

Utilization Trends in Prostate Cancer Therapy

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Abbreviations and Acronyms

3DCRT = 3-dimensional conformal radiation therapy
CaP = adenocarcinoma of the prostate
CB-IMRT = compensator based intensity modulated radiation therapy
CT = computerized tomography
IMRT = intensity modulated radiation therapy
LRP = laparoscopic radical prostatectomy
MB = Medicare beneficiaries
MedPAC = Medicare Payment Advisory Commission
MLC-IMRT = multi-leaf collimator intensity modulated radiation therapy
NBP = needle biopsies of the prostate
OpFac = outpatient facility
ORP = open radical prostatectomy
SBRT = stereotactic body radiation therapy
SEER = Surveillance, Epidemiology, and End Results

Purpose: We determined therapeutic trends in the management of adenocarcinoma of the prostate, and in the case of intensity modulated radiation therapy we investigated whether site of service influenced those trends.

Materials and Methods: A variety of CPT codes to treat adenocarcinoma of the prostate were extracted from the Medicare Part B 5% sample for the years 2006 to 2008 inclusive. Data were stratified by year, type of service and, in the case of radiation therapy, site of service. Treatment trends were calculated by indexing the total number of Medicare beneficiaries receiving a service against needle biopsies of the prostate.

Results: The percentage of Medicare beneficiaries receiving therapy indexed to needle biopsies of the prostate increased from 43.8% in 2006 to 49.0% in 2008. Trends in radiation and surgery were similar with 11.5% and 13% increases in each modality, respectively. Total Medicare beneficiaries receiving intensity modulated radiation therapy and laparoscopic radical prostatectomy increased by 25.4% and 22.1%, respectively, while Medicare beneficiaries treated with open radical prostatectomy and 3-dimensional conformal radiation therapy decreased by 27.9% and 37.6%, respectively. The pattern of use for intensity modulated radiation therapy was similar in physician office and hospital facility settings, increasing from 7.3% to 11.1% and 8.3% to 11.3% of Medicare beneficiaries indexed to needle biopsies of the prostate receiving intensity modulated radiation therapy at these sites in 2008, respectively.

Conclusions: Treatment trends in surgery and radiation strongly favor newer technologies, and in the case of intensity modulated radiation therapy, utilization trends for treatment of adenocarcinoma of the prostate are similar across all sites of service.

Key Words: prostatic neoplasms; physician's practice patterns; Medicare Part B; group practice; radiotherapy, intensity-modulated

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In the last decade we have seen a remarkable transformation in the therapeutic options available to patients diagnosed with adenocarcinoma of the prostate. Contributing to this transformation is the development of new technologies on the radiation and surgical fronts. Advances in radiation oncology include improved prostate brachytherapy and MLC-IMRT, recently enhanced with image guided targeting ability. Advances in surgical technique include the development of LRP with the subsequent addition of robot assisted LRP and cryoablation of the prostate (whole organ and focal). Based on available nonrandomized trials it is widely believed that the new technologies produce equivalent or superior outcomes with substantially improved morbidity. However, there are few objective data on the clinical superiority or cost-effectiveness of these technologies.¹⁻⁵

Also during the last decade economic and political pressures have resulted in the formation of large integrated urology group practices.⁶ Possible benefits of practice consolidation and integration include coordination of patient care and improved patient access to modern technology. Furthermore, previously reported advantages include economies of scale, provision of capital intensive ancillary services, and enhanced negotiating ability with health systems and third party payers, as well as improved interactions with regulatory agencies.⁶

Recently questions have been raised regarding the use patterns of ancillary services in the physician office vs (hospital) facility settings. In deliberations on October 8, 2009, January 15, 2010 and March 4, 2010 MedPAC remarked on unexplained growth in ancillary services in physician offices, inquiring about overuse of ancillary services resulting from the potential misuse of the in-office ancillary services exception to the Federal physician self-referral law (the Stark Law).⁷ MedPAC focused on diagnostic imaging, radiation therapy and laboratory testing. In contrast, 2 presentations delivered at the 2010 annual meeting of the American Urological Association denied any self-referral advantage in integrated urology groups with regard to imaging.^{8,9} One group measured use of CT before and after a large integrated urology group acquired its own imaging equipment and revealed that use of these scans did not change.⁸ Another group evaluated the frequency of CT equipment use in 3 large integrated urology groups, comparing 2 of the groups, which owned and billed for CT, with the third group, which did not own CT equipment and ordered such scans from an outside hospital or private radiologists. The group with no CT equipment ownership ordered more CT scans per diagnosis than the 2 groups that had a potential financial benefit.⁹

It has been reported that use of diagnostic services may increase when physicians own the imag-

ing equipment.¹⁰⁻¹⁵ Articles have appeared in the scientific literature and the lay press presuming that therapeutic decision making may also be influenced by factors other than sound clinical judgment.¹⁶⁻¹⁹ Therefore, in this population analysis we determined overall trends in the treatment of CaP and for radiation services determined whether these trends differed based on site of service.

MATERIALS AND METHODS

We evaluated trends in CaP therapy for Medicare beneficiaries in recent years. The 2006 to 2008 interval (inclusive) was selected because this period represented the most current data available, and also represented the time in which the rapid expansion of radiation oncology services occurred. We accessed the Medicare Part B 5% sample (the Medicare 5% sample) for a series of CPT codes used in conjunction with ICD-9 codes 185.xx (malignant neoplasm of the prostate). Also included was the CPT code for needle biopsy of the prostate (NBP, 55700) for all ICD-9 codes.

The surgical codes included those for ORP with and without pelvic lymphadenectomy (55840, 55845), cryoablation of the prostate (55873) and LRP (55866). Also included was CPT code 55899 (unlisted) for ICD-9 185.xx because this is typically used to describe robot assisted LRP. For radiation therapy services CPT codes 77413 and 77414 were used for 3DCRT, CPT code 77418 for MLC-IMRT, CPT code 0073T for CB-IMRT, CPT codes 77776, 77777 and 77778 for brachytherapy, and Healthcare Common Procedure Coding System code G0453 for prostate SBRT. To provide complete detail the numbers of MLC-IMRT and CB-IMRT were reported individually, but for the purpose of data analysis these CPT codes were aggregated under the umbrella of IMRT. In this discussion we considered IMRT and LRP to be more modern or advanced than their historical counterparts.

The Medicare 5% sample was aggregated into different cohorts with initial data stratification by year and nature of service. Subsequently for radiation services the data were further stratified into 3 distinct sites of service as defined by Medicare in the 5% data sample, namely office (outpatient services performed at an independent physician office), outpatient facility (OpFac, outpatient services performed at a hospital) and other (all other locations, ie inpatient hospital facilities or ambulatory surgery units). Because the absolute number of new cases of CaP in the Medicare population was not available for the period studied, to compare rates of service total beneficiary counts for each service in a subcategory were indexed against total NBPs performed on MB. This analysis was based on a review of SEER data from 2005 to 2007 demonstrating the ratio of age adjusted incidence of prostate cancer-to-NBP as reported in the 5% data sample is stable over time. NBP can be performed at any of the sites mentioned, and because the site of biopsy did not necessarily correlate with the location of definitive therapy, the sum of beneficiary counts for CPT 55700 for each data subset (office, OpFac, other) was used as the denominator for rate comparison.

National beneficiary counts

	No. 2006 (% of NBP)	No. 2007 (% of NBP)	No. 2008 (% of NBP)
Diagnostic NBP	236,020	235,760	208,120
Radiation:			
3DCRT	18,760 (7.9)	16,360 (6.9)	11,700 (5.6)
MLC-IMRT	36,480 (15.4)	45,720 (19.3)	45,960 (22)
CB-IMRT	1,040 (0.4)	1,240 (0.5)	1,100 (0.5)
Brachytherapy	19,738 (8.3)	18,440 (7.8)	15,260 (7.3)
SBRT	151 (0.1)	640 (0.2)	900 (0.4)
Totals	76,169 (32.2)	82,400 (34.9)	74,920 (35.9)
Surgical:			
Cryoablation	4,584 (1.9)	6,389 (2.7)	5,548 (2.6)
LRP	10,412 (4.4)	11,589 (4.9)	12,710 (6.1)
ORP	12,235 (5.1)	11,530 (4.8)	8,820 (4.2)
Totals	27,231 (11.5)	29,508 (12.5)	27,078 (13)

RESULTS

Overall Medicare beneficiary data are presented in the table. The total number of NBPs performed on MB decreased from 236,000 in 2006 to 208,120 in 2008. In 2006 in terms of radiation treatments 18,760 (7.9%) MB received 3DCRT, 37,520 (15.8%) IMRT, 19,738 (8.3%) prostate brachytherapy and 151 (0.1%) SBRT. By 2008, 11,700 (5.6%) received 3DCRT, 47,060 (22.5%) IMRT, 15,260 (7.3%) prostate brachytherapy and 900 (0.4%) SBRT. For surgical modalities in 2006, 4,584 (1.9%) MB received cryoablation, 10,412 (4.4%) LRP and 12,235 (5.1%) ORP. This pattern changed in 2008 with 5,548 (2.6%) receiving cryoablation, 12,710 (6.1%) LRP and 8,820 (4.2%) ORP.

In total, of the 56,280 MB treated with external beam radiation therapy in 2006, 37,520 (66.7%) received IMRT and 18,760 (33.3%) had 3DCRT. By 2008 of 58,760 MB treated with external beam radiation therapy, 47,060 (80.1%) received IMRT and 11,700 (19.9%) had 3DCRT. In 2006 of the 22,647 MB who underwent radical prostatectomy for CaP 10,412 (46.0%) had LRP and 12,455 (54.0%) received ORP. By 2008 of 21,530 MB undergoing radical prostatectomy for CaP 12,710 (59.0%) underwent LRP and 8,820 (41.0%) ORP.

Subsequent data breakdown was performed to determine the differential in trends of IMRT use by site of service. No attempts were made to stratify the use of surgical interventions because these were not typically performed at office sites. In 2006, 17,444 (7.3%) MB received IMRT at an office site, 19,731 (8.3%) at an OpFac site and 345 (0.1%) at other sites, while in 2008, 23,183 (11.1%) received IMRT at an office site, 23,493 (11.2%) at an OpFac site and 384 (0.1%) at other sites. For 2006 and 2008, when indexed to needle biopsy of the prostate, 7.3% and 11.1%, respectively, received office IMRT, while 8.3% and 11.2%, respectively, received OpFac IMRT. Only 0.1% of MB received IMRT at other sites in each of the 3 years studied.

DISCUSSION

The findings of this study support an increasing trend for MB to receive therapy for CaP in general between 2006 and 2008. As depicted in figure 1, between 2006 and 2008 the use of radiation therapy increased by 11.5% ([36.0%–32.3%]/32.3%) and the use of surgical procedures increased by 13.0% ([13%–11.5%]/11.5%). These trends are consistent with previous reports of increased definitive therapy among men with clinically localized prostate cancer as well as that the most common modality chosen for definitive therapy in men 65 years old or older was external beam radiation therapy.^{20,21} The reasons for increased treatment for CaP in the Medicare age group are not fully understood and likely multifactorial. A possible explanation for this finding is that men older than 65 years presently enjoy better health and longevity compared to their counterparts from prior decades. However, such a recent trend cannot be explained easily by decade differences in health. Another possible explanation is that recent changes in CaP treatment are more attractive as treatment options to patients with localized CaP. From the standpoint of surgery there is a perception that LRP provides the same cancer control as open prostatectomy with less blood loss, decreased post-operative pain, shorter hospital stay and shorter period of catheter dependence to the point that LRP represents the majority of surgical treatments performed for CaP in the United States.^{4,22} At the same time, there have been reports that in radiation therapy for localized CaP the use of newer technologies may allow the treatment of more virulent tumors with fewer side effects than older methodologies.^{23,24}

In terms of radiation therapy in this ecological study we did not differentiate between office IMRT procedures performed by integrated urological practices and those practices with no urology affiliation. As it can be argued that the same perverse incentive to perform procedures exists in any circumstance

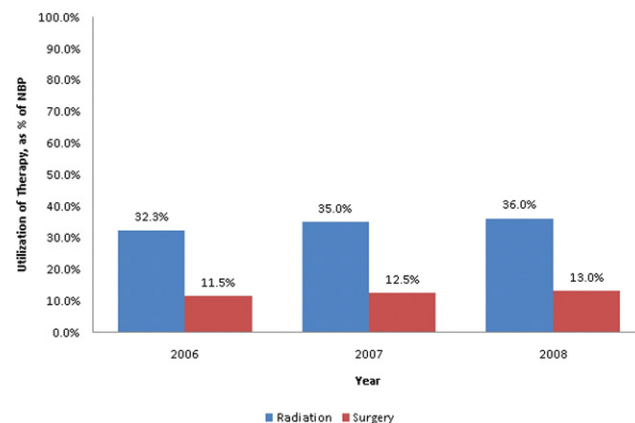


Figure 1. Choice of therapy, national, as percentage of NBP

where physicians have an ownership interest in the therapeutic equipment, we assessed whether population analysis indicated differences in treatment patterns where there is any physician ownership of the therapeutic equipment.

The age adjusted incidence of CaP can be derived from SEER data. However, the data are not currently available for the entire study period.²⁵ As our intent was to study trends in CaP therapy as opposed to actual rates of use of different therapies, we indexed our data to the number of NBPs performed on MB during a given period. Despite variability in the positive NBP rate,²⁶ the positive NBP rate for MB as a whole likely remains constant. Thus, regardless of the absolute positive rate of biopsy, the relative rate of therapy remains unchanged by the distributive property of division. We recognize that some MB will be diagnosed with CaP by other methods (ie transurethral prostatic resection specimen) or receive therapy in a year other than the year in which they underwent biopsy. It is likely this would affect all therapeutic groups equally.

The data suggesting an increase in the surgical treatment of localized CaP in the Medicare age group are surprising, especially considering past trends. For example in a SEER-Medicare linked database review between 1991 and 2002, it was noted that the percentage of MB treated surgically for CaP decreased from 54% in 1991 to 24% by 2002.²⁷ It is important to note that 2002 anteceded the significant urology group practice formation, suggesting that the trend away from surgery was already well established before urol-

ogists evinced any interest in incorporating radiation therapy for CaP into office based clinical practices. However, the actual reason(s) for the growth of interest on the part of MB in surgical or radiation related therapy are presumed and unknown.

During the study interval there were changes in trends for surgery and radiation therapy. IMRT was the most common form of radiotherapy with a growth rate of 25.4% from 2006 to 2008 ([47,060–37,520]/37,520). There were also offsetting decreases in the use of 3DCRT (–37.6% [11,700–18,760]/18,760) accompanying the growth of IMRT. Interestingly during this interval there was minimal change in the overall amount of prostate brachytherapy for MB (8.4% of treatments indexed to NBP in 2006 vs 7.3% in 2008). There also were increases with regard to minimally invasive operations such as LRP vs open procedures. The growth rate of LRP vs the decrease in open operations in this short span was nearly as dramatic as the changes in radiation, with an increase in LRP of 22.1% ([12,710–10,412]/10,412) vs a decrease of 27.9% ([12,235–8,820]/12,235) in open prostatectomy.

The analysis of site of service trends in prescribing these new technologies (particularly in radiotherapy, because surgical procedures are usually performed at facilities, not physician offices) is important in determining if there is inappropriate use of such technologies. Although there was significant growth at office and OpFac sites of service, the pattern of growth of IMRT for CaP treatment is demonstrated in figure 2 and is similar across these sites

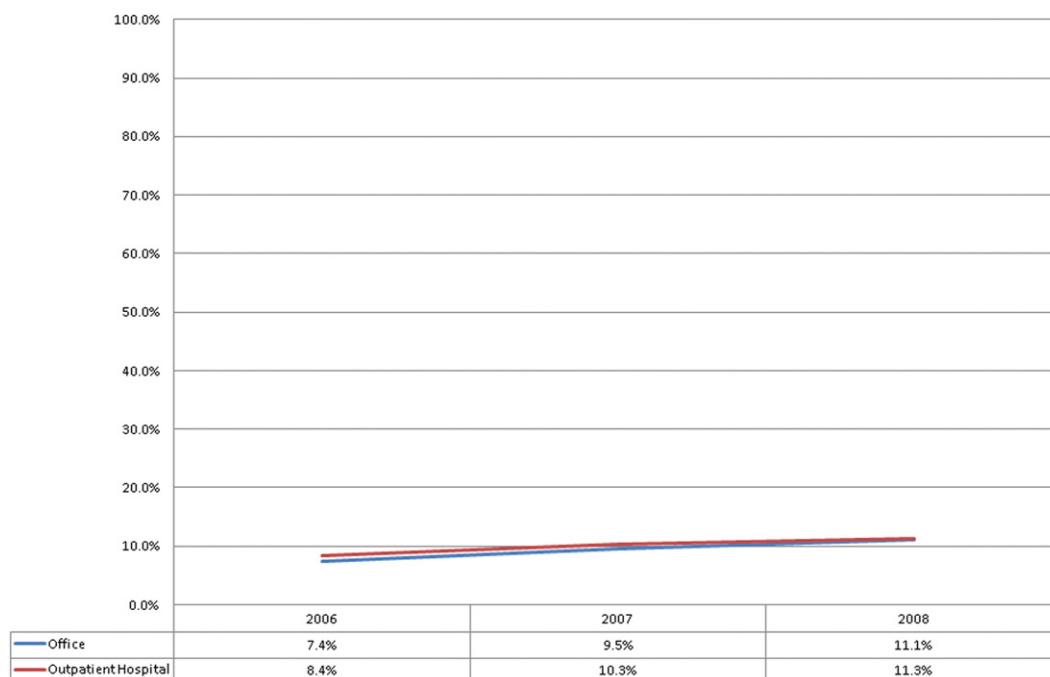


Figure 2. IMRT utilization trends by site of service, as percentage of NBP

of service. Although this study does not address the impact of urology group ownership on IMRT use, interestingly the MedPAC report of June 15, 2010 noted that despite an 84% increase in expenditures for radiation oncology for certain services between 2003 and 2008, the relative percentage of expenditures by nonradiation oncologists accounted for approximately the same share of overall physician fee schedule payments for radiation oncology (4.7% in 2003 vs 5.1% in 2008).²⁸

CONCLUSIONS

Although there has been an undeniable increase in overall treatment rates for CaP and certain therapies for its treatment, the reasons for this tendency are likely multifactorial. There is a clear trend toward the use of newer technologies in surgery and radiation. Specifically regarding radiation, these trends extend across sites of service and reflect changing clinical standards in the management of CaP.

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