

# Challenges in Founding and Funding Medical Physics Education

**Ehsan Samei, PhD**

**Co-Founder  
Society of Directors of Academic  
Medical Physics Programs**

**Director of Graduate Studies  
Medical Physics Graduate Program  
Duke University**

# Medical Physics?

**Medicine** = Medical Physics = **Physics**

# Medical Physics?



**Medicine**

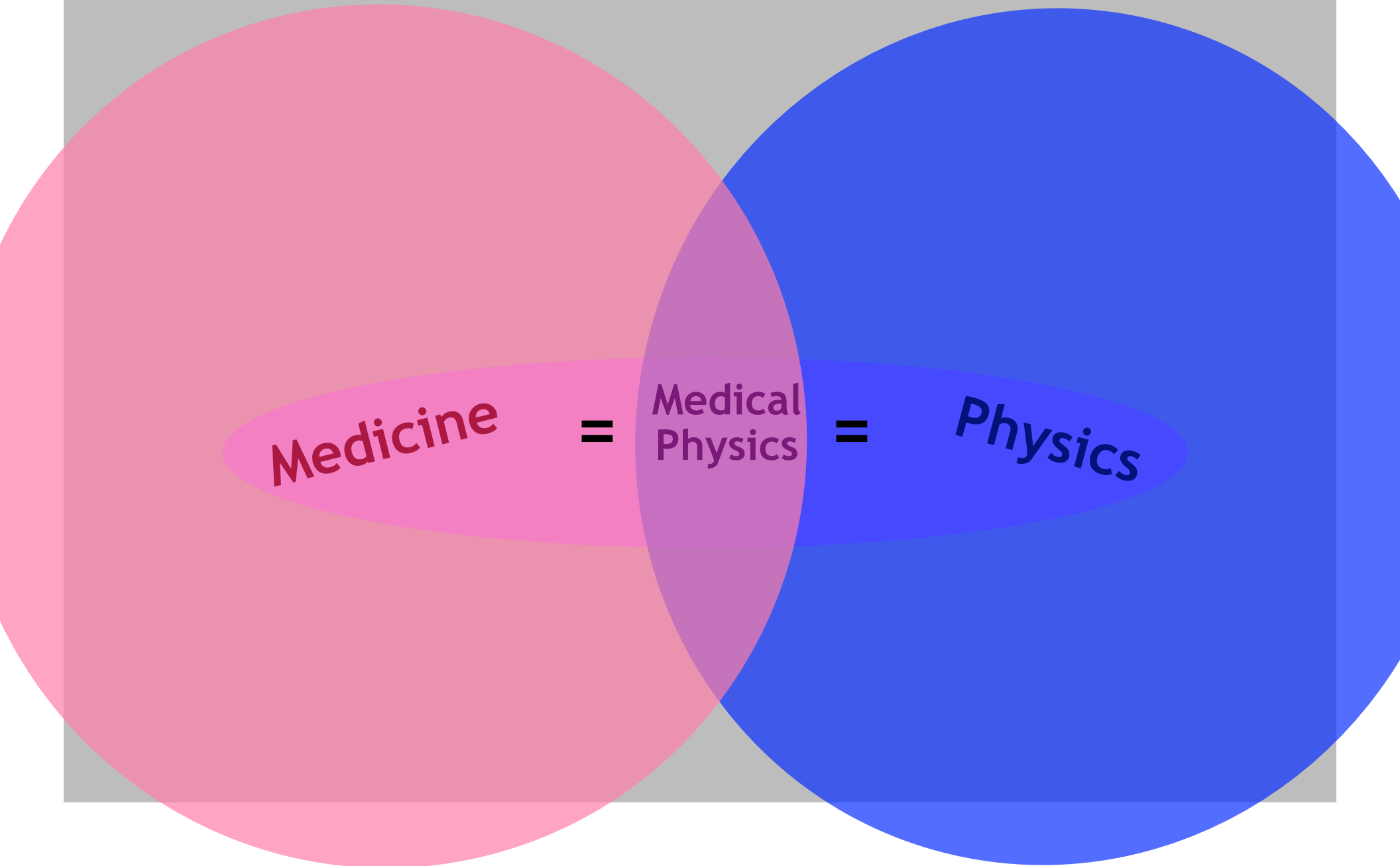
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**Medical  
Physics**

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**Physics**

# Medical Physics?



**Medicine**

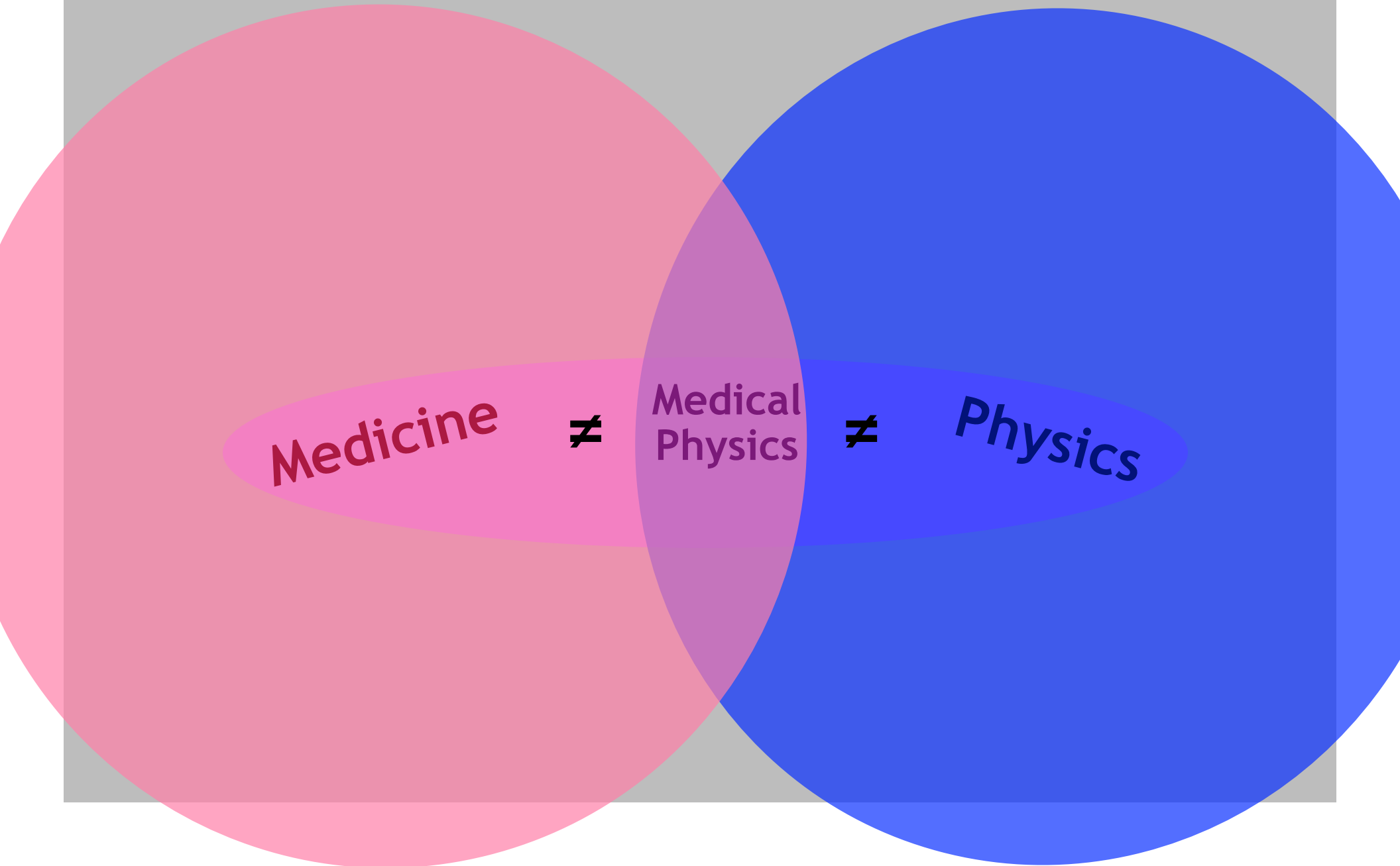
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**Medical  
Physics**

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**Physics**

# Medical Physics?



Medicine

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Medical  
Physics

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Physics

# Medical Physics?

- Interdisciplinarity *par excellence*
- No departmental identification within
  - Clinical departments
  - Basic science departments
  - University departments

# Medical Physics?

- Primary missions:
  - Clinical support
  - Research
  - Education, but...
- No educational mandate from the institution

# Medical Physics?

- Current educational programs are
  - Self-initiated
  - Variable
  - Tolerated by not encouraged
  - Lacks adequate clinical support structure
  - Little \$ to justify bandwidth needed for adequate clinical training

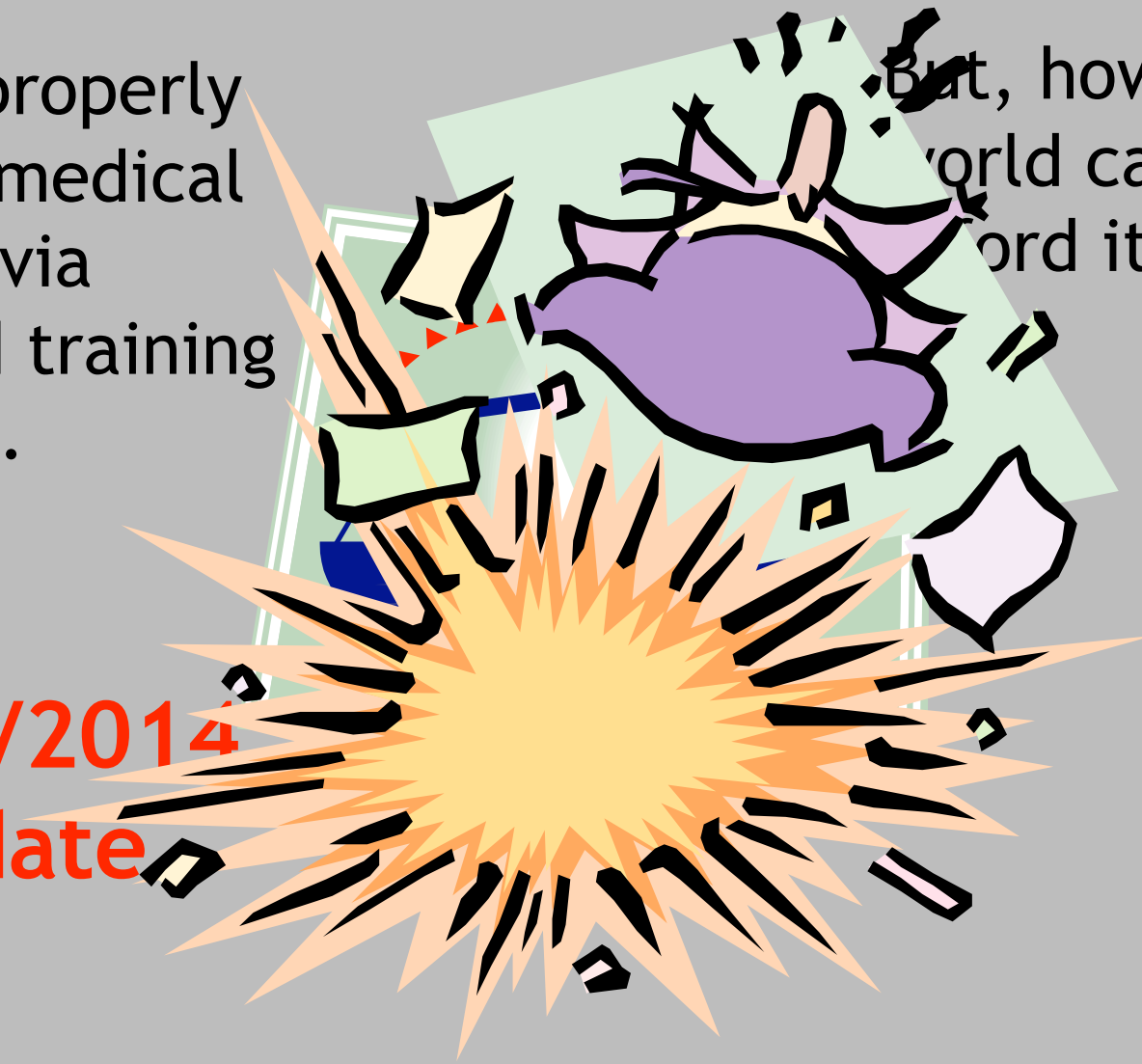


# Current State

We need properly educated medical physicists via structured training programs...

But, how in the world can we afford it?

**2012/2014  
mandate**



# Challenges of Medical Physics Education

1. Lack of ownership
2. Scarcity of bandwidth
3. Lack of money
4. Lack of clinical engagement
5. Lack of professional training
6. Rapidly changing field
7. Lack of clarity on the nature of MP
8. Mismatch with millennial generation

# 1. Lack of ownership

- Medical Physics is not defined by a standardized educational entity within the university/medical school system
- Biomedical Engineering:
  - 1<sup>st</sup> professional association: 1968
  - 1<sup>st</sup> departments in 1950s
  - 2<sup>nd</sup> wave of departments in 1960s-70s
  - Currently: ~100 departments
- Medical Physics:
  - 1<sup>st</sup> professional association: 1958
  - Currently: 2-3 departments

## 2. Scarcity of bandwidth

- Limited-bandwidth workplace
  - Clinical demands
  - New technology
  - Keeping up with the field
  - Extra-competitive research funding
- Limited recognition of the importance of education
- Training and mentoring marginalized

## 3. Lack of money

- Limited reimbursement for oncology physics services
- No “direct” reimbursement for imaging physics services
- Limited tuition reimbursement for graduate and post-graduate education

# 4. Clinical disengagement

- There is no “place” defined for medical physics students/residents in the clinical workplace
- Limited GME recognition of residencies

# 5. Professional training

- Being a medical physicist is more than knowing medical physics
- Graduates often lack an understanding of how the clinical system works and how to effectively be engaged in it.

## 6. Rapidly changing field

- Medical physics is a dynamic field
- MP education needs to keep up with the new technology and methods



## 7. Lack of clarity on the nature of the field

- Is medical physics a profession to be practiced?
  - If so: we need to impart knowledge
- Or a science to be investigated?
  - If so: we need to impart critical thinking
- Or Both?
- What is the balance?
- Wouldn't DMP divorce science from the future practice of medical physicist?

# 8. Millennial generation

- Baby-boomer: 1946-1960s
- Generation X: 1965-1980
- Generation Y: 1980-1994 millennial gen.
- Generation Z: 1994-2001
- Wikipedia: “Generation Y are labeled for being peer oriented and seeking instant gratification. The rise of Facebook, MySpace, YouTube, ... may explain Millennials' reputation.”
- Our education should recognize and adapt the generational particularities

# Challenges or opportunities?

Naming the enemy is half the victory!

## 1. Lack of ownership

- Consorted effort to develop guidelines and aid changes at universities

## 2. Scarcity of bandwidth

- Emphasize importance of education, Encourage recognition for training

## 3. Lack of money

- Provide resources in securing funding for education, ask students to pay (eg, DMP)

# Challenges or opportunities?

## 4. Lack of clinical engagement

- Encourage a cultural change in the clinical workplace

## 5. Lack of professional training

- Provide intentional professional mentoring

## 6. Rapidly changing field

- Embrace it. Educational programs should be dynamic and adaptable

# Challenges or opportunities?

## 7. Lack of clarity on the nature of MP

- Medical Physics is a practice AND a science
- Imparting knowledge AND critical thinking should be a dual goal for medical physics education

## 8. Mismatch with millennial generation

- Know your “client”