The Abt study of Medical Physicist Work Values for Radiation Oncology Physics Services: Round III – Negotiate wisely and avoid greed – Michael D. Mills

Abt-III? What (who) is that?

- Abt Associates, Inc. is one of the nation's most respected medical economics consulting organizations – after all look at the client list: AAPM and ACMP!
- The Abt-III study measured medical physicist work for both routine and special procedures

Wait a minute – was there an Abt-I study? An Abt II?

- Sure, the AAPM and ACMP did this back in 1995 and again in 2002, but:
- They are out of date
- They did not measure certain procedures such as IGRT and HDR
- The 2002 study was performed before IMRT was widespread and in common use
- Stereotactic Body Radiation Therapy? Forget it!

OK, Tell me about Abt-III

- We started back in 2007
- AAPM agreed to fund another work study with Abt Associates and foot the entire cost!
- AAPM pays $95,000
- This time we measured work associated with IGRT, Stereotactic Body, HDR and other special procedures

What were the steps to the Abt-III survey?

- 1 – Establish the Preliminary Panel
- 2 – Survey Qualified Medical Physicists
- 3 – Convene an Expert Panel to review data
- 4 – Abt staffer Kevin Coleman wrote final report
- 5 – The Expert Panel reviewed the report
- 6 – Abt delivered the final report to AAPM

Who was on the Preliminary Panel?

- AAPM –
  - Michael Mills
  - Michael Herman
  - Herbert Mower
  - James Hevezi

And Who from Abt Associates?

- David Kidder
- Lois Olinger
- Kevin Coleman

What did the Preliminary Panel Do?

- Defined the scope of codes associated with medical physicist work
- Selected appropriate benchmark procedure (77336 – Continuing Medical Physics Consultation)
- Developed survey codes' vignettes
- Refined the survey instrument

How did the survey measure Qualified Medical Physicist work?

- Collected time estimates (non-procedural and procedural) associated with providing medical physics services
- Collected intensity estimates for each service relative to the baseline service
- Collected service-mix data (annual number of each procedure provided by a practice)
- Analyzed survey data to develop preliminary QMP work estimates by service

Who received the survey instrument?

- 100 QMPs were chosen, all members from the AAPM
- Members were chosen based on data from the most recent AAPM Professional Survey
- Members were selected to reflect the same practice type and geographic location percentages as found in the AAPM population as reported in the Professional Information Survey

OK, who were the members of the Expert Panel?

- AAPM
  - Michael Mills
  - Ned Sternick
  - Jim Hevezi
  - Herbert Mower
  - Rene Smith
  - Michael Herman
  - James Goodwin

And what did the Expert Panel Do?

- Examined the intensity, non-procedural, and procedural survey time data
- Validated the time, intensity and work estimates for clinical face validity
- Performed a rigorous clinical review of preliminary QMP work estimates
- Reviewed the final report for accuracy of reported information and validity of the conclusions

Where were the steps to complete in the process?

- The survey was completed
- The Expert Panel met and validated the survey results
- The report was released for the Expert Panel to review
- The Expert Panel met by conference call to approve the draft report
- The final report was submitted to the AAPM Board of Directors on April 30, 2008
- The report is being provided in .pdf format for easy distribution to the medical physics community on the AAPM website

How can we be sure the survey is valid?

- Survey responses were tested for
  - practice type (private/community hospital, medical school university hospital, physician group, medical physics group)
  - Census region and state (compared to the AAPM salary survey)
- The respondents were not statistically different from the AAPM salary survey

What is procedural time and what is non-procedural time?

- Procedural time is that spent with a specific patient, performing a service for that patient (including the time to bill the patient)
- Non-procedural time is that spent with equipment – commissioning, daily and monthly checks, annuals, recommissionings after repair, etc.

Start with median non-procedural time – how do you measure it?

77295, 77300, 77301, 77305, 77310, 77315, 77321 median time	**Hours**
Initial Commissioning (annualized over 5 years; raw value was 492 hours)	98.4
Recalibrations (annualized over 5 years)	20
Annual Calibrations	45
Daily, Weekly, Monthly Checks	144
Total Commissioning Time	308.3

More median non-procedural time

Annual Hours Reported	77326, 27,28 77781, 2, 3, 4	77331	77332	77333	77334
Initial Commiss.	9	7.5			1.4
Monthly Checks	40	45			36
Total non-procedural Time	79	53.2	2	2.5	40.4

QMP Time (table 1)

CPT	Procedure	Non P	Proc	Total
77295	Simulation 3-D	0.25	0.73	1.18
77300	Bas Dos Calc	0.25	0.25	0.55
77301	IMRT Tx Plan	0.25	4.00	4.53
77305	S Isodose	0.25	0.33	0.69
77310	I Isodose	0.25	0.50	0.78
77315	C Isodose	0.25	0.50	0.98
77321	Tele Port Plan	0.25	0.60	1.07

QMP Time (table 2)

CPT	Procedure	Non P	Proc	Total
77326	S Br Isodose	0.90	1.00	2.52
77327	I Br Isodose	0.90	1.75	2.70
77328	C Br Isodose	0.90	3.00	4.78
77331	Sp Dosimetry	0.35	1.00	2.06
77332	S Tx Device	0.02	0.00	0.13
77333	I Tx Device	0.05	0.25	0.34
77334	C Tx Device	0.02	0.17	0.24

QMP Time (table 3)

CPT	Procedure	Non P	Proc	Total
77336	Continuing MP Consultation	N/A	1.00	1.00
77370	Special MP Consultation	N/A	3.45	3.45
77781	HDR 1-4	0.90	1.50	2.70
77782	HDR 5-8	0.90	2.50	3.79
77783	HDR –12	0.90	3.25	4.70
77784	HDR >12	0.90	2.50	3.43

Median support staff time estimates in hours by CPT code

77295	2.75	77331	0.63
77300	0.5	77332	0.50
77301	4.25	77333	0.50
77305	1.00	77334	1.00
77310	1.50	77336	N/A
77315	2.00	77370	N/A
77321	2.00	77781	0.50
77326	1.00	77782	0.88
77327	1.67	77783	1.00
77328	2.00	77784	1.13

How does the 2007 Abt-3 time data compare to the 2002 Abt-2 and the 1995 Abt-1 data?

- Commissioning times are reported to be a little shorter in 2007 compared with 2002, possible reflecting greater familiarity with IMRT commissioning
- Procedural times are a little shorter for IMRT procedures, a little longer for brachytherapy procedures, but not significantly different
- Special MP Consultation time was 4.00 hours in 1995, 5.6 hours in 2003, and 3.45 in 2007

Once we have time, how do we measure work?

- Work = time X intensity
- We select a common representative procedure and use it as a benchmark with intensity = 1.0
- The preliminary panel selected 77336 as our benchmark and assigned it an intensity of 1.0
- Respondents assigned all other procedures an intensity using 77336 as a reverence

QMP Work (table 1)

CPT	Procedure	Time	Inten.	Work
77295	Simulation 3-D	1.18	2.00	1.63
77300	Bas Dos Calc	0.55	1.00	0.49
77301	IMRT Tx Plan	4.53	6.00	28.66
77305	S Isodose	0.69	1.00	0.69
77310	I Isodose	0.78	1.28	0.83
77315	C Isodose	0.98	1.50	1.65
77321	Tele Port Plan	1.07	1.50	1.64

QMP Work (table 2)

CPT	Procedure	Time	Inten.	Work
77326	S Br Isodose	2.52	2.00	3.88
77327	I Br Isodose	2.70	2.00	5.64
77328	C Br Isodose	4.78	3.00	11.98
77331	Sp Dosimetry	2.06	1.65	2.66
77332	S Tx Device	0.13	0.70	0.12
77333	I Tx Device	0.34	1.00	0.30
77334	C Tx Device	0.24	1.00	0.45

QMP Work (table 3)

CPT	Procedure	Time	Inten.	Work
77336	Continuing MP Consultation	1.00	1.00	1.00
77370	Special MP Consultation	3.45	3.38	13.94
77781	HDR 1-4	2.70	2.0	5.7
77782	HDR 5-8	3.79	2.5	10.3
77783	HDR 9-12	4.79	3.0	14.7
77784	HDR >12	3.43	3.0	13.9

QMP Work Abt 1,2 &3 (table 1)

CPT	Procedure	1995	2002	2007
77295	Simulation 3-D	1.18	2.00	1.63
77300	Bas Dos Calc	0.33	0.29	0.49
77301	IMRT Tx Plan	N/A	18.64	28.66
77305	S Isodose	0.75	0.54	0.69
77310	I Isodose	1.24	0.72	0.83
77315	C Isodose	1.69	1.30	1.65
77321	Tele Port Plan	1.81	1.52	1.64

QMP Work Abt 1,2 &3 (table 2)

CPT	Procedure	1995	2002	2007
77326	S Br Isodose	3.18	1.87	3.88
77327	I Br Isodose	4.73	3.53	5.64
77328	C Br Isodose	11.67	8.67	11.98
77331	Sp Dosimetry	4.35	3.60	2.66
77332	S Tx Device	0.06	0.11	0.12
77333	I Tx Device	0.31	0.42	0.30
77334	C Tx Device	0.39	0.40	0.45

QMP Work Abt 1,2 & 3 (table 3)

CPT	Procedure	1995	2002	2007
77336	Continuing MP Consultation	1.50	1.50	1.00
77370	Special MP Consultation	15.00	20.92	13.94
77781	HDR 1-4	N / A	N / A	5.72
77782	HDR 5-8	N / A	N / A	10.34
77783	HDR 9-12	N / A	N / A	14.67
77784	HDR >12	N / A	N / A	13.85

OK, how does MP work in 2007 compare to 2002 and 1995?

- Across the board, the work values are similar to those in 1995 and 2003
- – 77370, Special MP Consultation increased in value from 15.00 to 20.92, then decreased to 13.94
- – 77336 , Decreased from1.50 in 1995 and 2002 to 1.0 in 2007

What is the meaning of the time value of 60 minutes for 77336?

- Fluxuations of this magnitude are common in this type of survey; the work probably has not changed that much.
- The AMA Practice Expense Advisory Committee (PEAC) survey measures 77336:
  - 6 minutes of medical physicist time
  - 26 minutes of combined medical physicist / dosimetrist time (at 50% each)

What are the components of 77336 according to ACR/ASTRO?

- Weekly chart reviews
- Review and analysis of medical physics treatment changes
- Consult on patient setup / treatment changes
- Verification of dose calculation data
- Reviewing accuracy of current data record
- Review of patient specific therapist treatment and technical notes
- Patient radiation safety

What are the components of 77336 according to Abt III

- Reviewing the patient case in initial presentation, simulation, planning & treatment
- Performing weekly chart check of all charting, diagnostic studies, port films, and patient calculations
- Reviewing charts with other members of the patient management team in chart rounds
- Viewing patient positioning & machine set-up
- Researching treatment scheme (assuming a special medical radiation physics consultation (CPT 77370) is not billed
- Performing final chart check and validation

Some activities not always associated with 77336

- Correcting problems and process issues with the record and verify system for individual patients
- Planning and treatment approval before the first treatment fraction
- Investigating why shifts from expected to clinical isocenter are larger than expected.
- Medical physicists presence for HDR, stereotactic treatments, respiratory gating, etc.
- Clearly a there is a potential for a lot of 77336 work to be overlooked by administrators or physicians as they fill out the PEAC questionnaire.

Besides work, what else did you measure?

- We measured the acceptance of new technologies in the marketplace
- We measured the time required to perform some patient specific special procedures
- We measured staffing by practice type, not just for medical physicists, but for all professionals working in radiation oncology

OK, What about new technology acceptance?

Total Skin Irradiation	34%
Total Body Irradiation	37%
Remote Afterloading Brachy	68%
Stereotactic Radiotherapy	61%
Stereotactic Body Irradiation	39%
Stereotactic Radiosurgery	68%
Intraoperative Radiotherapy	17%
Prostate Seed Brachytherapy	78%
IMRT	95%
IGRT	78%

And what about the acceptance of new external beam features?

Record and Verify System	95
Dynamic Wedge	59
Multileaf collimator	95
Electronic Portal Imaging	80
Multileaf Collimator based IMRT	88
Respiratory Gating System	39

OK, show me some 77370 median special procedure times in hours

Total Skin Irradiation	8.5
Total Body Irradiation	9.5
Remote Afterloading Brachy	2.0
Stereotactic Body Therapy	4.0
Stereotactic Radiosurgery	6.0
Stereotactic Radiotherapy	3.5

More median special physics consultation times in hours

Routine 77370 Procedure	2.0
Intraoperative Radiotherapy	4.0
Prostate Seed Brachy	4.0
IMRT	4.0
IGRT	1.0

Show me median staffing results for medical physicists by patient load

Practice Type	**# Patients per QMP**
Private Community Hosp.	368
Med School Univ. Hosp.	220
MP Consult. Group	464
Physicians Group	260
Overall	304

OK, how about median overall staffing information?

# Patients treated per year	**595**
# Qualified Medical Physicists	2.0
# Radiation Oncologists	3.0
# Dosimetrists or Junior Medical Physicists	3.0
# Maintenance Engineers	0.0
# Radiation Therapists	8.0
# Radiation Oncology Nurses	3.0

What is the median number of physics services by CPT code?

77295	300	77331	114
77300	2,495	77332	57
77301	150	77333	13
77305	25	77334	2,200
77310	10	77336	2,495
77315	299	77370	142
77321	73	77781	20
77326	5	77782	13
77327	2	77783	42
77328	45	77784	78

And what is the median number of services provided per QMP?

77295	115	77331	18
77300	1,030	77332	24
77301	61	77333	4
77305	9	77334	810
77310	3	77336	1,024
77315	103	77370	50
77321	23	77781	0.0
77326	1	77782	0.1
77327	1	77783	0.8
77328	14	77784	1.7

How can we use this data?

- We use it to defend staffing levels
- We use it to defend QMP work effort
- We also use it to defend patient charges
- Physicians use a similar survey-based study to defend reimbursement amounts from CMS
- However, instead of relying on accountants, economists, and lobbyists, we have to learn to use this information ourselves to negotiate compensation and staffing

What steps to I follow to defend staffing levels?

- Measure your patient load in new patients per year
- Determine the median caseload for your practice type
- Determine the median staffing levels for that practice type
- Calculate your institutional staffing based on your patient load

What are the median patient volumes by practice type?

Abt 2007 Data

Practice Type	# of Total Patients Treated	# Patients Per QMP
Private Hospital	591	368
Med. Sch. Hosp.	999	220
Med. Phys. Consult. Grp.	382	464
Physicians Group	415	260
Overall	595	304

What were median staffing patterns normalized to 800 Patients/Year?

Abt 2007 Data

Practice Type	Medical Physicists	Radiation Oncologists	Dosime-trists
Private Hospital	2.4	3.4	4.1
Med. Sch. Hosp.	4.6	4.5	2.6
Med. Phys. Consult. Grp.	4.2	4.2	4.8
Physicians Group	2.9	3.9	2.5
Overall	2.7	4.0	4.0

How do I defend the effort to provide physics services at my institution?

- Determine the number and type of physics services your institution provides annually
- Use the median service mix and the median times per procedure in the 2007 Abt report to calculate the median procedure-hours provided by a medical physicist
- Use this information to show the service-hours provided by your program with reference to a national median standard

Time & Work measured to provide the median QMP Abt 2007 service mix

Abt 2007 Data - Median Patient Load 304/Year

CPT Code	Med. # / 304 Patients Per Year	Medical Physicist Time (Ann.)	QMP Work (Ann.)
77295	123	145	200
77300	1030	567	505
77301	61	276	1,748
77305	9	6	6
77310	3	2	3
77315	103	101	170
77321	23	25	38
77326	1	3	4
77327	1	3	6
77328	14	67	168
77331	18	35	48
77332	24	3	3
77333	4	1	1
77334	810	194	365
77336	1,023	1,023	1,023
77370	123	242	1,715
	Total Time	2,693 Total Work	6,003

Wait a minute – are you saying we should work 2700 hours/year!?

- No! – It is well known that time estimations in absolute hours by individuals performing services overestimate that time by approximately 30 - 50%
- It is equally well known that systems engineers with stopwatches underestimate service times by up to 30 - 50%
- The usefulness of this data is it gives medical physicists a national work benchmark standard.

2700 hours for 1 QMP responsible for 304 patients/year? 6000 Work units? What does this mean?

- The median FTE medical physicist provides services for approximately 304 patients per year
- The median time to provide the median service mix for 304 patients is ~ 2,700 hours
- The median number of work units Is ~ 6000
- For your institutional service mix, calculate the QMP hours required to provide the physics services and calculate the QMP work units
- Divide the QMP hours by 2,700 to defend QMP FTE staffing and the number of QMP work units by 6,000 to defend QMP work.

What is the difference between defending staffing and work?

- Staffing applies to the entire medical physics program, work applies only to the QMP
- Staffing may include non-professional effort, QMP work is professional in nature
- For professionals, work is directly related to compensation with respect to services provided, staffing is not

How do I use the Abt study to defend QMP salaries?

- Center for Medicare and Medicaid Services (CMS) fee schedules are published and are public knowledge
- Percentage of CMS patients varies among institutions
- Typically, 1/3 of all radiation oncology patients are CMS
- If so, CMS patients will account for approximately 1/5 of total patient revenue

How can I use the Abt 2007 data to establish patient fees?

- Calculate fixed costs for the procedure including medical physicist and dosimetrist compensation based on time and equipment depreciation
- Calculate variable costs (from accounting)
- Calculate indirect costs (from accounting)
- Total the direct (fixed and variable) costs and indirect costs
- Add 10% allowed revenue per procedure
- Sum total costs and revenue to show a charge for the procedure

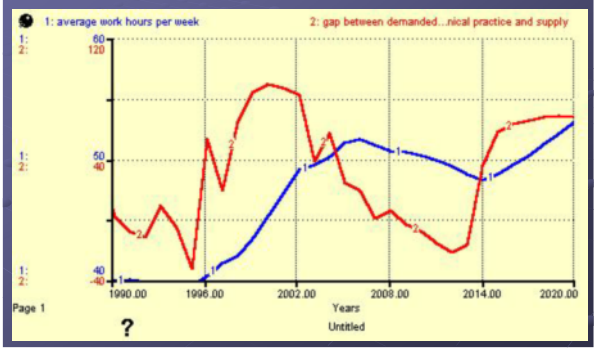
So, what is the bottom line?

- The Abt 2007 survey establishes the work performed by the qualified radiation oncology physicist
- CMS has a history of accepting independent surveys from Abt, Inc.
- The Abt 2007 survey allows the QMP to defend staffing, quantity of work and compensation

How should we view our compensation for professional services in 2008?

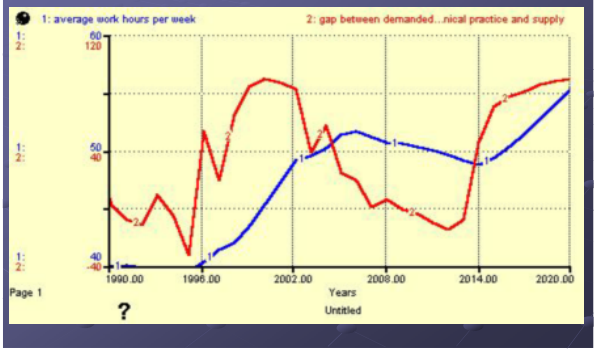
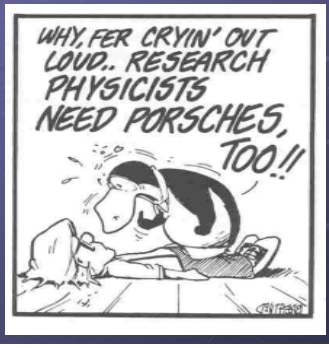
- The Abt Associates report empowers the medical physicist to negotiate from a middle ground for compensation - between direct billing and a non-professional salary
- Both QMPs and physicians use work studies to justify compensation
- The difference is that physicians negotiate with HCFA for their profession while QMPs negotiate with providers, individually
- What we really need is the experience, patience and wisdom to negotiate a equitable compensation

What about 2014 – 2020?
If we have 125 CAMPEP slots



What about 2014 – 2020?
If we have 200 CAMPEP slots

What about 2014 – 2020?
If we have 100 CAMPEP slots



How about both research and clinical physicists!?