

# What is Medical Physics 3.0 ?

Cheng B Saw, PhD, FAAPM

Director - Physics, Northeast Radiation Oncology Centers

President, CBSaw Publishing, LLC

Lecture Time: 13:00-13:30 March 1, 2024

[cbsaw2003@yahoo.com](mailto:cbsaw2003@yahoo.com)

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15<sup>th</sup> Thai Medical Physics Society  
Rua Rasada Hotel, Trang, THAILAND

Mar 1-3, 2024

# Introduction


1. Chiang Mai University
2. Future Trend in Medical Physics
  - new technology
  - after COVID-19
3. Medical Physics 3.0
  - Medical Physics realigned

cbsaw2003@yahoo.com  
<http://www.cbsaw.com>



Medical Physics Chiang Mai University

## Project of Inbound Visiting Professor, 2024



**Prof. Cheng B Saw, PhD, FAAPM**  
Director of Medical Physics  
Northeast Radiation Oncology Centers (NROC)  
Dunmore, Pennsylvania, USA


Onsite at Conference Room  
Department of Radiology  
1<sup>st</sup> Floor Boonsom Martin building

Or Online via Zoom



ID: 990 7278 7148  
Passcode: 777777

25 March 2024	14:00-15:00
What is AAPM in Medical Physics 3.0?	
26 March 2024	10:00-11:30
How to take advantage of the 3D treatment planning tools to develop treatment plans, issues and principles	
	13:30-14:30
New methodology in Radiotherapy quality management (TG100)	
27 March 2024	10:00-11:00
Clinical Topics: Basic to Advance Radiotherapy Techniques (ART SBRT TBI TMI)	
29 March 2024	09:00-10:00
Kantary Hills Hotel, MP curriculum Annual Meeting	
Research trends in Medical Physics, research methodology and publication	



Kantary Hills Hotel, Chiang Mai, Thailand  
Mar 1-3, 2024

# Introduction

1. Chiang Mai University
2. Future Trend in Medical Physics
  - after COVID-19
3. Medical Physics 3.0
  - Medical Physics realign

The screenshot displays the AAPM Virtual Library interface. At the top left is the AAPM logo with the tagline 'Improving Health Through Medical Physics'. The main header reads 'AMERICAN ASSOCIATION of PHYSICISTS IN MEDICINE'. A navigation menu on the left lists various categories such as 'My AAPM', 'AAPM', 'Public & Media', 'International', 'Medical Physicist', 'Membership', 'Students', 'Meetings', 'Education', 'Quality & Safety', 'Government Affairs', 'Publications', 'Career Services', 'Corporate Affiliates', 'Links of Interest', 'Advertising Opportunities', and 'Logout'. The main content area features a video player titled 'AAPM VIRTUAL LIBRARY' for the '2017 AAPM Annual Meeting - Session: Medical Physics 3.0 in Design'. The video content shows a slide titled 'Why Med Phys 3.0?' with two bullet points: 'The crucial role of Medical Physics has to be broadly claimed' and 'In the face of a challenge, it is crucial to understand the goals and set a standard that can define the trajectory and motivate the progression.' Below the video is a satisfaction survey: 'With 6 responding, average satisfaction with this presentation (higher is better): 4.83'. The survey asks 'How satisfied are you with this presentation?' and includes a dropdown menu, a 'submit' button, and a 'Handout(s): 127-35466-418554-126905.pdf' link. A small photo of Ehsan Samei, PhD, is also visible.

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# Outline I

1. Current State of MP 3.0
2. Rationales for MP 3.0
3. Why 3.0 ?
4. Plans for MP 3.0

# Current State of MP 3.0 I

The screenshot shows a Microsoft Bing search interface. The search bar contains the text "medical physics 3.0". Below the search bar, there are navigation links for "SEARCH", "COPILOT", "VIDEOS", "IMAGES", "MAPS", "NEWS", "SHOPPING", and "MORE". The search results section indicates "About 27,500,000 results". The top result is from "aapm.org" with the URL "https://mp30.aapm.org". The title of the result is "The Future of Medical Physics - Medical Physics 3.0". The snippet below the title reads: "Web **Medical Physics 3.0** is AAPM's initiative to create a thriving future for the **medical physics** profession. That means finding new ways to add value to patient care and preparing ...". Below the snippet are several links: "AAPM" (The mission of AAPM is advancing medicine through excellen...), "Career Services" (AAPM Career Services has listings for medical physics jobs i...), "Membership" (Medical Physics Leadership Academy (MPLA): MPLA is a coll...), and "About" (Medical Physics 3.0 (MP3.0) is an initiative to define and pract...).

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# Current State of MP 3.0 II

**MEDPHYS 3.0**

[About](#) [Subcommittees](#) [Inspiring Stories](#) [News & Highlights](#) [FAQ](#)

## Physics for Every Patient

Medical Physics 3.0 is AAPM's initiative to create a thriving future for the medical physics profession. That means finding new ways to add value to patient care and preparing medical physicists to adapt to constant change. We believe physicists have enormous untapped potential to improve human health through their skills and commitment.

You can be part of this movement by sharing a story of how you implemented a new idea or formed a new collaboration

[Learn More](#)

[▶ Watch](#)

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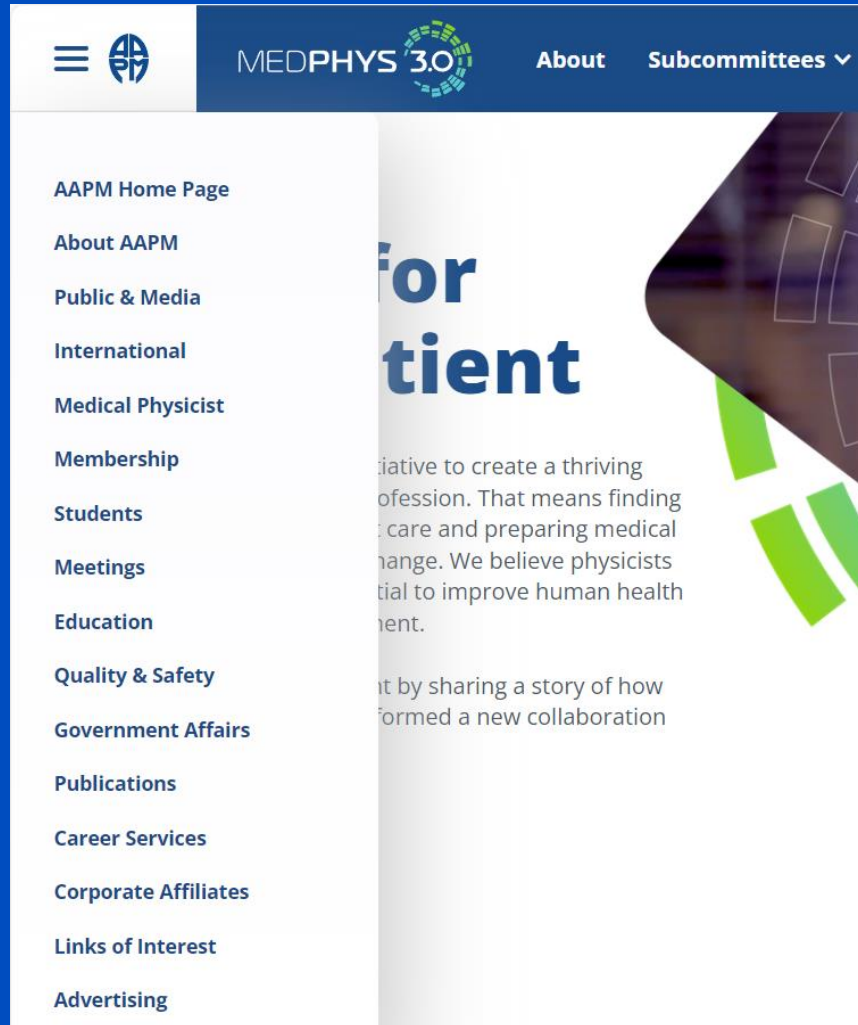
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# Current State of MP 3.0 III

## 1. Website Tab

- Link AAPM
- Formal program



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# Current State of MP 3.0 IV

## 1. Website Tab

- Link AAPM

- Formal program

Home | Directory | Career Services | Continuing Education | BBS | Contact

AA PM AMERICAN ASSOCIATION of PHYSICISTS IN MEDICINE

Improving Health Through Medical Physics

My AAPM

- AAPM
  - Staff Contacts
  - Mission & Strategic Plan
  - Position Statements & Policies
  - Association Governance
  - Committees
    - Committee Classifieds
    - Individual Appointments
    - History & Heritage
    - Chapters
    - Speaker Index
- Public & Media
- International
- Medical Physicist
- Membership
- Students

### AAPM COMMITTEE TREE

#### Medical Physics 3.0 Committee (MP30C)

- [Bookmark this page](#) (bookmarks show under "My AAPM" in the menu to left)  
[Committee Website](#) | [Directory: Committee](#) | [Membership](#)

**Email** You may send email to this group now using [gmail](#) or [outlook](#).  
- or -  
You may save the address [2024.MP30C@aapm.org](mailto:2024.MP30C@aapm.org) to your local address book. This alias updates hourly from the AAPM Directory.

**Activities** To integrate MP 3.0 activities to enact, express, and enhance the full value of physics towards human health into the council working space of the AAPM. That includes practice, administrative, scientific, and educational goals. To identify and explore other areas besides radiotherapy and imaging where medical physicists can work in healthcare.

**By-Laws:** Not Referenced. **Rules:** 3.9.4

**Standing?** This is a standing committee.

**Approved Date(s):** 4/22/2020

**Committee Keywords:** No Keywords Entered

Board of Directors

Professional Council

- Medical Physics 3.0 Cmte [Status]
  - Smart Advocacy SC [Status]
  - Smart Expansion SC [Status]
  - Smart Grassroots SC [Status]

Chair

David Jordan  
Committee Chair

cbsaw2003@yahoo.com

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# Current State of MP 3.0 V

Medical Physics 3.0

About Subcommittees Inspiring Stories News & Highlights FAQ

## What is Medical Physics 3.0?

Redefining and Reinvigorating the Role of Physics in Modern Medicine.

[View Committee Leadership](#)

Medical Physics is at a crossroads. Broad and profound changes in the delivery of healthcare are underway and accelerating, and it is urgent for our profession to address these changes head-on.

We are faced with new mandates to deliver value-based,

# Current State of MP 3.0 VI

The screenshot shows the MEDPHYS 3.0 website. The navigation bar includes a menu icon, the MEDPHYS 3.0 logo, and links for 'About', 'Subcommittees', 'Inspiring Stories', 'News & Highlights', and 'FAQ'. The 'Subcommittees' dropdown menu is open, listing: SMART Practice, SMART Practitioners, SMART Tools, SMART Regulations, SMART Advocacy, SMART Grassroots, and SMART Expansion. The main content area features a large heading 'What is Medical Physics 3.0?' and a sub-heading 'Redefining and Reinvigorating Modern Medicine.' Below this is a 'View' button. A text box on the left contains the following text: 'Medical Physics is at a crossroads. Broad and profound changes in the delivery of healthcare are underway and accelerating, and it is urgent for our profession to address these changes head-on.'

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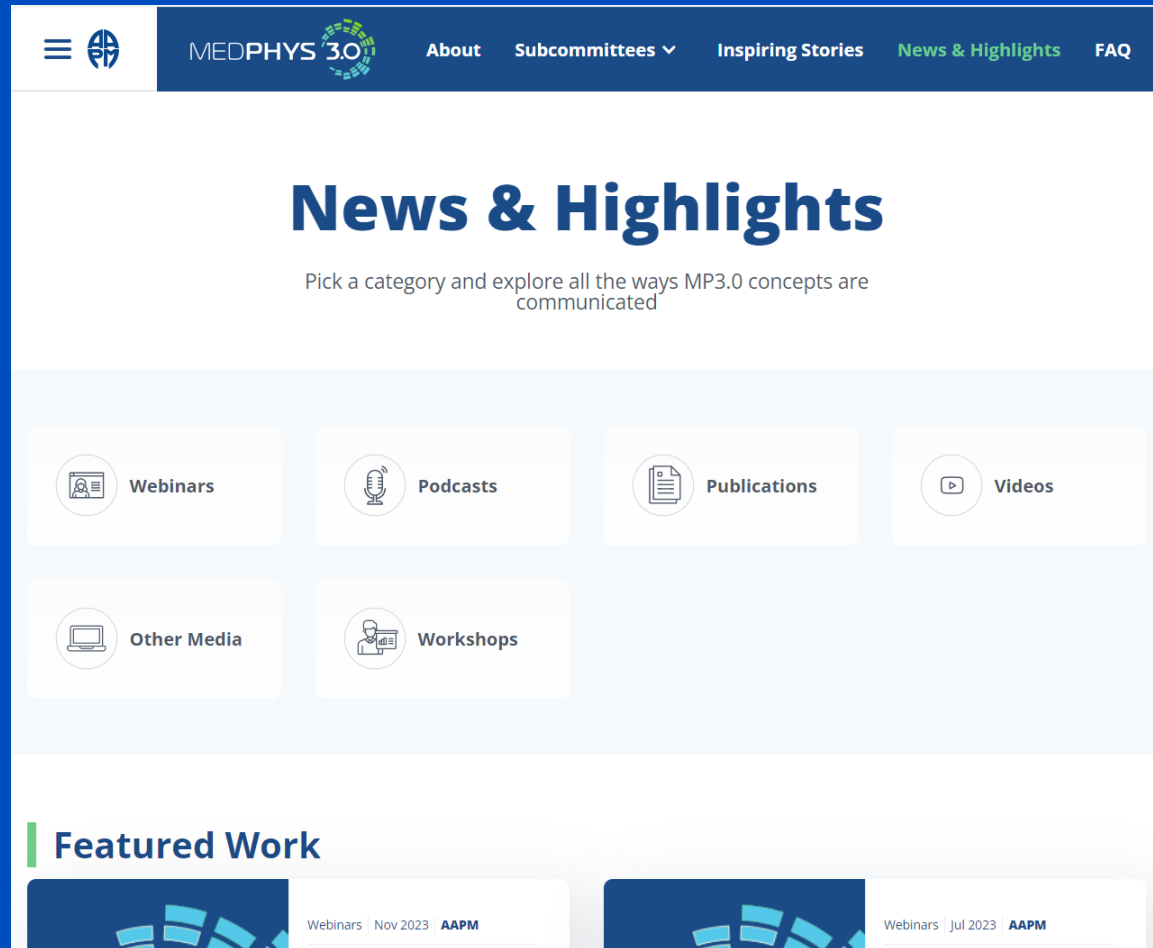
# Current State of MP 3.0 VII

The screenshot shows the top navigation bar of the MEDPHYS 3.0 website. It includes a menu icon, the MEDPHYS 3.0 logo, and links for 'About', 'Subcommittees', 'Inspiring Stories', 'News & Highlights', and 'FAQ'. The main heading is 'Inspiring Stories' with the subtitle 'Success stories from institutions utilizing MP3.0 concepts'. Below this are two category buttons: 'Therapy Stories' (with a clipboard icon) and 'Imaging' (with a monitor icon). A featured article is visible under 'Therapy Stories' with the title 'Watching Videos Helps Kids Avoid Anesthesia During Radiation Therapy' and a small image of a child in a treatment room.

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# Current State of MP 3.0 VIII



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# Current State of MP 3.0 IX

FAQ

Replies about MP3.0 to common questions from medical physicists and the public

## General Inquiries

- What is MP3.0?
- What is MP1.0 and how is it different from MP3.0?
- Why MP3.0 instead of MP2.0?
- How is the MP3.0 Committee structured? What are its deliverables?

# Question and Answer I

Medical Physics (MP) 3.0 was formed in response to the impact of COVID-19

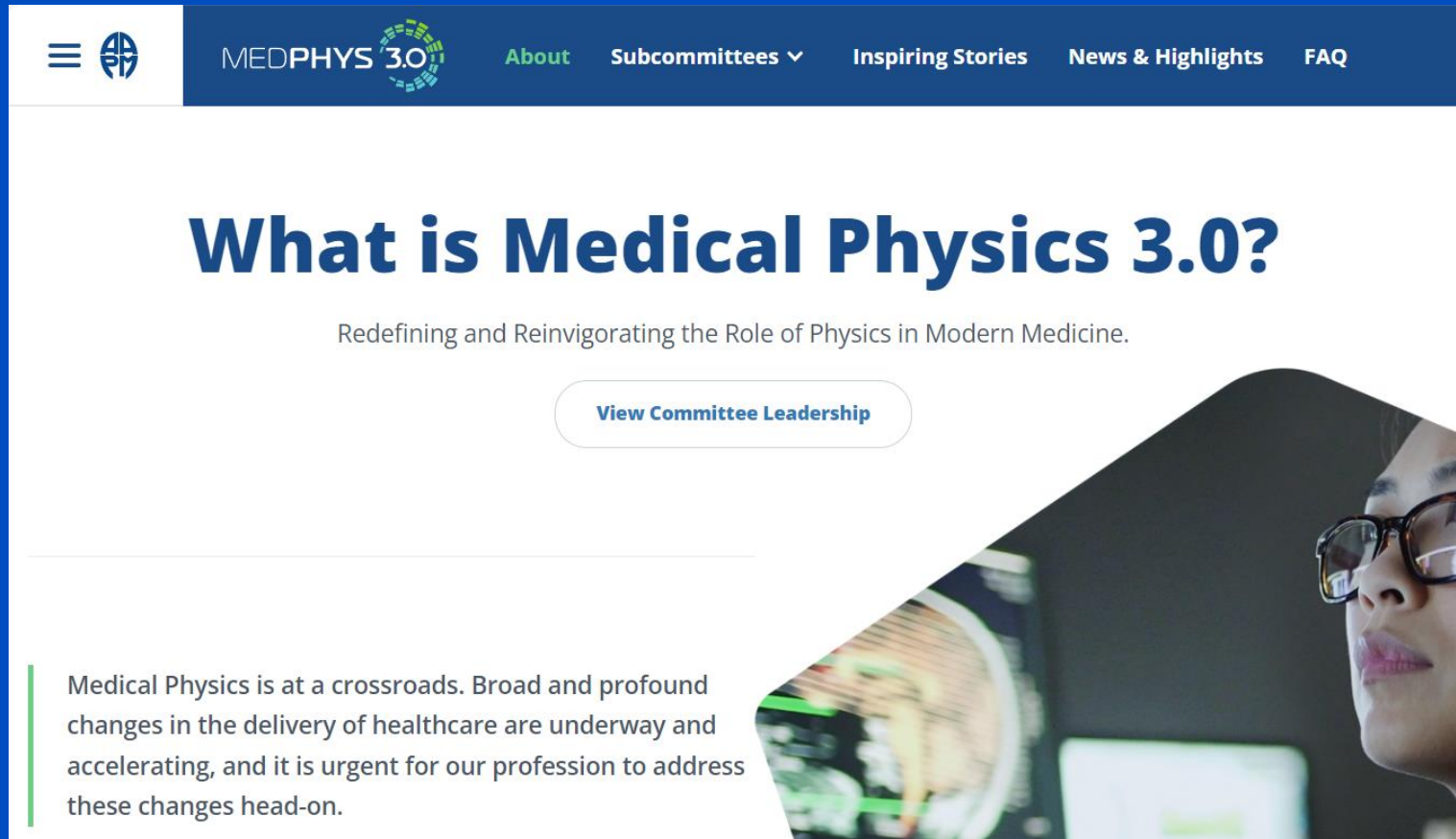
- True or False




# Outline II

1. Current State of MP 3.0
2. Rationales for MP 3.0
3. Why 3.0 ?
4. Plans for MP 3.0

# Rationales for MP 3.0 I



The screenshot shows the top navigation bar of the MEDPHYS 3.0 website. It includes a hamburger menu icon, a logo with a stylized 'M' and 'P' inside a circle, and the text 'MEDPHYS 3.0'. The navigation menu contains links for 'About', 'Subcommittees' (with a dropdown arrow), 'Inspiring Stories', 'News & Highlights', and 'FAQ'. The main content area features a large blue heading 'What is Medical Physics 3.0?' followed by the subtitle 'Redefining and Reinvigorating the Role of Physics in Modern Medicine.' Below this is a button labeled 'View Committee Leadership'. A vertical green line is on the left side of the text block. The background of the main content area is white, with a dark blue curved shape on the right side containing a photograph of a woman wearing glasses looking at a computer monitor displaying a medical scan.

☰  MEDPHYS 3.0 [About](#) [Subcommittees](#) [Inspiring Stories](#) [News & Highlights](#) [FAQ](#)

## What is Medical Physics 3.0?

Redefining and Reinvigorating the Role of Physics in Modern Medicine.

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# Rationales for MP 3.0 II

Medical Physics is at a crossroads. Broad and profound changes in the delivery of healthcare are underway and accelerating, and it is urgent for our profession to address these changes head-on.

# Rationales for MP 3.0 III

We are faced with new mandates to deliver value-based, personalized, and evidence-based medicine. Reimbursements are diminishing at the same time. These realities necessitate medical physics to change. In any progression of this nature, it is crucial to understand the goals and proactively set a standard that can clarify, unify, and motivate the advancement.

# Rationales for MP 3.0 IV

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## Sustainable Practice

Medical Physics 3.0 (MP3.0) is an initiative to define and practice sustainable excellence in medical physics. MP3.0 is re-visiting our roots and re-envisioning our desired contributions to quality healthcare.



## Precision and Innovation

It asks the question of whether we are fulfilling our potential, and if we are not, how we can do so. MP3.0 is based on the core premise that medical physicists have a unique calling and expertise to be scientific agents of precision and innovation in the development and practice of medicine.



## Unique Skills of Medical Physicists

MP3.0 aims to foster a culture within medical physics of seizing such opportunities, engaging proactively and meaningfully in patient care, and growing and building upon the unique skills of medical physicists.



# Rationales for MP 3.0 V



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# Rationales for MP 3.0 VI



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# Rationales for MP 3.0 VII



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# Rationales for MP 3.0 VIII

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# Outline III

1. Current State of MP 3.0
2. Rationales for MP 3.0
3. Why 3.0 ?
4. Plans for MP 3.0

# Why 3.0 ? I



About

Subcommittees ▾

Inspiring Stories

News & Highlights

FAQ

## FAQ

Replies about MP3.0 to common questions from medical physicists and the public

### General Inquiries

What is MP3.0?



What is MP1.0 and how is it different from MP3.0?



Why MP3.0 instead of MP2.0?



How is the MP3.0 Committee structured? What are its deliverables?



How is MP3.0 different than MPLA?



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# Why 3.0 ? II

What is MP1.0 and how is it different from MP3.0?



Medical physics is one of the foundational disciplines behind radiology and radiation oncology. Remember Roentgen! Medical physicists have done great things in terms of applying physics to designing technologies with superior performance; ensuring the intrinsic performance of equipment; ensuring accurate therapeutic dosimetry; and claiming compliance and accreditation. None of these are small things - they are GREAT things and we refer to them as "Medical Physics 1.0 (MP1.0)".

But what is missing? We can speak in-depth and at length about physical performance, but we shy away from talking much about clinical performance. If something is off by 5%-10%, what does that mean clinically for the patient? Where did 5%-10% come from? We do not optimize equipment; equipment comes to us with many opportunities to do so but this is not typically done. With many opportunities to change things, we have added to the variability of the operation rather than the optimization of the operation. This results in little consistency in the care that we provide from one facility to another and even from one machine to another.

MP3.0 is an extension/progression of MP1.0. MP3.0 aligns with the current aim in medicine toward high-quality, consistent, patient-centric, evidential, precise, and safe healthcare. MP3.0 shifts the focus from equipment to operation; from specification to performance; from quality checks to consistency; from presumption of utility to actual utility; and from compliance to excellence. It changes the focus from "Physics IN Medicine" to "Physics FOR Medicine" (physicists in a clinical role) or "Physics OF Medicine" (physicists in a scientific role).

## Medical Physics Progression

1.0

Equipment  
Specifications  
Quality check  
Presumption  
Compliance  
Physics *in* Medicine



3.0

Operation  
Performance  
Consistency  
Actual utility  
Excellence  
Physics *for* Medicine  
Physics *of* Medicine

MEDPHYS ● 3.0

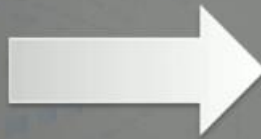


# Why 3.0 ? III

## Medical Physics Progression

### 1.0

Equipment  
Specifications  
Quality check  
Presumption  
Compliance  
Physics *in* Medicine



### 3.0

Operation  
Performance  
Consistency  
Actual utility  
Excellence  
Physics *for* Medicine  
Physics *of* Medicine

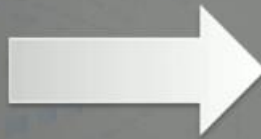
MEDPHYS ● 3.0

# Why 3.0 ? IV

## Medical Physics Progression

### 1.0

Equipment  
Specifications  
Quality check  
Presumption  
Compliance  
Physics *in* Medicine




### 3.0

Operation  
Performance  
Consistency  
Actual utility  
Excellence  
Physics *for* Medicine  
Physics *of* Medicine

MEDPHYS ● 3.0

# Why 3.0 ? V

What is MP1.0 and how is it different from MP3.0? 

Why MP3.0 instead of MP2.0? 

Medical Physics 2.0 (MP2.0) WAS an initiative, but purely focused on imaging in publications as well as dozens of presentations from 2011-2015 at RSNA and AAPM meetings. In light of this and to broaden its scope to include radiation therapy and more, MP3.0 was the logical evolution. Additionally, an ACR imaging 3.0 movement exists that we wanted to closely align with.

# Outline IV

1. Current State of MP 3.0
2. Rationales for MP 3.0
3. Why 3.0 ?
4. Plans for MP 3.0

# Plans for MP 3.0 I

## Who is MP3.0 for?



MP3.0 is for EVERYONE. For practicing medical physicists, whether established or new to the field, it is an opportunity to reflect on what we do and how we do it. In some ways it is the chance to re-imagine and re-evaluate one's daily routine as a medical physicist: Have you optimized what you are doing? How can you be more efficient - can you hand something off or stop doing something because there is no longer a reason to do it? It is easy to continue doing something because you always have or because it has always been done a certain way. MP3.0's purpose in part is for introspection: technology changes, tools change, philosophies change, regulations change; for everyone outside medical physics, it is a "peek under the hood".

# Plans for MP 3.0 II

## What is MP3.0 working on now?



MP3.0 currently has a number of projects underway including a webinar and podcast series on MP3.0 topics, creating a repository of tools and resources in an easily searchable format, and developing workshop materials. The best place to see our current action items is to check out our MP3.0 roadmap on Trello.




# Plans for MP 3.0 III

## Personal Impact of MP3.0

As a medical physicist, how do I best implement MP3.0? 

How each physicist interprets the principles of MP3.0 and decides what it means to them will be personal and unique to their situation based on areas of interests, skills/expertise, work/life balance, view of the future, needs of their clinic/community, etc.

On a higher level, some key guiding principles are:

1. Be engaged and form good working relationships with your entire department and beyond - not just other medical physicists.
2. Be generous with your time and knowledge. For example, try reaching a wider audience with simple, fun "How-To" videos.
3. Be the "scientist in the room". Maintain your curiosity/beginner's mindset. Make an impact on an area that is seen as outside "traditional" medical physics.
4. Commit to continuing education in a variety of workshops on AI, biostatistics, or quality and safety so the range of problems you are able tackle - and thus your value - expands.
5. Take initiative. Be a leader in your sphere of influence regardless of your current job title. Do so by developing leadership & management skills (see MPLA)  or test drive unfamiliar technology and procedures.

Finally, and in summary: be patient. Start small, as it may take time to find your own MP3.0 niche.

For more detailed information on MP3.0 principles, opportunities, examples, and inspirations visit the "Good practices", "Opportunities for Growth", "Inspiring Stories", and "New & Highlights" sections of this site.

# Question and Answer II

Medical Physics (MP) 3.0 is the philosophical approach to Medical Physics

- True or False

# Summary

## Medical Physics (MP) 3.0:

- is transformative (changing)
- is for benefit of patients
- is for everyone

# MP 3.0 ?



 **Thai  
Medical  
Physicist  
Society**

Edition: The 15th Annual Scientific Meeting

**ThaiMPS** Home Welcome v Important Dates Registration v Scientific v Meeting Venue Download

The 15th Annual Scientific Meeting  
of  
Thai Medical Physicist Society

***"Advanced Medical Physics Improves Patient Outcomes"***

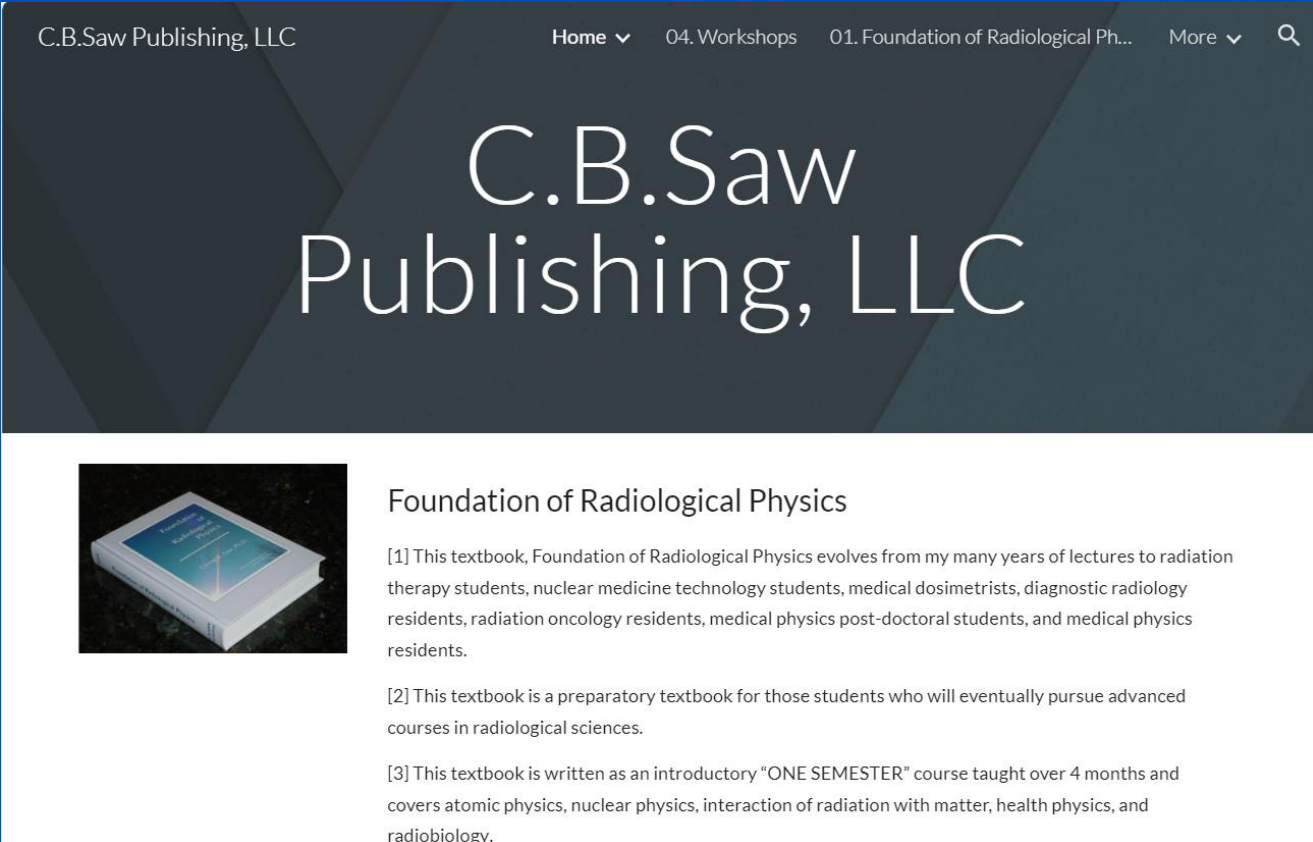
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# Last Slide


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## C.B.Saw Publishing, LLC



### Foundation of Radiological Physics

[1] This textbook, Foundation of Radiological Physics evolves from my many years of lectures to radiation therapy students, nuclear medicine technology students, medical dosimetrists, diagnostic radiology residents, radiation oncology residents, medical physics post-doctoral students, and medical physics residents.

[2] This textbook is a preparatory textbook for those students who will eventually pursue advanced courses in radiological sciences.

[3] This textbook is written as an introductory "ONE SEMESTER" course taught over 4 months and covers atomic physics, nuclear physics, interaction of radiation with matter, health physics, and radiobiology.

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