Analysis and Practical Use

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

Abt-2? 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-2 study measures medical physicist work for both routine and special procedures
- How? Thought you would never ask!

Wait a minute – was there an Abt-1 study?

- Sure, the AAPM and ACMP did it back in 1995, but:
- It is out of date
- It did not measure special procedure work
- It was performed at a time before 3-D treatment planning was common practice
- IMRT? Prostate Brachy? Forget it!

OK, Tell me about Abt-2

- We started back in 2001
- AAPM and ACMP agreed to fund another work study with Abt Associates
- AAPM pays $50,000
- ACMP pays $26,000
- This time we measured work associated with IMRT and other special procedures

What were the steps to the Abt-2 survey?

- 1 – Established Preliminary Panel
- 2 – Surveyed Qualified Medical Physicists
- 3 – Convened Expert Panel to review data
- 4 – Abt wrote final report
- 5 – The Expert Panel reviewed the report
- 6 – Abt delivered the final report to AAPM and ACMP

Who was on the Preliminary Panel?

- AAPM –
  - Michael Mills
  - Ned Sternick
- ACMP –
  - Herbert Mower
  - Rene Smith

And Who from Abt Associates?

- David Kidder
- Lois Olinger
- Kevin Coleman

What did the Preliminary Panel Do?

- Established time periods defining 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 procedures provided by service)
- Analyzed survey data to develop preliminary QMP work estimates by service

Who received the survey instrument?

- 100 QMPs were chosen, 50 members from the ACMP and 50 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
  - Michael Gillin
- ACMP
  - Herbert Mower
  - Rene Smith
  - Michael Herman
  - Kenneth Hogstrom

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 approved by the AAPM and ACMP governing Boards in 2003
- The report was provided in .pdf format for easy distribution to the medical physics community

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, except that we had a low response rate from the Mid-Atlantic States (NY, NJ, PA)
- Controlling for this low regional response did not make any significant change in the results

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)	120
Recalibrations (annualized over 5 years)	29
Annual Calibrations	48
Daily, Weekly, Monthly Checks	225
Total Commissioning Time	455

More median non-procedural time

Annual Hours Reported	77326 77327 77328	77331	77332	77333	77334
Initial Commiss.	16	7.6			2
Monthly Checks	25	48			36
Total non-procedural Time	47	52.2	2	3	36.2

QMP Time (table 1)

CPT	Procedure	Non P	Proc	Total
77295	Simulation 3-D	0.15	1.00	1.16
77300	Bas Dos Calc	0.15	0.25	0.56
77301	IMRT Tx Plan	0.15	5.25	5.53
77305	S Isodose	0.15	0.30	0.54
77310	I Isodose	0.15	0.50	0.63
77315	C Isodose	0.15	0.50	0.83
77321	Tele Port Plan	0.15	0.75	1.06

QMP Time (table 2)

CPT	Procedure	Non P	Proc	Total
77326	S Br Isodose	0.38	0.75	1.20
77327	I Br Isodose	0.38	1.00	1.90
77328	C Br Isodose	0.38	2.50	3.18
77331	Sp Dosimetry	0.57	1.00	1.61
77332	S Tx Device	0.02	0.1	0.17
77333	I Tx Device	0.06	0.25	0.36
77334	C Tx Device	0.02	0.25	0.30

QMP Time (table 3)

CPT	Procedure	Non P	Proc	Total
77336	Continuing MP Consultation	N/A	1.50	1.50
77370	Special MP Consultation	N/A	5.60	5.60
773xx	IMRT Special MP Consultation	N/A	6.00	6.00

Median support staff time estimates in hours by CPT code

77295	3.75		77327	1.50
77300	0.25		77328	2.50
77301	3.00		77331	1.00
77305	0.75		77332	0.50
77310	1.00		77333	0.67
77315	2.00		77334	1.00
77321	2.00		77336	N/A
77326	1.00		77370	N/A

How does the 2003 Abt-2 time data compare to the 1995 Abt-1 data?

- External beam non-procedural times have gone down a little, indicating either shorter commissioning times or more procedures on the most heavily utilized machine
- Procedural times are a little shorter for external beam 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

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	1.16	2.50	3.21
77300	Bas Dos Calc	0.56	1.00	0.29
77301	IMRT Tx Plan	5.53	4.50	18.64
77305	S Isodose	0.54	1.00	0.54
77310	I Isodose	0.63	1.20	0.72
77315	C Isodose	0.83	1.50	1.30
77321	Tele Port Plan	1.06	1.50	1.52

QMP Work (table 2)

CPT	Procedure	Time	Inten.	Work
77326	S Br Isodose	1.20	1.50	1.87
77327	I Br Isodose	1.90	2.00	3.53
77328	C Br Isodose	3.18	3.00	8.67
77331	Sp Dosimetry	1.61	2.00	3.60
77332	S Tx Device	0.17	0.70	0.11
77333	I Tx Device	0.36	1.00	0.42
77334	C Tx Device	0.30	1.20	0.40

QMP Work (table 3)

CPT	Procedure	Time	Inten.	Work
77336	Continuing MP Consultation	1.50	1.00	1.50
77370	Special MP Consultation	5.60	3.87	20.92
773xx	IMRT Special MP Consultation	6.00	5.00	24.50

OK, how does MP work in 2003 compare to 1995

- Across the board, the work values are almost the same as in 1995
- There is one exception – 77370, Special MP Consultation increased in value from 15.00 to 20.92
- This is a result of both greater time and intensity for this service compared with 1995

Besides work, what else did you measure?

- We measured the acceptance of new technologies in the marketplace
- We measured the time required to perform 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	38%
Total Body Irradiation	57%
Electron Arc Irradiation	15%
Remote Afterloading Brachy	66%
Stereotactic Brachytherapy	17%
Stereotactic Radiosurgery	51%
Intraoperative Radiotherapy	25%
Prostate Seed Brachytherapy	89%
IMRT	57%
Endovascular Brachytherapy	74%

And what about the acceptance of new external beam features?

Record and Verify System	87
Dynamic Wedge	40
Multileaf collimator	79
Electronic Portal Imaging	53
Multileaf Collimator based IMRT	58

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

Total Skin Irradiation	8.5
Total Body Irradiation	4.5
Electron Arc Irradiation	12.0
Remote Afterloading Brachy	4.5
Stereotactic Brachy	5.5
Stereotactic Radiosurgery	8.0

More median special physics consultation times in hours

Stereotactic Radiotherapy	7.0
Intraoperative Radiotherapy	5.5
Prostate Seed Brachy	6.0
IMRT	10.0
3-D Conformal XRT	3.75
Endovascular Brachy	3.00

Show me median staffing results for medical physicists by patient load

Practice Type	**# Patients per QMP**
Private Community Hosp.	388
Med School Univ. Hosp.	258
MP Consult. Group	396
Physicians Group	194
Overall	328

OK, how about median overall staffing information?

# Patients treated per year	**1,080**
# Qualified Medical Physicists	3.5
# Radiation Oncologists	4.0
# Dosimetrists or Junior Medical Physicists	2.5
# Maintenance Engineers	1.0
# Radiation Therapists	7.0
# Radiation Oncology Nurses	2.8

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

77295	421	77327	15
77300	2,484	77328	71
77301	24	77331	114
77305	68	77332	150
77310	50	77333	132
77315	450	77334	1,833
77321	58	77336	3,100
77326	10	77370	132

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

77295	123	77327	5
77300	907	77328	23
77301	8	77331	31
77305	19	77332	40
77310	16	77333	34
77315	133	77334	720
77321	20	77336	1,100
77326	3	77370	123

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 establish patient charges
- Physicians use a similar cost 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 2003 Data

Practice Type	# of Total Patients Treated	# Patients Per QMP
Private Hospital	816	388
Med. Sch. Hosp.	1,500	258
Med. Phys. Consult. Grp.	465	396
Physicians Group	1019	194
Overall	1080	328

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

Abt 2003 Data

Practice Type	Medical Physicists	Radiation Oncologists	Dosime-trists
Private Hospital	2.0	2.8	1.9
Med. Sch. Hosp.	2.9	4.0	2.1
Med. Phys. Consult. Grp.	2.2	2.6	2.2
Physicians Group	2.3	3.1	1.6
Overall	2.6	3.0	1.9

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 2003 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 2003 service mix

Abt 2003 Data - Median Patient Load 328/Year

CPT Code	Med. # / 328 Patients Per Year	Medical Physicist Time (Ann.)	QMP Work (Ann.)
77295	123	143	395
77300	907	508	263
77301	8	44	149
77305	19	10	10
77310	16	10	12
77315	133	110	173
77321	20	21	30
77326	3	4	6
77327	5	10	18
77328	23	73	199
77331	31	50	112
77332	40	7	4
77333	34	12	14
77334	720	216	288
77336	1,100	1650	1650
77370	123	689	2573
	Total Time	3547 Total Work	5896

Wait a minute – are you saying we should work 3500 hours/year!?

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

3547 hours for 1 QMP responsible for 328 patients/year? 5896 Work units? What does this mean?

- The median FTE medical physicist provides services for approximately 328 patients per year
- The median time to provide the median service mix for 328 patients is ~ 3,500 hours
- The median number of work units Is ~ 5,900
- 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 3,500 to defend QMP FTE staffing and the number of QMP work units by 5,900 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 2003 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 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 2003 survey establishes the work performed by the qualified radiation oncology physicist
- CMS has a history of accepting independent surveys from Abt, Inc.
- The Abt 2003 survey allows the QMP to argue for staffing, quantity of work and compensation

How should we view our compensation for professional services in 2003?

- 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