The George Washington University Cancer Institute
The George Washington University Hospital
The GW Medical Faculty Associates
The Dr. Cyrus and Myrtle Katzen Cancer Research Center

Cancer Programs and Cancer Registry

Annual Report 2013
Research, Compassionate Care, Education, and Service
The GW Cancer Program is a model partnership that unites the best clinical and research experiences from the George Washington University Hospital (GW Hospital), the GW Cancer Institute, the GW School of Medicine and Health Sciences, and the GW Medical Faculty Associates (GW MFA) for the best Cancer Program. We were proud to be the fourth-time Recommendation Rating receiver from the American College of Surgeons (ACoS)/Commission on Cancer (CoC). Its accomplishments from the previous year along with the goal for the coming year are a framework of our successful GW cancer program.

The Breast Center continued receiving national accredited from ACoS/NAPBC (National Accreditation Program for Breast Center). The reconstruction on 2300 M street building is going well. The plan for the move of breast center and breast imaging to this new location is confirmed in March of 2014. Radiation will move from the temporary location on the corner of 23rd and H Street to a permanent site of GW MFA.

It is a pleasure to see each department continue to grow. We are welcome new physicians: Dr. Keith Mortman from Thoracic Surgery department; Claire Edwards, M.D., assistant clinical professor of surgery, the third breast surgeon from the Breast Center; and Elizabeth Starks, M.S. m CGC, the genetics counselor from Hematology Oncology department.

The GW Outreach subcommittee organized many successful screening and awareness for different cancers throughout the year. The GW Mammovan is still serving the Washington, D.C. women. The Sept.13 Cancer Screening Day event provided full body skin cancer screening, head and neck, prostate, manual breast exam for community.

Cancer research clinical trials are increasing. Katzen Board Committee has approved for $450,000 grant for 2013 cancer innovate grant program. Drs Rebecca Kaltman and Lisa McGrail who specialize in breast cancer have created more breast cancer clinical trials. Clinical study was done at pathology department to review ischemic time for HER2, ER/PR testing to ensure valid results. This will become CAP standard for pathology reports in 2014.

The distress screening pilot was carried out at breast center successfully and extended to Division of Hematology Oncology. Jennifer Bires and Monica Dreyer have adopted NCCN distress management template to hand it to newly diagnosed breast cancer patients. We also formed the Survivorship Care Planning subcommittee to work on template to be used for all type cancers.

The GW Cancer Registry remains a vital part of the GW Cancer Program. The growth of the GW Cancer Registry has been along with the increasing cancer caseload during last five years. The number of patients diagnosed and/or treated at the GW Hospital increased from 1,232 in 2008 to 1,455 cancer cases admitted GWUH in 2012. We participated in the Rapid Quality Reporting System (RQRS), a new tool of data reporting from the National Cancer Data Base. We will submit all eligible cases for valid performance measures and will receive alerts for individual cases in which adjuvant therapy has not been reported in a timeliness required by CoC.

I am proud to be a part of the GW multidisciplinary Cancer Program and thanks for all the hard work, accomplishments, and commitment that all of you contribute during the past year.

Sincerely,

Robert S. Siegel, M.D. ’77
Director of the Dr. Cyrus and Myrtle Katzen Cancer Research Center
Chair, Cancer Committee
Professor of Medicine
REGISTRY REPORT
The GW cancer registry has grown for the past five years. The number of patients diagnosed and/or treated (analytic cases) at the George Washington University Hospital (GW Hospital) has increased from 1,232 in 2008 to 1,453 in 2012 (Figure 1). Of these patients, 1,328, or 91 percent, were diagnosed and treated at GW Hospital. The remaining 125 cases, or 9 percent, were diagnosed only cases.

According to Table 1, the major patient population at GW was white: 49 percent white vs 38 percent black vs 13 percent other ethnicity. The five major cancer sites at treated or diagnosed at GW Hospital continued to be breast, lung, prostate, colon/rectum, and kidney cancers. Figure 2 shows an increase in incidence in lung cancer, anal cancer from 0.5, soft tissue cancer, and male genital cancer, but more significantly the figure shows an increase in breast cancer from 17.9 percent in 2011 to 26.7 percent in 2012.

Table 2A and 2B shows a comparison between GW Hospital cancer cases and national American Cancer Society (ACS) data for male and female patients. Lung and colon/rectum cancers are major cancers among the GW Hospital’s male patient population compared to GW Hospital’s female patient population. Thyroid cancer is a major female cancer in both GW and ACS data: 5.0 percent in both GW and ACS female population vs. 3.1 percent in GW male and 2.0 percent in ACS male data respectively. Cancers of urinary system — including kidney/renal pelvis/ureter/urinary bladder — are major cancers for both GW and ACS male population: 17.5 percent in GW and 12.0 percent in ACS males vs. 7.9 percent in GW and 5 percent in ACS female population.
# TABLE 1: THE GW HOSPITAL CANCER REGISTRY, 2012 CANCER CASES BY ANATOMIC SITE

<table>
<thead>
<tr>
<th>PRIMARY SITE</th>
<th># CASES</th>
<th>% CASES</th>
<th>CLASS OF CASES</th>
<th>RACE***</th>
<th>AJCC STAGE AT DIAGNOSIS (ANALYTIC CASES ONLY)</th>
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<td></td>
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<td>NON-ANALYTIC **</td>
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<tr>
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<tr>
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<tr>
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<td>135 10</td>
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<tr>
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<tr>
<td>Stomach</td>
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<tr>
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<tr>
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<tr>
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<tr>
<td>Respiratory System</td>
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<td>92 4</td>
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<tr>
<td>Bronchus &amp; Lung</td>
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<td>6.5</td>
<td>91 3</td>
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<tr>
<td>Pleura</td>
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<tr>
<td>Soft Tissues</td>
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<td>1.8</td>
<td>21 5</td>
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<tr>
<td>Bone</td>
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<td>2  1</td>
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</tr>
<tr>
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<td>38 6</td>
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</tr>
<tr>
<td>Non-Hodgkin's</td>
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<td>28 5</td>
<td>17  4 7  0  7  1  4  16 0  0</td>
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</tr>
<tr>
<td>Hodgkin's</td>
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<td>10 1</td>
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<tr>
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<td>Female Genital</td>
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<tr>
<td>Cervix uteri</td>
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<td>0.3</td>
<td>3  1</td>
<td>1   1  1  0  3  0  0  0  0  0</td>
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</tr>
<tr>
<td>Corpus uteri</td>
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<td>12 1</td>
<td>3   4  5  0  7  2  2  1  0  0</td>
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</tr>
<tr>
<td>Vagina</td>
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<td>0   1  0  0  1  0  0  0  0  0</td>
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<tr>
<td>Ovary</td>
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<td>0.8</td>
<td>6  6</td>
<td>2   3  1  0  4  1  1  0  0  0</td>
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</tbody>
</table>
## TABLE 1: THE GW HOSPITAL CANCER REGISTRY, 2012 CANCER CASES BY ANATOMIC SITE

| PRIMARY SITE   | # CASES | % CASES | CLASS OF CASES | RACE*** | AJCC STAGE AT DIAGNOSIS (ANALYTIC CASES ONLY) | NON-ANALYTIC | ANALYTIC ** | W | B | O | I | II | III | IV | 88 | UNK |
|----------------|---------|---------|----------------|---------|-----------------------------------------------|--------------|------------|----|----|----|----|----|----|----|----|----|----|
| Male Genital   | 228     | 15.7    | 217            | 11      | 101                                           | 87           | 29         | 2  | 42 | 123| 40 | 9  | 0  | 1  |
| Prostate gland | 207     | 14.3    | 196            | 11      | 87                                            | 84           | 25         | 0  | 27 | 121| 39 | 9  | 0  | 0  |
| Testis         | 19      | 1.3     | 19             | 0       | 13                                            | 2            | 4          | 1  | 15 | 2  | 0  | 0  | 0  | 1  |
| Penis          | 2       | 0.1     | 2              | 0       | 1                                             | 1            | 0          | 1  | 0  | 0  | 1  | 0  | 0  | 0  |
| Urinary System | 178     | 12.3    | 173            | 5       | 92                                            | 54           | 27         | 42 | 80 | 17 | 21 | 13 | 0  | 0  |
| Urinary bladder| 66      | 4.6     | 64             | 2       | 29                                            | 23           | 12         | 31 | 16 | 9  | 1  | 7  | 0  | 0  |
| Kidney         | 88      | 6.1     | 86             | 2       | 50                                            | 24           | 12         | 0  | 58 | 6  | 17 | 5  | 0  | 0  |
| Renal Pelvis – Ureter | 22 | 1.5   | 21             | 1       | 13                                            | 7            | 1          | 10 | 5  | 2  | 3  | 1  | 0  | 0  |
| Urethra        | 2       | 0.1     | 2              | 0       | 0                                             | 0            | 2          | 1  | 1  | 0  | 0  | 0  | 0  | 0  |
| Nervous System | 53      | 3.6     | 47             | 6       | 31                                            | 13           | 3          | 0  | 0  | 0  | 0  | 47 | 0  | 0  |
| Brain/Spinal Cord | 39 | 2.7   | 38             | 1       | 29                                            | 7            | 2          | 0  | 0  | 0  | 0  | 0  | 38 | 0  |
| Meninges       | 11      | 0.7     | 9              | 2       | 2                                             | 6            | 1          | 0  | 0  | 0  | 0  | 0  | 9  | 0  |
| Other Parts of CNS | 3   | 0.2   | 3              | 0       | 0                                             | 0            | 0          | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| Endocrine System | 78   | 5.4    | 71             | 7       | 36                                            | 23           | 12         | 0  | 38 | 7  | 4  | 5  | 17 | 0  |
| Thyroid gland  | 59      | 4.1     | 54             | 5       | 29                                            | 13           | 12         | 0  | 38 | 7  | 4  | 5  | 0  | 0  |
| Other glands & Thymus | 19 | 1.3   | 17             | 2       | 7                                             | 10           | 0          | 0  | 0  | 0  | 0  | 0  | 17 | 0  |
| Hematopoietic  | 77      | 5.3     | 66             | 11      | 37                                            | 19           | 10         | 0  | 0  | 0  | 0  | 66 | 0  | 0  |
| Multiple Myeloma | 21   | 1.4    | 19             | 2       | 7                                             | 10           | 2          | 0  | 0  | 0  | 0  | 0  | 19 | 0  |
| Acute Leukemia | 12      | 0.8     | 9              | 3       | 6                                             | 3            | 0          | 0  | 0  | 0  | 0  | 0  | 9  | 0  |
| Chronic Leukemia | 15 | 1.0   | 14             | 1       | 7                                             | 2            | 5          | 0  | 0  | 0  | 0  | 0  | 14 | 0  |
| Hair Cell Leukemia | 2 | 0.1   | 2              | 0       | 2                                             | 0            | 0          | 0  | 0  | 0  | 0  | 2  | 0  | 0  |
| Other blood disorder | 27 | 2.0  | 22             | 5       | 15                                            | 4            | 3          | 0  | 0  | 0  | 0  | 22 | 0  | 0  |
| Skin           | 33      | 2.3     | 17             | 16      | 17                                            | 0            | 0          | 1  | 12 | 1  | 2  | 1  | 0  | 0  |
| Melanoma       | 16      | 1.1     | 16             | 0       | 16                                            | 0            | 1          | 2  | 12 | 1  | 1  | 1  | 0  | 0  |
| Other Skin Cancer | 17 | 1.2   | 16             | 1       | 1                                             | 0            | 0          | 0  | 0  | 0  | 1  | 0  | 0  | 0  |
| Unknown        | 19      | 1.3     | 18             | 1       | 12                                            | 5            | 1          | 0  | 0  | 0  | 0  | 18 | 0  | 0  |
| All Sites      | 1453    | 100     | 1328           | 125     | 647                                           | 500          | 181        | 156| 454| 273| 155| 128| 153| 9  |

**NOTE:**
- * Analytic – initially diagnosed at GW Hospital and all or part of first course of therapy at GW Hospital or case diagnosed elsewhere and all or part of first course of therapy at GW Hospital.
- ** Non-Analytic case – initially diagnosed and treated elsewhere, referred to GW Hospital for recurrence or subsequent therapy and physician office cases.
- *** Race – W=White; B=Black; O=Other
- AJCC staging at diagnosis is either clinical or pathological staging.
### TABLE 2A: 2010-12 ANALYTIC CASES — THE MOST FREQUENT CANCERS IN MALE

<table>
<thead>
<tr>
<th>PRIMARY SITE</th>
<th>2012 CASES (%)</th>
<th>2011 CASES (%)</th>
<th>2010 CASES (%)</th>
<th>2012 CASES (%)</th>
<th>2011 CASES (%)</th>
<th>2010 CASES (%)</th>
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<tr>
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<td>GWUH</td>
<td>ACS</td>
<td>GWUH</td>
<td>ACS</td>
<td>GWUH</td>
<td>ACS</td>
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<tr>
<td>PROSTATE</td>
<td>196 (30.5)</td>
<td>241,740 (28.0)</td>
<td>243 (34.6)</td>
<td>240,890 (29.0)</td>
<td>310 (40.0)</td>
<td>217,730 (28.0)</td>
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<tr>
<td>KIDNEY/RENAL PELVIS</td>
<td>71 (11.1)</td>
<td>40,250 (5.0)</td>
<td>76 (10.8)</td>
<td>37,120 (5.0)</td>
<td>83 (10.7)</td>
<td>35,370 (4.0)</td>
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<td>LUNG</td>
<td>46 (7.2)</td>
<td>116,470 (14.0)</td>
<td>44 (6.3)</td>
<td>115,060 (14.0)</td>
<td>63 (8.0)</td>
<td>116,750 (15.0)</td>
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<td>URINARY BLADDER</td>
<td>41 (6.4)</td>
<td>55,600 (7.0)</td>
<td>37 (5.3)</td>
<td>52,020 (6.0)</td>
<td>52 (6.7)</td>
<td>52,760 (7.0)</td>
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<td>COLON-RECTUM</td>
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<td>71,850 (9.0)</td>
<td>34 (4.4)</td>
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<td>11,890 (2.0)</td>
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<td>LARYNX</td>
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<td>9,840 (1.0)</td>
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<td>10,110 (1.0)</td>
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<td>642 (100.0)</td>
<td>848,170 (100.0)</td>
<td>703 (100.0)</td>
<td>822,300 (100.0)</td>
<td>776 (100.0)</td>
<td>789,620 (100.0)</td>
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### TABLE 2B: 2010-12 ANALYTIC CASES — THE MOST FREQUENT CANCERS IN FEMALE

<table>
<thead>
<tr>
<th>PRIMARY SITE</th>
<th>2012 CASES (%)</th>
<th>2011 CASES (%)</th>
<th>2010 CASES (%)</th>
<th>2012 CASES (%)</th>
<th>2011 CASES (%)</th>
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<td>ACS</td>
<td>GWUH</td>
<td>ACS</td>
<td>GWUH</td>
<td>ACS</td>
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<td>BREAST</td>
<td>353 (51.5)</td>
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<td>239 (37.9)</td>
<td>230,480 (30.0)</td>
<td>256 (39.7)</td>
<td>207,090 (28.0)</td>
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<tr>
<td>LUNG</td>
<td>45 (6.6)</td>
<td>109,690 (14.0)</td>
<td>42 (6.7)</td>
<td>106,070 (14.0)</td>
<td>65 (10.0)</td>
<td>105,770 (14.0)</td>
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<tr>
<td>KIDNEY/RENAL PELVIS</td>
<td>31 (4.5)</td>
<td>24,520 (3.0)</td>
<td>42 (6.7)</td>
<td>23,800 (3.0)</td>
<td>39 (6.0)</td>
<td>22,870 (3.0)</td>
</tr>
<tr>
<td>THYROID</td>
<td>34 (5.0)</td>
<td>43,210 (5.0)</td>
<td>42 (6.7)</td>
<td>36,550 (5.0)</td>
<td>40 (6.2)</td>
<td>33,930 (5.0)</td>
</tr>
<tr>
<td>LEUKEMIA/OTHER</td>
<td>28 (4.1)</td>
<td>20,320 (3.0)</td>
<td>39 (6.2)</td>
<td>19,280 (3.0)</td>
<td>15 (2.3)</td>
<td>18,360 (2.0)</td>
</tr>
<tr>
<td>BRAIN/ OTHER CNS</td>
<td>16 (2.3)</td>
<td>10,280 (1.0)</td>
<td>32 (5.1)</td>
<td>10,080 (1.0)</td>
<td>30 (4.7)</td>
<td>10,040 (1.0)</td>
</tr>
<tr>
<td>COLON/RECTUM</td>
<td>22 (3.2)</td>
<td>70,040 (9.0)</td>
<td>32 (5.1)</td>
<td>69,360 (9.0)</td>
<td>48 (7.4)</td>
<td>70,480 (10.0)</td>
</tr>
<tr>
<td>URINARY BLADDER</td>
<td>23 (3.4)</td>
<td>17,910 (2.0)</td>
<td>24 (3.8)</td>
<td>17,230 (2.0)</td>
<td>33 (5.1)</td>
<td>17,770 (2.0)</td>
</tr>
<tr>
<td>CORPUS UTERINE</td>
<td>12 (1.7)</td>
<td>47,130 (6.0)</td>
<td>15 (2.4)</td>
<td>46,470 (6.0)</td>
<td>15 (2.3)</td>
<td>43,470 (6.0)</td>
</tr>
<tr>
<td>NON-HODGKIN’S Lymphoma</td>
<td>15 (2.2)</td>
<td>31970 (4.0)</td>
<td>11 (1.7)</td>
<td>30,300 (4.0)</td>
<td>16 (2.5)</td>
<td>30,160 (4.0)</td>
</tr>
<tr>
<td>STOMACH</td>
<td>10 (1.4)</td>
<td>8,300 (1.0)</td>
<td>10 (1.6)</td>
<td>8,400 (1.0)</td>
<td>9 (1.4)</td>
<td>8,270 (1.0)</td>
</tr>
<tr>
<td>PANCREAS</td>
<td>9 (1.3)</td>
<td>21,830 (3.0)</td>
<td>10 (1.6)</td>
<td>21,980 (3.0)</td>
<td>9 (1.4)</td>
<td>21,770 (3.0)</td>
</tr>
<tr>
<td>OTHERS</td>
<td>88 (12.8)</td>
<td>15,8670 (20.0)</td>
<td>92 (14.5)</td>
<td>15,4370 (19.0)</td>
<td>71 (11.0)</td>
<td>154,710 (21.0)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>686 (100.0)</td>
<td>790,740 (100.0)</td>
<td>630 (100.0)</td>
<td>774,370 (100.0)</td>
<td>646 (100.0)</td>
<td>739,940 (100.0)</td>
</tr>
</tbody>
</table>
FIGURE 2: TREND FOR NEW ANALYTIC CASES BY ANATOMIC SITES AND YEAR OF ADMISSION

- Prostate Cancer
- Breast Cancer
- Urinary System
- Lung Cancer
- Colorectal Cancer
- Nervous System
- Thyroid and Other Endocrine Glands
- Head and Neck Cancers
- Lymphoma and Hematopoietic Neoplasms
- Anal Cancer
- Male Genital Cancer
- Female Reproductive Cancer
- Soft Tissue
- Melanoma

2011
2012
Preliminary Review of Correlation of Dose Volume Histogram of the normal tissues and complications/side effects for prostate cancer patients treated with Intensity-Modulated Radiation Therapy

By Martin Ojong, M.D., Assistant Professor of Radiology

Prostate cancer is the most common malignancy in males treated at our medical cancer. The advent of Intensity-Modulated Radiation Therapy (IMRT) has provided us with the ability to escalate the prescribed dose, which could lead to increased normal tissue toxicity if normal tissue toxicity guidelines are not followed closely. The purpose of this review is to highlight the implementation of IMRT/RapidArc and Cone Beam CT (CBCT) image guidance at our medical center with patient safety in mind. This is a preliminary review of all prostate cancer patients with IMRT/RapidArc with CBCT Image guidance radiotherapy (IGRT).

MATERIALS AND METHODS: PATIENT CHARACTERISTICS

This is a preliminary review of 40 consecutive prostate cancer patients, treated at George Washington University Hospital (GW Hospital) in 2010 and 2011. Two cases were eliminated after initial review because they were metastatic. Of the remaining 38 cases, 24 cases were treated with a mix of 3D Conformal Radiotherapy Therapy (3DCRT) to the whole pelvis followed by an IMRT boost to the prostate or prostate bed. The remaining 14 patients were treated with “full course” IMRT with image-guidance using cone beam CT (CBCT) and are the subject of this preliminary review.

The patients were 47-81 years old, with an average age of 66 years. Two patients were treated in the adjuvant setting, after Robotic Assisted Laparoscopic Prostatectomy (RALP) and 12 patients were treated with definitive radiotherapy, with or without Androgen Suppression Therapy (AST). The pretreatment PSA ranged from 5.0 to 50 in the definitive cases. It was 1.5 and 1.2 respectively for the two patients treated in the adjuvant setting. The Gleason score was 7 in nine cases, nine in four cases, and 6 in one case.

Ten of 14 cases had documented pretreatment International Prostate Symptom (I-PSS) scores. These ranged from 1 to 26, with six patients having scores 9 or higher. Pretreatment Quality of life (QOL) parameters were available in 10 patients. The QOL scores ranged from 0 to 5. 7 of 14 patients had baseline values for SHIM ranging from 1-21, with six of them having scores 5 and higher. Eight of 14 patients received Androgen Suppression Therapy (AST).

TREATMENT PLANNING AND DELIVERY

All patients were instructed to present for CT simulation and subsequent daily treatments with a full bladder and an empty rectum. They were place supine on a Phillips CT-simulator table and immobilized with a thermoplastic cast and hip fix. The mm CT cuts were obtained from the top of L3 vertebral body to below the lesser trochanters. The Clinical Tumor Volume (CTV) was defined as the prostate and proximal seminal vesicles (definitive radiotherapy) or prostate bed in the adjuvant setting. The regional lymph nodes were also outlined based on the demographics, clinical and pathologic features of each individual case. Surrounding normal structures including the bladder, rectum, small bowel, and femoral heads were also outlined. Treatment planning, using standardize normal structure dose volume constraints, was done using the ADAC/Pinnacle and Varian Eclipse treatment planning systems. All patients were treated with treated on the Varian CLINAC 21 EX with CBCT image guidance.

With IMRT/RapidArc and CBCT we were able to escalate the treatment dose to some extent without exceeding recommended dose volume histograms (DVHs) for surrounding normal tissues.
field, step-and-shoot, IMRT technique or RapidArc to a dose of 4,500 cGy in 25 fractions. This was then followed by a boost 3,000 to 3,400 cGy in 15-17 fractions to the prostate gland and proximal seminal vesicles or to the prostate bed, using a 5-field, step-and-shoot, IMRT technique or RapidArc. For patients treated to the prostate only we used a 5-field, step-and-shoot, IMRT technique or RapidArc.

In the adjuvant setting, the prescribed dose to the prostate bed was 6800 cGy and 6900 cGy, respectively. For patient treated with definitive radiotherapy, the prescribed dose to the prostate ranged from 7400 cGy to 8000 cGy, with the majority of the patients (11 of 12) receiving at least 7600 cGy. Eight (8) of 14 patients received AST.

**DOSE VOLUME CONSTRAINTS**

The volume of the rectum during treatment planning ranged from 73.42 to 201.67 cc. It was between 100 and 200 cc in eight of 14 patients. The ratio of the average volume of the rectum during treatment and the volume of the rectum at initial planning ranged from 0.55 to 1.22, with five of 14 patients having a treated versus planned rectal volume ratio of less than 0.75.

The volume of the bladder during treatment planning ranged from 62.78 cc to 430.73 cc. The bladder volume was between 150 cc and 307 cc in 8 of 14 patients. The ratio of the average volume of the bladder during treatment and the volume of the bladder at initial planning ranged from 0.61 to 2.28, with the majority (10 of 14) having a treated versus planned bladder volume ratio of 0.70 to 1.24.

**RESULTS**

The mean prescribed rectal dose (V50rectum) ranged from 3627 cGy to 6014 cGy. It was less than 5500 cGy in 13 of 14 patients. The maximum rectal dose ranged from 7307 cGy to 8513 cGy.

The mean prescribed bladder dose (V50bladder) ranged from 3245 cGy to 6646 cGy. The mean bladder dose was less than 6400 cGy in 13 of 14 patients. The maximum bladder dose ranged from 7356 cGy to 8593 cGy.

Pre-radiotherapy IPPSS, SHIM and QOL scores were available in 10 of 14 patients. Following RT, however, the IPPSS score was available in only five of these patients. Three of six patients with IPPSS, scores 3-12 months after radiotherapy, showed improvement of symptoms. The other three had worsening of symptoms. Only one of five patients with post treatment (RT) QOL data experienced worsening of his score. Post treatment SHIM scores were available in only four patients. The score improved in one patient, declined in one patient, and remained stable in two patients.

One patient had microscopic hematuria and three patients had documented rectal bleeding, NOS, none serious enough to require blood transfusion or surgical intervention.

**DISCUSSION AND CONCLUSION**

The use of IMRT/RapidArc with CBCT image guidance permitted us to safely deliver escalated doses to the prostate gland/prostate bed and regional lymph nodes in all our patients. With the use of CBCT we were able to reduce the variability of the bladder volume throughout the course of treatment. CBCT image guidance was helpfully in facilitating adherence to internationally recommended Dose Volume Histogram (DVH) constraints, especially for the bladder and rectum. The impact of radiotherapy on I-PSS, QOL, and SHIM scores is hard to determine, given the small number of study sample and possible interaction of the different treatment modalities (RT, AST, and surgery) used in the majority of the patients. With IMRT/RapidArc and CBCT we were able to escalate the treatment dose to some extent without exceeding recommended dose volume histograms (DVHs) for surrounding normal tissues. A multidisciplinary approach is needed to address all post treatment complications and quality of life issues presented by this patient population.

**REFERENCES:**


RESOURCES AND SUPPORT

The George Washington University Hospital
900 23rd St., N.W.
Washington, D.C. 20037
(202) 715-4000
1-888-4GW-DOCS
www.gwhospital.com

Hematology/Oncology
2150 Pennsylvania Ave., N.W.
3rd Floor
Washington, D.C. 20037
(202) 741-2210

Pain Management Center
2131 K St., N.W.
Washington, D.C. 20037
(202) 715-4599

Pathology
900 23rd St., N.W.
Washington, D.C. 20037
(202) 715-4665

Cancer Survivorship Clinic
2150 Pennsylvania Ave., N.W.
4th Floor
Washington, D.C. 20037
(202) 741-2222

Mobile Mammography Program
2150 Pennsylvania Ave., N.W.,
D.C. Level
Washington, D.C. 20037
(202) 741-3020

Radiation Oncology
2150 Pennsylvania Ave., N.W.,
Washington, DC 20037
(202) 715-5120

Radiology
900 23rd St., N.W.
Washington, D.C. 20037
(202) 715-5183

Rehabilitation Services
2131 K St., N.W.
Washington, D.C. 20037
(202) 715-5655

Social Work Services
2150 Pennsylvania Ave., N.W.
3rd Floor
Washington, D.C. 20037
(202) 741-2218, (202) 994-2449

Surgery
2150 Pennsylvania Ave., N.W.
6th Floor
Washington, D.C. 20037
(202) 741-3200

The GW Medical Faculty Associates
2150 Pennsylvania Ave., N.W.
Washington, D.C. 20037
(202) 741-3000
www.gwdocs.com

The George Washington Cancer Institute
2600 Virginia Ave.
3rd Floor
Washington, D.C. 20037
(202) 994-2449
www.gwcancerinstitute.org

The Dr. Cyrus and Myrtle Katzen Cancer Research Center
2150 Pennsylvania Ave., N.W., Suite 1-200
Washington, D.C. 20037
(202) 741-2250
www.katzen_cancer.org

The GW Comprehensive Breast Center
2300 M St., N.W., 8th Floor
Washington, D.C. 20037
(202) 741-3270

Cancer Education and Outreach
2600 Virginia Ave.
3rd Floor
Washington, D.C. 20037
(202) 994-2449

Cancer Prevention and Control
2600 Virginia Ave.
3rd Floor
Washington, D.C. 20037
(202) 994-2449

Cancer Registry
900 23rd St., N.W.
Washington, D.C. 20037
(202) 715-4383

Clinical Oncology
2150 Pennsylvania Ave., N.W.
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(202) 741-2210

Mobile Mammography Program
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Washington, D.C. 20037
(202) 741-3200

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RESOURCES AND SUPPORT

The Dr. Cyrus and Myrtle Katzen Cancer Research Center (Katzen Center) supports a wide variety of free, holistic and wellness services for cancer patients and their families.

GW Medical Faculty Associates (GW MFA) 2150 Pennsylvania Ave., N.W. Washington, D.C. 20037

Active Treatment (all cancers)
Open to patients currently undergoing treatment.
Second and fourth Wednesday each month, 12:30–1:30 pm
MFA, first floor, 1-402
Facilitator: Jennifer Bires, LICSW, (202) 741-2218

Caregivers’ Support Group
Share common concerns, give and receive advice, and learn coping skills.
Third Tuesday each month, 12:30–1:45 pm
MFA, first floor, 1-402
Facilitator: Lindsay Blair, M.S.W., (202) 677-6229

Gynecological Cancer Support Group
First and third Wednesday each month 12:30–1:30 pm
MFA, first floor, 1-402
Facilitator: Lindsay Blair, M.S.W., (202) 677-6229

Head and Neck Cancer Group
For patients, survivors, and caregivers of head and neck cancers.
First Tuesday each month, 12:30–1:30 pm
MFA, Katzen Center board room
Facilitator: Lindsay Blair, M.S.W., (202) 677-6229

Multiple Myeloma Group
This group is open to multiple myeloma patients, survivors, and caregivers. Meetings feature speakers as well as education and support. Please call to register.

Fourth Thursday each month, 5:30–6:30 pm
MFA, Katzen Center board room
Facilitator: Jennifer Bires, LICSW, (202) 741-2218

Nutrition Club
First Monday each month, noon–1 pm
MFA, Katzen Center board room
Facilitator: Jennifer Leon, (202) 741-6489

Prostate Cancer Educational Group
This group is free and open to patients, survivors, and caregivers.
Second Tuesday each month, 6–7:30 pm
MFA, first floor, 1-402
Facilitator: Lindsay Blair, M.S.W., (202) 677-6229

Restorative Yoga
This group introduces patients and caregivers to the physical and emotional benefits of yoga.
Tuesdays, 5–6 p.m., GW Marvin Center, Fifth floor activities room 800 21st St., N.W.
Facilitator: Jennifer Bires, LICSW, (202) 741-2218

Survivorship Series
A monthly educational speaker series.
Second Thursday each month, 11:45 am–12:45 pm
MFA, Katzen Center board room
Facilitator: Lindsay Blair, M.S.W., (202) 677-6229

Washington, D.C. Metropolitan Area
Brain Tumor Support Group
This group is open to patients/survivors with brain tumors and their caregivers. Outside professional speakers provide discussion on key topics.
First Thursday each month, 6:30–8:30 pm
MFA, Katzen Center board room
Facilitator: Jennifer Bires, LICSW, (202) 741-2218

Young Adult Group
Young adults (19 to 39 years of age) who are currently in treatment or are cancer survivors may attend this structured discussion group facilitated by two social workers.
Third Sunday of each month, 5–6:30 pm
The Charles E. Smith Center 600 22nd St., N.W.
Facilitator: Jennifer Bires, LICSW, (202) 741-2218

For more information about these support groups and other supportive services:
Jennifer Bires, L.I.C.S.W.
(202) 741-2218
jbires@mfa.gwu.edu

This report is produced by the George Washington University School of Medicine and Health Sciences’ Department of Communications and Marketing. Cancer registry data compiled and prepared by Hong Nguyen, M.P.H., C.T.R., Nhiha Than, and Patricia Morgan with the George Washington University Hospital.
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Chair/GW Cancer Program

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Chief of Breast Surgery
Physician Liaison/GW Cancer Program

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GW's Cancer Program is affiliated with the services of the GW Cancer Institute, GW Hospital, the GW Medical Faculty Associates, GW's School of Medicine and Health Sciences, and the Dr. Cyrus and Myrtle Katzen Cancer Research Center.