

# SDAMPP Medical Physics Education and Training Report – AAPM 2016

## Appendix 1 – Full Response Data from SDAMPP Pre-Meeting Survey

### Question 1: What is the most significant issue facing medical physics education and training right now? (47 responses)

Keeping up with continuous changes in ABR and CAMPEP requirements, many of which create narrow processes to achieve a goal or squelch individual department freedoms on how to educate/document/mentor.

employment opportunities extending into non-clinical areas (research & industry). also - the lowering of standards for new non-ABR physicists

Not enough residency spots

Excessive narrowing of focus toward clinical career education and training.

Excess of MSc and PhD graduates

The mismatch between graduate production and residency slots available.

shortage of residencies

How to provide a sufficient number of residency training spots to meet clinical demand

Funding of PhD students.

MS versus PhD

Establishing the appropriate pathway(s) toward medical physics education and certification

A lot more graduates from CAMPEP graduate degree programs than CAMPEP residency spots

Recruiting outstanding students with diverse background

The inconsistency of preparedness of graduates depending on the institution they come from. CAMPEP has a set of standards and accreditation is based on those standards, but based on the candidates I've interviewed and taken on as residents, some schools seem to not actually live up to those standards.

Funding.

Shortage of residency program positions

Uncertainty about the future of the field, the future of residency availability, and the future of ABR, CAMPEP, and regulatory requirements for board certification. All of our students are facing a world that's significantly changed from what we faced when we were training.

spending too much time trying to rectify perceived imbalances vs. improving the education of the educators

Graduate programs pumping students through with a "promise" of a "pot of gold" at the end of the rainbow. Combine that with DMP programs that decide who is worthy of getting a residency education after just completing a BS degree (see next answer). Then we have residency programs that think that they deserve to pick whoever they want (instead of letting the applicant decide).

Curriculum that prepares them for rapidly evolving practice of MP.

Lack of CMS support

ratio of medical physics graduates to residency positions

How the numbers and background of those accepted into residency programs will impact the future of the field. This applies both to the upstream issue of what happens to graduate students who do not match, as well as the downstream question of whether the role of medical physicists in advancing the field will change due to the changing pathways. On a more granular, yet related, level for those interested in clinical positions, I worry that many students entering the field do not know about the risks of not getting into a residency. Is there a way to provide more information to students early on so that they are aware of the situation and can be proactive in enhancing their chances for a match?

We lack adequate evaluation and assessment mechanisms to determine whether education and training programs are appropriately and adequately preparing the graduates to meet clinical needs. Passing ABR exams is an important but small part of ensuring that graduates are prepared to make valuable contributions to healthcare. Historically, being able to function as a "glorified technician" has been good enough but this level of skill and engagement will not sustain our profession in the future. We need rigorous feedback to validate the changes we make against the real-world situation beyond training.

The large number of candidates for positions attempting to land a clinical residency position. Also whether we are putting out enough quality candidates from grad programs to fill the needed residency positions.

DMP vs PhD and MS

attracting strong candidates to our graduate programs and funding students while in a graduate program.

Funding pressure in support of research (PHD) training

Need for solid research training but restricted by (1) clinical training requirements and (2) funding.

Funding for graduate students.

Lack of residency programs for MS degree physicists

A "logjam" into residency - lots of graduate students, limited jobs and not a lot of apparent interest in the non-residency and non-clinical career path at times - frustrated students with the expectation a residency and subsequently a position is guaranteed.

Having enough residency slots to accommodate those needed in clinical areas of medical physics.  
Providing a more streamlined process for new residency programs to obtain CAMPEP Accreditation and fully function.

Availability of medical physics residency and job positions for graduates

Not enough resident spots

I believe the 2014 training requirements are narrowing the pipeline to the field, resulting in supply/demand mismatch, which will ultimately push facilities to seek non-certified medical physics alternatives. This will diminish our role in the delivery of quality healthcare. There will be an administrative emphasis on efficiency, and training is inherently inefficient and will therefore be minimized.

Not enough residency slots (or DMP programs) to absorb the graduating graduate students and Certificate holders.

total control of AAPM and ABR - total focus on clinical career

Mismatch in the number of graduates and the number of positions available in MP.

broad and good knowledge of fundamental physics and general anatomy

1) Residency training slots for MS graduates; 2) Instilling "critical thinking" for our trainees.

Students are focused too much on clinical positions and there is so much more.

Making sure that our graduates have the resources and basic studies to succeed as medical physics... we are expanding and getting all that is required for a residency by taking a few courses with a certificate is a disservice to our program

Not enough availability of residency vacancies

Too many graduates of MS and PhD programs

bureaucracy

Mismatch

**Question 2: Are you in favor of an active effort to reduce graduate program enrollment to approach (NOT necessarily to reach) equilibrium with residency spots and/or clinical demand?**

Comments (optional):(23 responses)

We should never mandate that the number of graduate program admission positions be specifically tied to anticipated CLINICAL demand. Program graduates do not, and should not, all migrate along the clinical training to clinical career pathway. We should, instead, continue efforts to diversify graduate education opportunities. Transparency with regard to career options, however, should be an important part of graduate education mentorship.

I support reduction but I do not support reduction to reach equilibrium with clinical demand.

graduate degrees in medical physics may be applicable toward careers outside of clinical medical physics practice (e.g. industry, academia)

I don't think there is much to be done, since we exist in a free market system, but we can at least provide better information to applicants and poorly performing programs might wither because of this information.

Medical physics graduate programs are not just for clinical careers.

This is admittedly a challenge. I'm in favor of the idea in the abstract, but fearful of the many, many possible ways it could go wrong. The best interests of the students must always come first, despite the fact that there are very significant financial incentives to put other concerns ahead of the students' eventual competence and employment prospects.

Doing this will put the gate at the bachelor's level of education, and it is extremely difficult to determine who are the best potential medical physicists at that time. It also completely ignores the alternative pathway. It also happens to be the reason why I'm fundamentally opposed to the idea of a DMP (you don't get an idea to see how they perform as a graduate student before you decide they are going to pretty much get board certified (assuming the DMP program is successful in pushing them through at the minimum standard)).

Large programs with limited or no residencies are of concern

Not all graduates are interested in or suited for clinical jobs. Reducing enrollment may cause a graduate program to lose its institutional support.

This would likely need to be a decision from individual programs, not one to be mandated by an outside body. Also, we should not do anything to jeopardize the "alternative pathway" through certificate programs at the expense of ensuring more spots for CAMPEP graduates.

I am not convinced that a reduction in graduate program enrollment is needed as much as growth in residency training availability. I am strongly in favor of growth of residency training to meet clinical

demand, followed by reduction of excess graduate program enrollment after that point. I think that there is a greater need for transparency with current graduate programs regarding placement of graduates in residency programs and eventual success rates passing ABR exams and attaining certification.

Approach is the key word.

Many of our graduates go on to other types of careers - academic, industry, governmental. Tying our enrollment to residency spots and/or clinical demand could possibly limit our contributions to other aspects of our field(s).

We have reduced enrollment ourselves in response to job opportunities as our funding model for MS program allows this. Not so sure this will be viable option at many institutions with other funding models.

This sounds like it could be illegal.

Program graduates can make contributions in areas of medical physics, medical imaging, health physics, and other areas beyond those which require residency training.

(...with the understanding that there will always be some percentage of graduates who will change fields, and that there are non-clinical medical physics jobs available.) While it is true that other fields and areas of graduate study may leave the influx of students/graduates versus job availability purely to market forces, this is no reason not to strive to do better for our own students, especially in a relatively small field where students are learning a relatively specific knowledge base and skill set.

Competition is needed to have the best graduates to feed the residency program

There should be a relatively good match, but ACTIVE effort is not appropriate. Efforts should be towards reducing programs that don't provide a reasonable expectation of appropriate education and training to enter the field as certified physicist.

there are so much more opportunities out than just residencies.

This is meant to be an education and it can serve much more than clinical demand if the students are open to it.

The problem is not the medical physics graduate programs per se, but rather the side business (factory) of CAMPEP certificates that are coming out of some programs. I recognize these bring lots of money to certain programs but they need to be overseen - there seems to be no limits from certain institutions.

In conjunction with quantitative measures of quality of each programs graduates.

**Question 5: By what percentage do you feel that you could reduce enrollment in your graduate program without jeopardizing the program's viability?** (13 responses)

0

0

0%

0%

50%

20

None. We are already a small program (8 to 10 graduates per year), and are close to the break-even point in terms of cost.

Not sure. If we reduced by 50% I am sure that would affect our viability.

0%. We have already reduced enrollment in response to several issues, will not reduce further.

25% (we've shrunken to 6 PhD students a year already because of an across the board belt-tightening by our Graduate School.

Our policy is to match the enrollment with the ability to provide all appropriate training for certification and entry into the field

zero;

Who knows? We are already down 30% from our peak enrollment.

**Question 6: What would be the jeopardizing factor(s)? (finances, course offerings, etc.)** (12 responses)

finances and course offerings

finances and course offerings

Tuition revenue insufficient to support faculty. Lack of critical mass of students.

critical mass of students (we enroll 3 or 4 per year)

Finances primarily

I do not feel we need to adjust our program at all

As we are a PhD only graduate program, this would effect all aspects - funding, course offerings, slots in research labs, etc.

State accreditation and ability to fill standing courses

None at the moment.

low performance - need at least 15 graduates per two year cycles to not get on the low performance list of the public university system.

Reduction of critical mass of faculty and especially trainees - we are a small program.

No clear. We are part of a medium sized Physics Department and teaching undergraduates is a major part of the job and there enrollment goes up.

**Question 7: Do you believe that the disparity between available residency positions and medical physics graduates will have a negative effect on the medical physics graduate program applicant pool?**

(47 responses)

Comments (optional):(25 responses)

Will focus the applicants to those truly interested in clinical physics and driven to excel.

However, this is a PR problem of our own doing.

Potentially smart and engaging candidates will choose to apply their talents to other fields, given the low residency placement rate.

I believe that some future entrants (both traditional and alternative pathway) will be deterred by the low probability of obtaining a pathway to board certified clinical practice.

If the number of medical physics graduates exceeds the available residency positions for an extended time frame (e.g. ~5 to 10 years), I would expect that this would eventually lead to a reduced number of applicants to graduate programs. There's also the question as to whether the number of PhD graduates from outside of medical physics, seeking entry into the profession through alternate pathways, is further exacerbating the discrepancy.

This is a tough question. I don't think we need to match the number of spots exactly. But there should be a balance.

Most students "do their homework" when choosing a career. A 50/50 shot at getting a job is a tough sell, especially for the cost of graduate school at many of the institutions under the CAMPEP umbrella.

Or, I should say, it shouldn't. Students seeking degrees in medical physics should be made aware that there is more to the field than clinical careers.

I think that in the second year of the national match, we may already be seeing this self-correct. I hope that the result will be to discourage students who are less passionate or less well-suited for the field from applying, while encouraging the most passionate and skilled students to work harder and take advantage of all the opportunities offered them.

Eventually, graduate programs that are good at placing graduates into residency positions are going to succeed. However, DMP programs could flood the market with clinically-qualified individuals, adversely affecting the residency pathway.

As director of admissions for our program, this the number one topic that I discuss with prospective students.

I have trained outstanding medical physicists from MS programs in biomedical engineering, nuclear engineering, and health physics who will now be totally excluded. This is not affected by the residency disparity but these high-quality people are lost to us nevertheless. The bottleneck is often justified to some extent by the fact that we have too few residencies anyway. I also think that outstanding undergraduate students will perceive the risk as being too great to incur the costs of graduate education when they must compete with so many applicants for every available slot to be able to pursue a clinical career that will enable them to pay off that debt. We talk too much about non-clinical career pathways for graduates of medical physics programs, but I think we need to be honest with ourselves that students who pursue a degree in medical physics are strongly interested in clinical careers and those who take non-clinical career paths often do so more as a "consolation prize" (not always, but I would argue typically). Those who desire non-clinical careers in medical physics and closely related fields can attain the same career paths through less expensive and less risky graduate education in physics, applied physics, and various engineering disciplines, and the best and brightest will recognize that fact and do so. In the process, the top candidates who are most likely to be open to non-clinical career paths will likely self-select out of the medical physics pathway at the level of the graduate program applicant pool, never to return (given the impediments imposed by current ABR requirements for CAMPEP degrees/residency).

I admit that it could have an impact here, but again there are many other career options besides just clinical residencies. Where have our graduates gone before there were all of these residency slots? Did they all get jobs as clinical medical physicists? has that market changed since the introduction of residencies? I think we have made many contributions to other parts of our field other than clinical medical physics.

I believe it already has.

Potential students are increasingly sophisticated. A medical physics education does not make sense, compared to one in real physics or an engineering discipline, for students who have no intention of practicing clinically. They would be better off earning a degree in physics or engineering by conducting their research in a medical physics research group.



I think it depends on the program. If it is a medical physics grad program focused primarily on radiation oncology physics, potentially yes. I find that a lot of graduate students aren't committed to a clinical path at the time they start grad school - that may be more likely in some programs than others.

May reduce the number of applicants to the graduate program

Particularly for MS programs.

Eventually it would. Though it might help in equalizing graduate programs output to residency programs input, it also might reduce the quality of students who would want to enter the graduate programs in this field.

Yes, and more and more residency spots are pre-sold (to preferred graduate programs) and not available on the market

I believe a number of students are rightfully upset about this situation. Additionally, I do not believe promoting alternative career paths will help this matter. We have effectively been selling some of our students a pipe dream.

For the most part, students are aware, and more keenly so, of the unfavorable ratio for finding residency positions.

It may mean the numbers go down, but those who come will, I hope, be better motivated for doing good science instead of pursuing big bucks.

More competition ideally creates better candidates - but we are deceiving our colleagues by praising certificate holders who barely know the field.

It may but probably not immediately and probably only when the majority of medical physics graduates will not be able to find the slot. In any field there are graduates struggling to find good position.

**Question 8: Do you see the MS degree as a viable medical physics education pathway in the future?** (47 responses)

Comments (optional):(20 responses)

We have killed this degree ourselves and made the field an over inflated education system.

If more education is needed to produce a QMP than what is currently in our MS programs, why not add it to the MS curriculum? The DMP is an artificial (but maybe necessary) construct to solve the residency shortage. A QMP does not need to have a doctorate.

I think it is viable if the default is for students to pay tuition for the degree.

For clinical physicists and those in industry, the MS degree is viable.

With regard to full-time clinical positions, MS graduates already face substantial competition from PhD medical physics graduates and PhD holders from other branches of science who enter into medical physics through alternate pathways.

Most Medical Physics jobs DO NOT have a research component, so requiring a PhD does not make sense to me. The counter argument is making everyone a "doctor" with the DMP, but PhD's would still need residency, so what has actually changed? Also, many residencies are not at CAMPEP graduate schools, the logistics of filling those residencies with DMP "students" from other institutions is mind numbing and probably impossible.

Approximately half of the practicing physicists in the field are at the MS level. There is no way that the field can support an all-PhD Physics workforce. I am a faculty physicist, and I am very glad that we have a large number of MS-level staff physicists at our facility, whose only job is clinical service. If we were all faculty, all scrambling for research and teaching time, all competing for the best students, etc, the faculty track would be even more difficult.

It all depends on how the DMP evolves (I'm opposed as you can see by my comments).

For special circumstances, e.g. active duty military and pathway to PhD

Most, if not all, of the clinical responsibilities can be fulfilled by master degree holders

I think that the most recent match showed that the acceptance rates of PhDs and MS degree candidates were similar. I think there are lots of opportunities for MS students.

Viable for what? It is certainly viable from an instructional perspective. It makes a lot of sense for people who desire clinical careers rather than scholarly careers not to devote several years to PhD-level research. However, there is strong and vocal prejudice against MS physicists in some circles of the AAPM, so it has that going against it.

I think it should be, but I fear it is being eliminated due to high competition levels for residency.

It is my opinion that MS plus residency or DMP provides excellent preparation for 70% of the clinical jobs in the field. However, we have structured the pipeline such that MS students are at a significant disadvantage. Under the current paradigm I would recommend against students entering an MS only program.

Really there is no compelling reason to maintain MS programs.

you do not need a research PhD to do routine clinical work - only if you are at a university hospital in a non-clinical position

I believe we are continuing to make it more challenging for students to become ABR eligible with an MS.

The MS may be viable for industry and certain service realms, however, the number of PhD holders is significantly greater, such that MS holders may struggle to favorably compete.

It never was in Canada outside of Quebec. The operative word is 'education'. I note that the word 'training' wasn't used here.

My answer is N/A. I am not sure what MS degree means.

**Question 9: Do you see the DMP as an improvement in the MP education and training system?**

Please state why or why not: (39 responses)

DMP just muddies the waters for administration. There is no true difference between DMP and MS+residency except in one the student pays and the other the program pays.

i see absolutely no value or reason to willfully differentiate a PhD medical physicist. A DMP lacks the research experience that I expect from a Doctoral degree.

Not all sites have graduate programs, we need MS + Residency as an option, there are positives to do a residency at a different place from graduate school

Unless the DMP equates to more than a didactic MS degree coupled with a conventional 2-year residency, this model is not an improvement with regard to an education and training model. It is merely an equivalent education/training model with a doctorate "credential".

Professional recognition in the clinical environment and financial viability

The DMP projects do not seem to have the rigor of a traditional MS thesis. The ability to carry out clinical research is a key component for any clinical physicist; (having an 'easier' project which competes for dedicated time with clinical training does not benefit the long-term clinical research abilities expected of all clinically practicing physicists). MS --> Residency.

I believe it will have a positive and negative impact. However, I believe the positive impact of helping resolve the shortage of residency spots outweighs the cost to the students and the degree inflation and confusion it creates.

I think it is an acceptable offering, but I don't see how it would create better medical physicists than an MS plus a residency. I don't know much about the programs or their graduates, though, and could be wrong about this.

The same thing can be accomplished with DMP and a master's degree with a residency, with less of a financial burden on the student

For those students who decide upon a medical physics career early, the DMP eliminates the need for a residency. However, funding for DMP programs (outside of tuition) may be difficult.

Current CAMPEP PhD graduates can do all DMP graduates do, but DMP can not do all PhD graduate do in ~20% academic institution job sector, where research is a vital part of job.

A DMP is an MS who paid more to get there professionally. DMP is NOT recognized as a terminal degree, so it doesn't open extra doors, it just costs more money and the graduate gets to call themselves doctor. They will fill the exact same jobs and have the exact same training.

Is this just taking what already exists and calling it something different?

We already have a terminal doctoral degree in physics. Creating 'PhD-lite' does nothing for the field, and undermines the value of the PhD to some extent. We'd be far better off, in my opinion, promoting the Masters degree as a legitimate professional degree.

it is just an MS and a residency - it is the same thing as the MS pathway, oh except you pay your way through.

I think it's possible that a DMP is better than an MS followed by a residency (and those programs have made that claim). However, that does not mean that the best individuals are going to get into that pathway. The fact that students are not paid as much may also mean that the market for clinical physicists will get flooded by DMP graduates, with unemployment for either DMP or residency graduates.

It is a natural evolutionary adaptation.

Yes if the students are supported financially

I think it would only be an improvement if it took the place of the MS degree

It is essentially the same content as an MS program and a residency, it is simply restructured to shift the cost of residency training from the clinical training center to the trainee. This makes life easier for the universities and hospitals, so it may serve the goal of increasing clinical training opportunities, but it imposes a large burden on the trainee. I think that if the DMP is truly the training structure of choice, then all residencies should be absorbed into DMP programs; on the other hand, if residencies are the way to go, then residencies should be supported and residents should be paid. It is not fair for DMP students and residents to work side by side, one paying and the other being paid.

There are a lot of pluses and minuses. Ultimately the paying for access to residency training feels wrong and tips the scales for me.

Not sure yet. Not sure how the financial models are working out yet.

DMP doesn't address the fundamental issue: MS graduates who do not obtain residency or cannot find a permanent position are not prepared for many other careers. DMPs won't be any different, except they will have spent twice as much in tuition and fees.

(1) Funding from students; (2) Doctoral degree.

Improvement: The DMP approach assures the student of clinical experience (provided he makes satisfactory academic progress), which removes the anxiety and uncertainty of the residency process.

Detriment: As many programs are implemented, a relatively naive college student must decide before matriculation into the DMP whether to pursue therapy or imaging. Ideally, a broad education in the gamut of medical physics would prepare a student to choose a specialty after a year or two of exposure to the field. Alas, that does not seem to be how things are working in the implementation or planning of the DMPs of which I am aware.

This is just an alternate method to replace MS plus residency.

Circa 2009-2010, one of the concerns among MS students/graduates was that the DMP would supplant MS degrees if they were widely offered, and that graduates with DMP degrees would be preferentially hired and edge MS graduates out of the marketplace. I'm not certain if this is still a concern, particularly since there are not many DMP options currently available. However, especially now that residency is required for certification, is it really ethical to guarantee a residency at the cost of an additional 2 years' worth of graduate tuition (and likely loan debt) when other trainees in the field are instead being compensated for doing the same work and receiving the same training?

graduate program plus residency has been demonstrated to be a working model

Combining the didactic and clinical experience in a single program provides for a more seamless and efficient method of training.

It is the most efficient way to train "clinical" medical physicists. It removes the cost burden from the programs. It puts emphasis on the professional aspects of the field. Could help to offset the cost of maintaining a "academic" doctoral programs (PhD).

need "big" residency program; heavy financial burden for students - unethical not to pay residents

This still appears to be an MS+guaranteed residency, with the trainee paying for their residency. I think we need to consider other ways to help support the ABR pathway for MS candidates, those that are really just interested in a clinical position.

usually physicists with traditional physics education has better understanding of physics and they have higher thinking skills

The DMP helps for those individuals pursuing the MS degree by guaranteeing a residency position. However, there are a small number of these programs available (they may be growing). Also, the DMP provides confusion relative to the meaning of both the MS as well as PhD degrees. A potential re-naming for the DMP is "Medical Physics Practitioner", which may provide clarity for the "doctoral" degree.

(a) it shifts costs to the student which means those in it really are looking at it as the key to big bucks (b) it reduces the role of research in the student's education (c) it reduces the cohort of young scientists available for research

It is a watered down doctorate. An MS in medical physics or a PHD for those pursuing academic career is fine. Don't muck it up with this low bar that is not quite either degree.

Yes but it will take many years if not decades to convert fully to DMP.

My answer is N/A. Please specify improvement: improvement over what?

They are not doctors

**Question 10: What do you think is the right number of CAMPEP-accredited clinical training slots needed PER YEAR to meet clinical demand in Radiation Therapy (this includes both clinical residency and DMP spots)?** (43 responses)

150

150

150

I don't know.

I don't know.

I don't know.

120

120

120

130

130

140

140

Not sure

Not sure

Difficult to say; perhaps equivalent to the number of available clinical positions; but this would vary based on technology and changes in staffing models including Medical Physics Assistants and adaptive planning.

no idea

not sure

2 per year

Not sure. Would like to see some statistics.

Educated guess is the average number of new clinical positions available per year (over last 3 years) multiplied by 1.2.

Enough to meet the anticipated number of job openings

Although I don't have information on the total number of job openings and residency slots nationwide, I would recommend that the number of residency slots not be increased from its current level at this time (our residency graduates do find employment within one year after graduation, but it is challenging for them).

close to 85% of total unique positions posted by AAPM

80

Without the benefit of job market data, my guess is around 150

125

Yes

The number of clinical training spots should match the number of job openings

Probably slightly more than we have now but I have no data to support this.

It should be reasonably proportional to the number of job positions. Can we turn to the experience in radiation oncology residencies for insight? I wouldn't know the right number without looking into job market data first

I don't know

80-100

Our research indicates that about 3% of medical physicists retire each year, so something on the order of 150-180.

Can't comment.

Do not know.

75% of the number of graduates

125-150

difficult to say

Unsure, we need a workforce study to evaluate.

no answer

Here the word training was used and I think what we really need is education. Don't know the equilibrium numbers.

There is no good answer. This will vary depending on demand for Medical Physicists.

**Question 11: What do you think is the right number of CAMPEP-accredited clinical training slots needed PER YEAR to meet clinical demand in Imaging (this includes both clinical residency and DMP spots)?** (39 responses)

25

25

25

I don't know.

I don't know.

10

10

Same as above.

no idea

n/a

30

Don't know

Not sure.

65

Educated guess is the average number of new clinical positions available per year (over last 3 years) multiplied by 1.2.

Enough to meet the anticipated number of job openings

may be 30-45, should be close to 85% of aapm posted annually



20

No idea

Probably not

Same as above

I wouldn't know the right number without looking into job market data first

I don't know

10-20

Not sure

Our research indicates that about 3% of medical physicists retire each year, so something on the order of 50-75.

Can't comment.

Do not know

Much more than currently available.

40-60

more what we have

Unsure, we need a workforce study to evaluate.

no answer

Don't know.

Not sure... 40?

Double what is present available

35

I don't know. I am not in Imaging field.

40