloader, applicators, and treatment planning system(s)* **Participate, when applicable+:** • Emergency training and drills • HDR-specific radiation safety trainings • In-service and refresher training

*Can be either able to describe or able to perform, depending on the training program and trainee's capability.

+The trainee should participate in relevant all HDR brachytherapy program training elements provided by the training site(s).

Clinical

Level I Requirement
Describe: • Relevant literature (see Table 1) • Emergency procedures • Applicator selection and MRI compatibility • Simulation and imaging protocols • Treatment procedures • Standard prescription and fractionation patterns • HR-CTV and OAR dose tolerances • How to establish an HDR brachytherapy program **Perform or Operate** • HDR treatment planning system • Calculation for 2-Gy Equivalent Doses (EQD2) • Plan checks **Participate in:** • Treatment deliveries (on trained applicator types) • A minimum of 10 3D planned HDR cases++ with supervision (at least 6 non-single channel applicators)

++May be entirely intracavitary cases.

Level II Requirement

- Minimum Training to Satisfy NRC Work Experience During or Post-Residency

QA & Radiation Safety

Level II Requirement

Perform:

- All Level I requirements
- HDR applicator and TPS acceptance testing and commissioning
- Design and perform QA processes for a new applicator or new treatment technique
- Provide clinical recommendations for treatment choices/techniques, including imaging modalities
- Able to provide emergency training for other staff
- Able to draft and maintain relevant policies and procedures
- Able to design an HDR brachytherapy program meeting applicable radiation safety and regulatory requirements, as well as recommendations from professional societies

Clinical

Level II Requirement

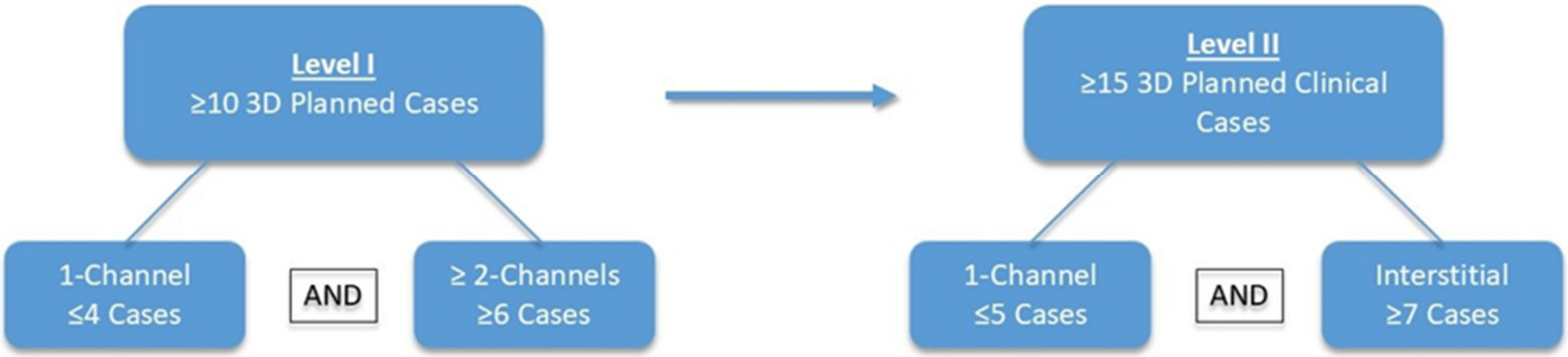
Perform:

- All Level I requirements, including simulation, applicator preparation, planning, treatment delivery, and physics plan check, independently+
- The minimum number of cases from Level I
- The minimum of 15 3D planned clinical cases (at least 7 are interstitial procedures; Level I cases may contribute to this total at the discretion of the supervising staff)* independently+

+Trainees should be able to perform these tasks independently, although the tasks will be performed under the appropriate level of supervision.

*All 7 cases could utilize hybrid applicators. Each case could count towards as either intracavitary OR interstitial, but not both. No more than 5 single-channel implants may be counted.

Case Counts Simplified



- Focuses on 1-3 channels.
- Can be virtual planning and using phantom cases.
- Competency can be evaluated in separate steps (e.g., treatment planning competency and treatment delivery competency evaluated in different cases/fractions)
- Under personal supervision -> direct supervision.

- It is possible for cases counted in Level I to be counted in Level II (institution discretion, depending on competency).
- A case can be counted as interstitial or intracavitary, but no double counting.
- Clinical cases performed in real-time only.
- Direct supervision, except for treatment delivery which requires the AMP's presence.

Medical Physics Training in High-Dose-Rate Remote Afterloader Brachytherapy

Level 1 & Level 2 Logs

Candidate Name: _____ Program: _____

Level 1 Log (≥ 10 3D planned cases)

Single Channel Cases (≤ 4 cases)				
Date	**Disorder**	**Applicator Type**	**# of Channels**	**Preceptor Signature**
Multi-Channel Cases (≥ 6 cases)				
Date	**Disorder**	**Applicator Type**	**# of Channels**	**Preceptor Signature**

Candidate Name: _____ **Program:** _____

Level 2 Log (≥ 15 3D Planned Clinical Cases)

Single Channel Cases (≤ 5 cases)				
Date	**Disorder**	**Applicator Type**	**# of Channels**	**Preceptor Signature**
Other Multi-Channel Cases (≥ 3 cases)				
Date	**Disorder**	**Applicator Type**	**# of Channels**	**Preceptor Signature**
Interstitial Cases (≥ 7 cases)				
Date	**Disorder**	**Applicator Type**	**# of Channels**	**Preceptor Signature**

What about LDR and other brachytherapy techniques?

Questions/Suggestions?