2016

WATSON CLINIC LLP
Cancer & Research Center

ANNUAL REPORT

Leading the Way in the BATTLE AGAINST CANCER

Since 2003, we've worked to redefine the future of cancer care for patients and families throughout Polk County and beyond.

The foundation of any successful enterprise is people. We've dedicated ourselves to recruiting only the most talented and forward-thinking medical talents from all over the world. These cancer fighting specialists possess expertise in a number of fields, including oncology-hematology, radiation oncology, surgical oncology and gynecologic oncology. Watson Clinic's extended family of over 220 board-certified specialists provides additional support from fields as diverse as gastroenterology, plastic & reconstructive surgery and primary care.

Our specialists are equipped with the most advanced technologies available; in fact, our cancer center is frequently the first to introduce many of these tools to our area. Technologies like the TrueBeam™ linear accelerator, the Trilogy linear accelerator, open-bore 3-Tesla MRI, PET/CT scan systems and 3D mammography allow us to diagnose and treat cancer with greater precision and less invasion than ever before, and they've proven essential in our quest to consistently improve overall patient outcomes.

The future of cancer care is also powered by the promise of tomorrow's discoveries. That's why we've remained on the frontline of the latest research through our Center for Research, and enroll our cherished patients in the most promising evidence-based clinical trials. Meanwhile, our status as the area's only member of the Moffitt Oncology Network affords our patients unfettered access to additional clinical trials and technologies as an extension to what we offer in-house.

Our efforts have made an impact in our own community, and resounded throughout the larger oncology landscape as well. Recently, we achieved a highly coveted 3-year reaccreditation from the American College of Surgeons Commission on Cancer, and we were also Florida's sole recipient of the 2016 Outstanding Achievement Award from that same prestigious organization.

Finally, and most profound, our cancer center represents a safe and comforting haven for all who seek treatment here; a place that promotes healing, compassion, camaraderie and a strong sense of empowerment. Patients often seek our care during the most vulnerable and uncertain moments of their lives. In order to ensure their complete recovery, our efforts must transcend the mere nuts and bolts of practical medicine. To this end, our medical providers, social workers, nurse navigators, educators and additional support team members engage in the nourishment of each patient's physical and emotional well-being. Throughout the pages of this report, you'll find a series of deeply felt reflections and insights from just a few of our cherished patients.

It is our honor to advocate on behalf of our patients and their families, and to advance the cause of cancer survivorship for this and future generations.

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A Message from LUIS FRANCO, MD

Cancer Committee Chair

> *We treat the entire patient, not just their tumor.”*

We want to thank our community for the support that we receive through the cancer outreach events, attendance to fund raising events in cooperation with the American Cancer Society.

We, at the Watson Clinic Center for Cancer and Research, feel a great responsibility to continuously improve our performance and delivery of care to our patients and their families.

In 2015, we had 907 new cancer patients, which we were honored to care for. We completed our fourth survey with the Commission on Cancer and for the second consecutive time, our cancer center received the Gold Medal award which is the highest standard that the Commission on Cancer credits; this is given to very few institutions, among the 1,500 centers that pursue accreditation every three years. This high standard made us the only recipient of this high honor in the state of Florida and the only free-standing facility (not backed by hospital systems) in the U.S. A. to achieve this.

State of the art cancer care continues to evolve due to advances in all aspects of cancer treatment. Cancer prevention with implementation of low dose CT scan of the lungs for chronic smokers at risk of developing lung cancer, to the more aggressive use of diagnostic colonoscopies, annual mammograms and to the more comprehensive follow-ups through the department of Internal Medicine and Family Practice. The development of stricter guidelines to fight Class 2 and Class 3 obesity and the education that implies to make patients realize that this fight is important to win, not only for our cardiac patients but for healthier individuals in order to decrease their risk of developing cancers. We are also proud to offer systemic therapies, molecular targeted therapies, immunotherapy and other biotechnological strategies into treatment paradigms.

Through this annual report, we will present you a summary of the efforts that our clinical oncologists, surgical oncologists, radiation oncologists, supportive consultants can deliver in order to achieve the best care that we can deliver, backed by our last College of Surgery Accreditation. These efforts are also provided by our oncology nurses, social services and administrative personnel who also play a key role in the delivery of excellence of care.

We welcome your feedback on questions and ideas for collaboration and perhaps, for the future development of cancer support to our population in need.

A Message from

SHALINI MULAPARTHI, MD

Cancer Liaison Physician

It is my privilege to communicate with you through our annual report from the Watson Clinic Cancer & Research Center. We have experienced another exciting year, during which we have continued to implement the latest advancements in cancer prevention. Improving the early detection of colon cancer was our major goal, and we worked diligently to conduct stool FIT tests and raise awareness in primary health for screening colonoscopies. Additional early detection efforts include new CT scans for lung cancer screening; we have a data base to follow and eventually we will publish people diagnosed with cancer.

On a global level , cancer is now one of the world's most pressing health challenges. The scientific community is working hard to avert this grim projection.

Clinical research is the bedrock of progress against cancer and discoveries moving from bench to bedside faster than ever can achieve our goal of controlling cancer. The best example is the explosion of immunotherapy approved for a variety of cancers. From the success of immunotherapy in advanced melanoma now immunotherapy is used in lung, head and neck, renal and bladder cancer.

Research continues to deliver new and improved treatment options for thousands of people living with cancer. Between October 2014 and October 2015 the FDA approved 10 new cancer treatments and a new cancer prevention vaccine. These included three immunotherapies, blinatumomab, nivolumab and dinutuximab and five novel targeted drugs olaparib, palbociclib, lenvoitinib, panobinostat and sonidegib.

Precision medicine is shaping up to become a mainstream treatment approach for many types of cancer. Our understanding of tumor biology and the molecules that make tumors grow and spread is rapidly expanding. Due to building this knowledge, promising new targeted therapies have emerged to treat blood, ovarian, breast and kidney cancers.

At Watson Clinic, cancer care is focused on whole patient needs, which not only includes clinical needs, but also physical emotional, psychological and spiritual needs. This is achieved in collaboration with non-physician and physician practitioners that includes Radiology, Pathology, Surgical Oncology, Radiation Oncology and Gynecologic Oncology. We have weekly multidisciplinary tumor board conferences to discuss cases and provide exceptional care plans. We have achieved the Outstanding Achievement Award from the CoC with seven commendations as the only free standing facility in Florida. We expect several successful years ahead in eradicating cancer.

Outreach and EVENTS

The Watson Clinic Foundation, Watson Clinic LLP and the Watson Clinic Cancer & Research Center have long been advocates for improving health in our community, and empowering people to make their personal health a priority. Through one-on-one physician engagement, social media platforms and assorted media outlets, we've spread the word on valuable free screenings and topics related to healthcare education.

It is our central mission to aid communities in the prevention of life-threatening and chronic health conditions, provide insight into the innumerable treatment options that are available and ever-changing, and talk about the latest advances in research, which are so critical to finding cures.

Additionally, we make every effort to provide culturally appropriate community health programs and screenings to those most in need.

The pages of this annual report do not allow adequate room to list every program and event we've conducted in the past year, but the following highlights will provide a brief glimpse into this impactful work:

- ***Conducted free skin cancer screenings at locations in both Hillsborough and Polk counties.***
- ***Hosted a colon cancer education program for young professionals that included discussion about the importance of early screening. Participants were given a fecal occult test to take home, which were tested free of charge.***
- ***Our medical professionals served as speakers for numerous community organizations as part of a continuation of focus on education.***

At Watson Clinic, we recognize that we can serve a vital function in the lives of the people we serve. We take that responsibility very seriously and will always work tirelessly to ensure a healthy and thriving community.

I would definitely recommend the Watson Clinic Cancer & Research Center... They've made a rough situation a better one. You build a relationship with everyone that's worked with you. I feel like they're family here.

– Michele Dail
Breast Cancer Survivor

Oncology
SOCIAL SERVICES

Many people ask oncology social workers, "What do you do?" Social workers are educated and skilled to assist with the psychological, social, emotional, and spiritual issues that people experience when facing a cancer diagnosis. We are there to help people with practical needs, find resources to navigate such a complex diagnosis, assist with transitions and decision-making, navigate cultural issues, communicate with family members, friends, and healthcare providers, as well as provide support while adjusting to your cancer diagnosis.

The general emotional and physical needs of a patient can vary, depending on the type and stage of cancer, their unique ability to cope and adjust to a potentially life limiting illness. In recent years the implementation of distress screening at a patient's first oncology visit has allowed an introduction between patients and social workers at an earlier stage in the treatment process. Introductions have led to earlier interventions resulting in better quality of life throughout the patient's cancer journey.

Sometimes the intervention is just being present for the patient during an overwhelming process and life changing event known as cancer. Oncology social workers provide a non-judgmental setting for people to share their struggles, fears, joys, strengths and weaknesses.

Walking the cancer journey with patients is a privilege. Each patient has a unique story. Since cancer does not discriminate we work with patients of varying socioeconomic statuses, cultures, races, religions, ethnicities and their distinctive coping styles. Many patients' "life perspective" will change during their journey. It is an amazing transformation to witness. Enjoying every day because life can be too short is just one of the precious gifts patients unknowingly give to us every day.

Arts in MEDICINE

Healing Through Creative Expression

ARTS IN MEDICINE

The quest to nurture the health of the body and spirit during cancer treatment is all-encompassing. It calls upon the skills of many compassionate specialists across a broad spectrum of disciplines. Beyond the employment of physical therapies, surgery, chemotherapy, radiation and medication regimens, we must offer support systems that help ease the emotional strife that a cancer journey can inflict upon each patient and their family members.

Arts in Medicine provides a system of support. Sponsored by the Watson Clinic Foundation, this inspirational program provides an opportunity to connect and heal through engagement in the creative arts.

The program is brought to life by a group of musicians, artists, crafters, performers and educators – all volunteers – who join with patients and family members on the Watson Clinic Cancer & Research Center campus. They collaborate on various forms of creative expression, including painting and music.

Why is Arts in Medicine so crucial during the treatment process? Research shows that creative outlets reduce anxiety in patients with cancer and blood disease, create an environment that is more conducive to physical and psychological healing, raise circulating endorphins and natural cancer-fighting cell levels, and enhance pain thresholds.

Patients and their family members have enjoyed a more positive perspective of their journey through their involvement in the program, and a more calming and pleasurable sense of self in the process.

Arts in Medicine has proven tremendously beneficial, motivational and life-affirming for many of our patients. For this reason, we hope to engage in these creative arts therapies for many years to come.

Cancer COMMITTEE

Cancer Committee Physician Members

Dr. John Barrett, Radiation Oncology

Dr. Elisabeth Dupont, Breast Surgery

Dr. Luis Franco, Oncology-Hematology, Chairman

Dr. Edward Garcia, Pathology

Dr. Howard Gorell, Radiology

Dr. Thomas Moskal, Surgical Oncology

Dr. Shalini Mulaparthi, Oncology-Hematology, Cancer Liaison Physician

Dr. Sandra Sha, Radiation Oncology

Dr. Galina Vugman, Oncology-Hematology

Physician-Associate Members

Dr. Richard Cardosi, Gynecologic Oncology

Dr. Jens Carlsen, Urology

Dr. Tim Dickason, Pathology

Dr. Randy Heysek, Radiation Oncology

Dr. Scott Kelley, General Surgery/Surgical Oncology

Dr. David Lowry, Radiology

Dr. Neeharika S. Makani, Oncology-Hematology

Dr. Jack Thigpen, General Surgery

Activity Coordinators

Cauney Bamberg, Director Watson Clinic Foundation, Community Outreach

Cindy Bruton, Sr. Administrative Assistant, Cancer Conference

Monique Hakins, MSW, Social Services, Psychosocial Services

Helen Lewis, BS, CTR, Cancer Registry Quality

Noreen McGowan, BSN, CCRC, Director Clinical Research

Debra Hemm, RN, OCN, Chemotherapy/Oncology, Nurse Navigator, Quality Improvement

Non-Physician Members

Mary Ann Blanchard, RN, BS, Director Clinical Services

Mashell Hooker, RN, OCN, Chemotherapy Charge Nurse

Jerri Huntt, MSW, LCSW, Women's Center Social Services

Aiman Kumha, MBA, Director Clinical Services

Ann Lehman, BSW, Cancer & Research Center Social Services

Carol Martin, RN, Women's Center, Clinical Services Coordinator

Stephanie McLean, American Cancer Society, Area Patient Representative

Jennifer Snider, CTR, Cancer Program Coordinator

Shirley Willis, ARNP-C, Cancer & Research Center, Clinical Services Coordinator

Jie Yang, PhD, DABR, Radiation Physicist

Nurse Committee REPORT

When you're a nurse you know that every day you will touch a life or a life will touch yours.

This is Oncology nursing. Our patients are our passion. As a nurse, we know every life is precious and no matter where the road in nursing care goes, the journey is the same.

The oncology nurses at the Watson Clinic Cancer & Research Center combine compassion, knowledge and skill to walk along side every patient that steps through our doors.

Our nursing team advocates for the treatment of the entire patient, not just their disease. We strive to see our patients living a full life in spite of having cancer.

"Cancer treatment has come so far. The new drugs and protocols are more patient friendly, I guess you could say. Patients are able to work and live full lives while going through treatment….and as a nurse that makes us happy."

Our nurses strive to stay current on chemotherapy drugs and protocols by obtaining Oncology certification every four years and Chemotherapy/Biotherapy certification every two years.

The nurse committee at our cancer center consists of an oncology manager, chemotherapy team leader, nurse navigator and an occasional chemotherapy nurse to monitor, evaluate and improve current processes, thus increasing the safety and quality of patient care. We support the entire staff (certified medical assistants, schedulers and receptionists) with annual and quarterly classes, emergency drills and skills review to ensure that everyone is prepared to care for our patients at the highest level.

The future is bright in the world of Oncology. Researchers are turning out new drugs at a rapid pace.

"I really feel we are on the verge of something wonderful in the world of cancer treatment. And I thank God every day that we can be a part of making a difference in the lives of our patients. The one thing we want our community to know is our cancer center may be located in a small town, but you will receive top of the line treatment, with care and love from all staff members."

Just because you've been diagnosed with cancer doesn't mean it's the end of your life. You make it what you want to make it.

– Carol Vonesh
Ovarian Cancer Survivor

Nurse NAVIGATION

The Oncology Nurse Navigator not only provides assistance to patients, but also to their families and caregivers from pre-diagnosis through all phases of the cancer experience.

Survivorship Care Planning is a specific approach taken to address the long term needs of cancer survivors. It includes monitoring and managing long term effects and health promotion. Survivorship care begins the moment of cancer diagnosis and provides a better continuity of care by planning for the post-treatment phase.

As a result of advances in cancer diagnosis and treatment, now more than ever, patients are surviving cancer. Cancer survivors are not all the same therefore their needs vary. There are those with few long term effects from their treatments to patients with chronic conditions or health issues. All survivors require education regarding their health risks and screening needs. Care plans allow patients to be informed regarding their diagnosis, treatment history, risk of developing long term side effects, future screening recommendations as well as health maintenance. Our Nurse Navigator meets with patients once treatment is completed to review their personal care plan as well as provide a copy for their records.

At the Watson Clinic Cancer & Research Center our Nurse Navigator teaches chemotherapy education classes three times a week for all patients starting chemotherapy. The class consists of instructions using not only a Power Point presentation on how the chemotherapy treatment process works, but also provides written literature for future reference. The classes are offered in the morning, noon and afternoon for patient convenience.

Our Nurse Navigator works closely with Informed DNA, a telephonic genetic counseling organization. She coordinates the genetic counseling referrals and arranges any testing that is ordered through them for our high-risk patients.

Our patients have comfort in knowing that if they need help with any aspect of care, they can contact our nurse navigator and she will do everything within her power to help that patient or find someone who can.

Center for RESEARCH

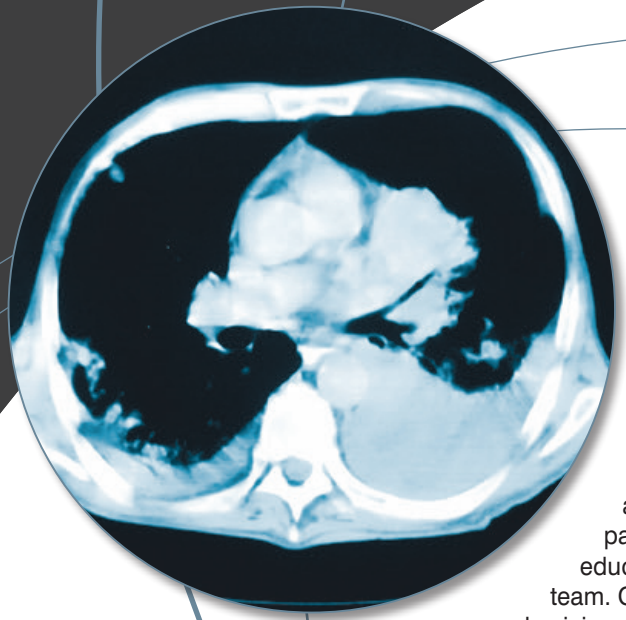
Watson Clinic center for RESEARCH INC.

Clinical trials are available at the Watson Clinic Cancer & Research Center. Our oncology patients are screened daily to determine their eligibility for an open clinical trial. Our hope is that many patients will be enrolled into clinical trials that will improve their clinical outcome. By volunteering for a clinical trial, a patient can obtain access to new medicines that will combat their serious cancer diagnosis.

The Watson Clinic Cancer & Research Center is involved in numerous trials that focus on treating patients diagnosed with breast, colon, lung, leukemia, lymphoma, melanoma, pancreatic and prostate cancers. This year's trials are sponsored by the National Cancer Institute, medical universities and the pharmaceutical industry.

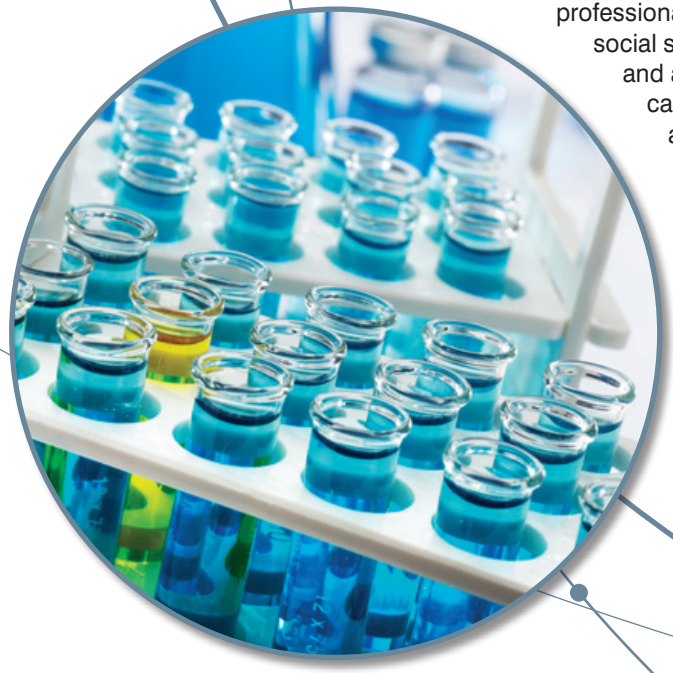
The new growing understanding of cancer biology has demanded that clinical trials begin to evolve. Trials are now designed to attempt to match specific drugs with specific biology. Many new medicines are being studied to treat certain genetic mutations. One of these trial designs is called the "Basket Trial Design." Patients are asked to provide a piece of their tissue for laboratory analysis. If a genetic mutation is detected, the new targeted investigational drug can be administered to the patient. The patient will be carefully followed by their physician to assess clinical improvement. The objective of these trials is to assess the effect of an investigational drug on the patient's specific biologic mutation. Our research team works in collaboration with the Moffitt Cancer Center to identify trials that will best fit our cancer patients.

Our research infrastructure comprises medical oncologists, radiation oncologists, pathologists, radiologists and surgeons. The team reviews all available trial opportunities and determines if a trial is feasible to recruit new patients. Every patient has his or her own specific blueprint and is unique. All patients will undergo specific treatment regimens that best meet their needs. The team chooses a trial that is appropriate for that specific patient and tailors the management of the trial to that patient. The physicians stay abreast of the latest developments and seek out participation in trials that will be geared toward meeting the community's needs.



Cancer CONFERENCES

Cancer conferences not only serve as a forum for prospective review of cancer cases, involving a multidisciplinary team in the patient care process, but also offers education for the physicians and care team. Our multidisciplinary team includes physicians in the departments of medical oncology-hematology, radiation oncology, surgical oncology, pathology, diagnostic radiology, and other specialties, as well as allied health professionals from research, nursing, social services, cancer registry and administration. They attend cancer conferences three times a week for collaborative discussions of diagnosis, stage, prognostic factors, and national treatment guidelines pertaining to the cases presented and cancer related educational activities.



Year End 2015

Total # of Cancer Conferences..... 95

Total # of Cases Presented
(89% of Analytic Caseload) 804

Total # of Cases Presented Prospectively
(100% of Cases Presented) 802

Total # of Cancer Related Educational Activities.... 20

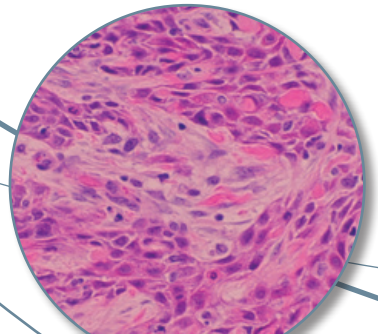
YTD July 31, 2016

Total # of Cancer Conferences..... 59

Total # of Cases Presented
(53% of Analytic Caseload) 474

Total # of Cases Presented Prospectively
(100% of Cases Presented) 473

Total # of Cancer Related Educational Activities.....11



Activity REPORT

Cancer registrars capture a complete summary of patient history, diagnosis, staging of disease, treatment, and annual follow-up (lifetime for all analytic cases) for every cancer patient in the United States, and other countries as well. Cancer registries are required by state statute and federal law to report cancer cases. The data collected is submitted to the Florida Cancer Data Systems (FCDS) and National Cancer Data Base (NCDB) the data is used for research, outcome measurements, statistics, and educating the public.

FCDS – Florida Cancer Data System is the state registry for Florida and is located at the University of Miami.

NCDB – National Cancer Data Base is the national data base registry located in Chicago IL, a joint program of the ACoS (American College of Surgeons and the Commission on Cancer).

Cancer registrars and follow-up data analysts are educated in anatomy and physiology, medical terminology, disease process, staging process, oncology treatments; also trained in all state and national guidelines. The registry team is responsible for maintaining 10 CoC standards with four standards being commendation. The cancer registry collects and maintains data for the Watson Clinic Cancer & Research Center (WCCRC) and Watson Clinic.

Cancer Registry Team

Paula Buck, CTR, Abstractor

Laura Broderick, CTR, Abstractor

Aprill Rease, CTR, Abstractor

Evelyn Gorman, BAS, CCRC, CTR, Abstractor

Helen Lewis, BS, CTR, Lead Abstractor

Valerie Roberts, Follow-Up Data Specialist

Jennifer Snider, CTR, Cancer Program Coordinator

The following series of tables and graphs demonstrate an overview of the data and information recorded in the cancer registry database:

Table 1: Total 2015 Cases for Watson Clinic Cancer & Research Center

Primary Site	Total	Analytic	Non-Analytic & Class of Case 30	Male	Female
All Sites	**1100**	**756**	**344**	**472**	**628**
Lip	0	0	0	0	0
Tongue	12	9	3	7	5
Oropharynx	3	1	2	2	1
Hypopharynx	1	1	0	1	0
Other Oral Cavity	14	8	6	8	6
Esophagus	13	10	3	13	0
Stomach	11	9	2	7	4
Colon	68	33	35	33	35
Rectum	17	13	4	9	8
Anus/Anal Canal	1	1	0	0	1
Liver	15	6	9	11	4
Pancreas	22	16	6	9	13
Other Digestive System	15	6	9	5	10
Nasal/Sinus	1	1	0	1	0
Larynx	7	5	2	5	2
Other	1	0	1	1	0
Lung/Bronc-Small Cell	26	25	1	13	13
Lung/Bronc-Non Small Cell	95	71	24	47	48
Other Bronchus & Lung	8	6	2	4	4
Leukemia	51	35	16	30	21
Multiple Myeloma	9	8	1	4	5
Other Blood & Bone Marrow	31	22	9	17	14
Bone	0	0	0	0	0
Connect/Soft Tissue	3	1	2	2	1
Melanoma	54	25	29	30	24
Other Skin	6	3	3	5	1
Breast	300	249	51	2	298
Cervix Uteri	11	10	1	0	11
Corpus Uteri	17	12	5	0	17
Ovary	17	16	1	0	17
Vulva	1	0	1	0	1
Other Female Genital	3	3	0	0	3
Prostate	125	62	63	125	0
Testis	6	4	2	6	0
Other Male Genital	1	0	1	1	0
Bladder	29	12	17	19	10
Kidney/Renal	15	6	9	12	3
Other Urinary System	2	2	0	1	1
Brain (Benign)	0	0	0	0	0
Brain (Malignant)	9	6	3	5	4
Other Brain & CNS	5	1	4	1	4
Thyroid	3	0	3	0	3
Other Endocrine	0	0	0	0	0
Hodgkin's Disease	4	2	2	2	2
Non-Hodgkin's	56	47	9	31	25
Unknown Primary	8	6	2	2	6
Other/Ill-Defined	4	3	1	1	3

Class of Case:

- Analytic (Class 00-22) – Diagnosed and/ or received first- course cancer treatment at the reporting facility. Reported to NCDB (CoC) and FCDS.
- Class 30 – Newly diagnosed cancer case first diagnosed and all first - course treatment elsewhere, the reporting facility was part to the diagnostic and staging workup. Reported to FCDS only.
- Non-Analytic (Class 31-37) – Diagnosed and all first – course treatment elsewhere, patient is seen for persistent disease or recurrences. Reported to FCDS only.

ACoS – American College of Surgeons CoC – Commission on Cancer.

NCDB (CoC) – National Cancer Data Base.

FCDS – Florida Cancer Data System (State Cancer Registry).

Table 2: Total 2015 Cases for Watson Clinic LLP

Primary Site	Total	Analytic	Non-Analytic & Class of Case 30	Male	Female
All Sites	**1955**	**1275**	**680**	**916**	**1039**
Lip	1	1	0	0	1
Tongue	13	6	7	9	4
Oropharynx	2	1	1	2	0
Hypopharynx	1	0	1	1	0
Other Oral Cavity	12	3	9	9	3
Esophagus	13	3	10	12	1
Stomach	10	4	6	5	5
Colon	73	6	67	31	42
Rectum	18	2	16	9	9
Anus/Anal Canal	2	0	2	1	1
Liver	6	1	5	2	4
Pancreas	19	2	17	9	10
Other Digestive System	11	1	10	5	6
Nasal/Sinus	1	0	1	1	0
Larynx	10	0	10	7	3
Other	1	0	1	1	0
Lung/Bronc-Small Cell	22	7	15	11	11
Lung/Bronc-Non Small Cell	105	28	77	49	56
Other Bronchus & Lung	5	1	4	1	4
Leukemia	31	16	15	19	12
Multiple Myeloma	3	0	3	2	1
Other Blood & Bone Marrow	13	3	10	6	7
Bone	0	0	0	0	0
Connect/Soft Tissue	3	3	0	1	2
Melanoma	638	602	36	377	261
Other Skin	11	9	2	9	2
Breast	338	245	93	2	336
Cervix Uteri	15	7	8	0	15
Corpus Uteri	61	20	41	0	61
Ovary	21	8	13	0	21
Vulva	10	4	6	0	10
Other Female Genital	5	2	3	0	5
Prostate	179	141	38	179	0
Testis	3	1	2	3	0
Other Male Genital	6	3	3	6	0
Bladder	62	30	32	49	13
Kidney/Renal	29	12	17	21	8
Other Urinary System	3	0	3	2	1
Brain (Benign)	7	4	3	4	3
Brain (Malignant)	15	4	11	5	10
Other Brain & CNS	35	27	8	8	27
Thyroid	32	24	8	5	27
Other Endocrine	29	16	13	11	18
Hodgkin's Disease	4	0	4	2	2
Non-Hodgkin's	60	23	37	34	26
Unknown Primary	14	4	10	5	9
Other/Ill-Defined	3	1	2	1	2

Table 3: Newly Diagnosed 2015 Cases for Watson Clinic Cancer & Research Center

		Class of Case		Gender		TNM Stage at Diagnosis						
Primary Site	Total	Analytic (Class 00-22)	Class 30	Male	Female	0	I	II	III	IV	Unknown	N/A
All Sites	**907**	**756**	**151**	**364**	**543**	**55**	**269**	**182**	**124**	**133**	**53**	**91**
Oral Cavity	**24**	**19**	**5**	**16**	**8**	**0**	**4**	**3**	**4**	**9**	**2**	**2**
Lip	0	0	0	0	0	0	0	0	0	0	0	0
Tongue	12	9	3	7	5	0	0	2	2	8	0	0
Oropharynx	1	1	0	1	0	0	0	0	0	0	1	0
Hypopharynx	1	1	0	1	0	0	1	0	0	0	0	0
Other	10	8	2	7	3	0	3	1	2	1	1	2
Digestive System	**134**	**94**	**40**	**71**	**63**	**4**	**17**	**26**	**31**	**44**	**12**	**0**
Esophagus	11	10	1	11	0	0	1	0	1	6	3	0
Stomach	10	9	1	6	4	0	0	2	2	3	3	0
Colon	53	33	20	27	26	1	6	15	17	13	1	0
Rectum	17	13	4	9	8	2	2	4	4	3	2	0
Anus/Anal Canal	1	1	0	0	1	0	1	0	0	0	0	0
Liver	11	6	5	7	4	0	2	1	4	3	1	0
Pancreas	19	16	3	8	11	0	1	4	1	12	1	0
Other	12	6	6	3	9	1	4	0	2	4	1	0
Respiratory System	**127**	**108**	**19**	**65**	**62**	**0**	**37**	**4**	**35**	**46**	**4**	**1**
Nasal/Sinus	1	1	0	1	0	0	0	0	0	1	0	0
Larynx	5	5	0	3	2	0	2	1	1	1	0	0
Other	1	0	1	1	0	0	0	0	1	0	0	0
Lung/Bronc-Small Cell	25	25	0	13	12	0	1	0	9	14	1	0
Lung/Bronc-Non Small Cell	87	71	16	43	44	0	31	3	23	27	3	0
Other Bronchus & Lung	8	6	2	4	4	0	3	0	1	3	0	1
Blood & Bone Marrow	**75**	**65**	**10**	**42**	**33**	**0**	**1**	**1**	**1**	**1**	**2**	**69**
Leukemia	43	35	8	26	17	0	1	1	1	1	2	37
Multiple Myeloma	8	8	0	3	5	0	0	0	0	0	0	8
Other	24	22	2	13	11	0	0	0	0	0	0	24
Bone	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Connect/Soft Tissue	**2**	**1**	**1**	**1**	**1**	**0**	**0**	**1**	**1**	**0**	**0**	**0**
Skin	**39**	**28**	**11**	**22**	**17**	**8**	**17**	**4**	**3**	**2**	**5**	**0**
Melanoma	35	25	10	19	16	8	15	4	2	2	4	0
Other	4	3	1	3	1	0	2	0	1	0	1	0
Breast	**267**	**249**	**18**	**2**	**265**	**42**	**136**	**59**	**14**	**3**	**13**	**0**
Female Genital	**44**	**41**	**3**	**0**	**44**	**0**	**14**	**6**	**16**	**4**	**3**	**1**
Cervix Uteri	10	10	0	0	10	0	3	1	3	3	0	0
Corpus Uteri	14	12	2	0	14	0	8	1	2	0	2	1
Ovary	17	16	1	0	17	0	2	3	10	1	1	0
Vulva	0	0	0	0	0	0	0	0	0	0	0	0
Other	3	3	0	0	3	0	1	1	1	0	0	0
Male Genital	**93**	**66**	**27**	**93**	**0**	**0**	**26**	**54**	**4**	**6**	**3**	**0**
Prostate	88	62	26	88	0	0	23	53	3	6	3	0
Testis	5	4	1	5	0	0	3	1	1	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0
Urinary System	**26**	**20**	**6**	**17**	**9**	**1**	**7**	**9**	**5**	**3**	**1**	**0**
Bladder	16	12	4	10	6	1	3	9	2	1	0	0
Kidney/Renal	8	6	2	6	2	0	3	0	2	2	1	0
Other	2	2	0	1	1	0	1	0	1	0	0	0
Brain & CNS	**10**	**7**	**3**	**4**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**10**
Brain (Benign)	0	0	0	0	0	0	0	0	0	0	0	0
Brain (Malignant)	7	6	1	4	3	0	0	0	0	0	0	7
Other	3	1	2	0	3	0	0	0	0	0	0	3
Endocrine	**1**	**0**	**1**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
Thyroid	1	0	1	0	1	0	1	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0
Lymphatic System	**54**	**49**	**5**	**29**	**25**	**0**	**9**	**15**	**10**	**13**	**7**	**0**
Hodgkin's Disease	2	2	0	1	1	0	1	1	0	0	0	0
Non-Hodgkin's	52	47	5	28	24	0	8	14	10	13	7	0
Unknown Primary	**7**	**6**	**1**	**1**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**7**
Other/Ill-Defined	**4**	**3**	**1**	**1**	**3**	**0**	**0**	**0**	**0**	**2**	**1**	**1**

Class of Case:

- Analytic (Class 00-22) – Diagnosed and/ or received first- course cancer treatment at the reporting facility. Reported to NCDB (CoC) and FCDS.
- Class 30 – Newly diagnosed cancer case first diagnosed and all first - course treatment elsewhere, the reporting facility was part to the diagnostic and staging workup. Reported to FCDS only.
- Non-Analytic (Class 31-37) – Diagnosed and all first – course treatment elsewhere, patient is seen for persistent disease or recurrences. Reported to FCDS only.

ACoS – American College of Surgeons
CoC – Commission on Cancer.

NCDB (CoC) – National Cancer Data Base.

FCDS – Florida Cancer Data System (State Cancer Registry).

Total: Newly diagnosed analytic cases class 00-22 and class 30's.

Unknown: unknown stage, case not able to be staged.

N/A: not applicable for staging, no AJCC staging form for this cancer site and histology combination.

AJCC – American Joint Committee on Cancer: Cancer staging guidelines.

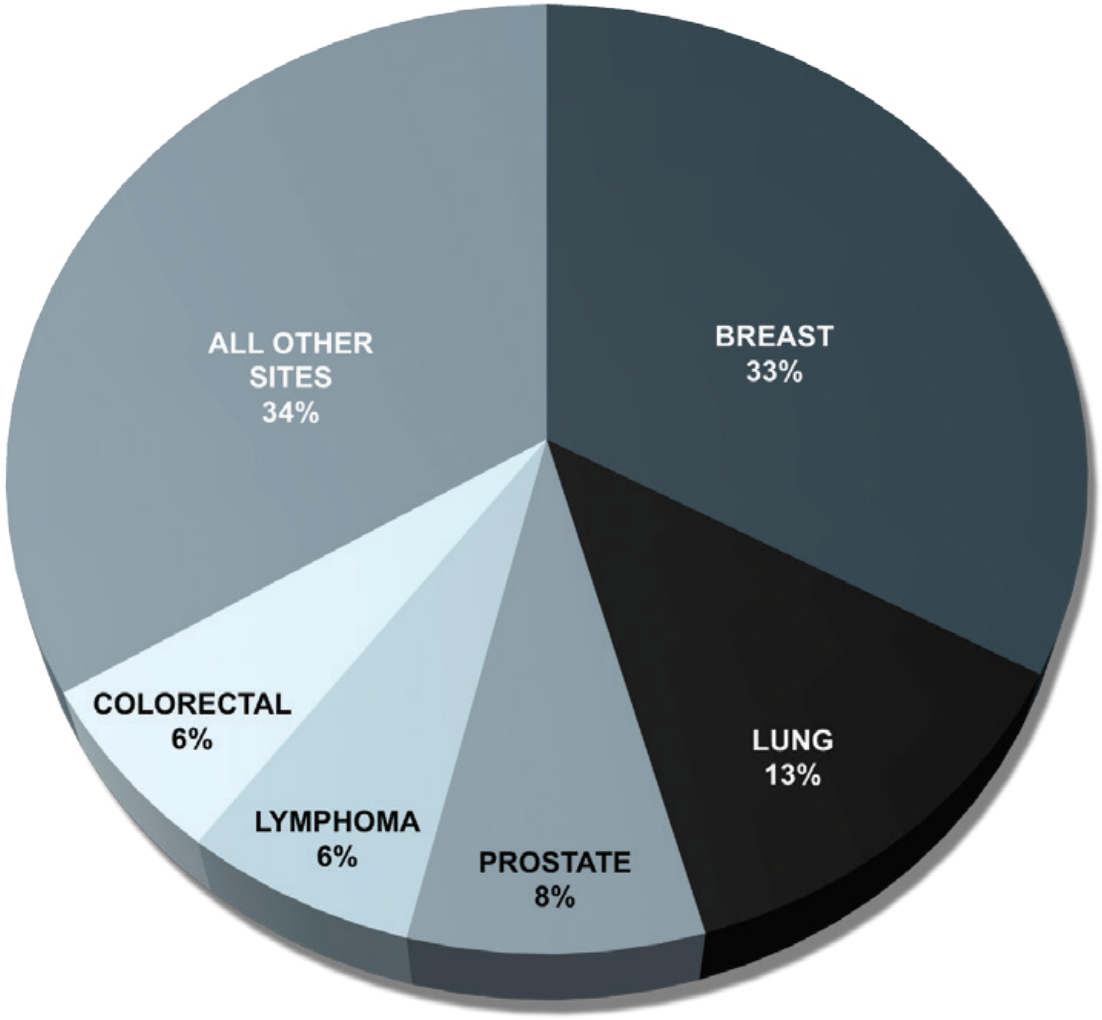
T: Primary tumor size and extent of tumor.

N: Regional lymph nodes.

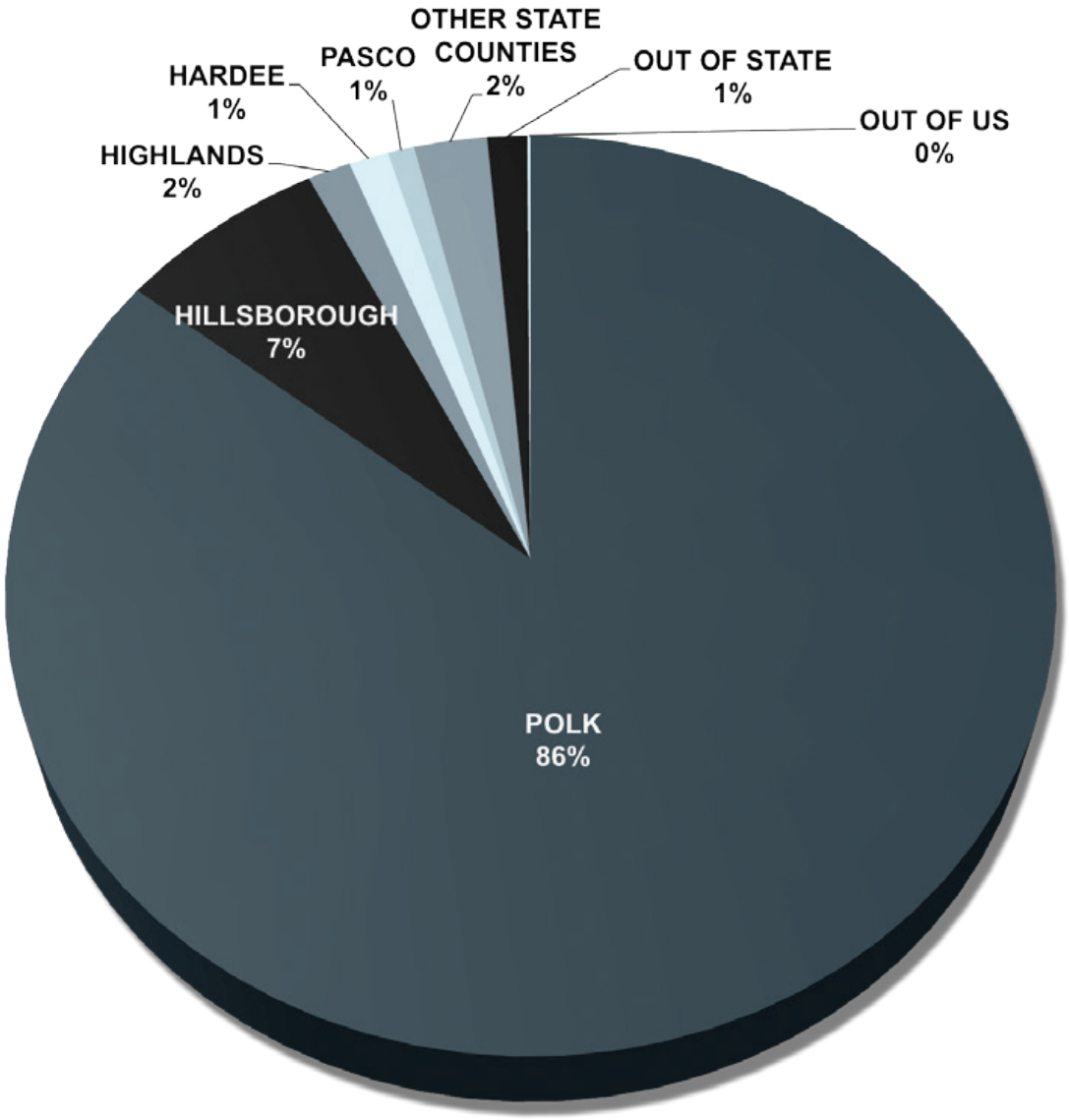
M: Presence or absence of distant metastasis.

TNM Group Summary Stage: based on the combination of T, N, M and sometimes other prognostic factors for an overall stage.

Watson Clinic Cancer & Research Center
Top Five Newly Diagnosed Sites for 2015



Watson Clinic Cancer & Research Center
County of Residence at Diagnosis for 2015



STUDY:

Retrospective Study of Nutritional Status in Patients with Head and Neck, Rectal, Anal, Lung, Esophageal and Pancreatic Cancers

Shalini Mulaparthi, MD, Principal Investigator
Neha Shah, BA, Student Researcher

Introduction:

Concurrent chemoradiation (CRT) is beneficial in locally advanced cancers, such as head and neck, rectal, anal, lung, esophageal, or pancreatic cancers. For example, CRT used in advanced head/neck cancer patients is an effective method to preserve organ function (Paccagnella et al., 838).

CRT is not without side effects, however. One of the more significant consequences is the deterioration of a patient's nutritional status. Patients receiving this form of therapy have an associated higher certainty of malnutrition and significant weight loss. As a result of the radiosensitizing effects of CRT, patients can experience severe mucositis, odynophagia, dysphagia, loss of appetite, weight loss of 10% of body weight or more, nausea/vomiting, or diarrhea related symptoms. Moreover, severe malnutrition can halt therapy, thereby reducing its efficacy, or result in longer hospital stays or a diminished quality of life (Paccagnella et al., 838).

One of the main objectives of supportive nutritional therapy is to continuously prevent cachexia and weakness in patients throughout their treatment (Senft et al., 272). Addressing the nutritional status in patients receiving chemoradiation therapy is extremely important in preventing significant weight loss or hospitalizations from treatment related complications.

Methodology:

Patients

A list of patients undergoing concurrent chemoradiation with head/neck, rectal/anal, lung/esophageal or pancreatic cancers during January 1, 2013, through December 31, 2015, was provided by the Watson Clinic Cancer & Research Center – Cancer Registry. Data abstraction was conducted from currently existing Watson Clinic medical records. HIPAA guidelines for research confidentiality were followed to protect study patient information, and IRB approval was received for the study.

A retrospective chart review of 100 study patients was viewed over three years. A total of 39 head/neck cancer patients, 19 rectal and anal cancer patients, 40 lung and esophageal cancer patients, and 2 pancreatic cancer patients, all receiving concurrent chemoradiation therapy, were reviewed. Due to the low volume of pancreatic cancer patients observed during this time frame receiving concurrent chemoradiation, those two patients were excluded from the study.

Significant documentation within the electronic medical records was examined for the study. This included medical oncology and radiation oncology notes, nurse's notes, chemotherapy orders, radiation therapy notes and summaries, as well as medication lists. Furthermore, CERNER hospital records from Lakeland Regional Health were also examined.

Data Abstraction

The following demographic data was extracted at the time of a patient's initial oncology consult: gender, race, age range, smoking status, family and patient cancer histories, height, BSA, and any weight loss experienced prior to the oncology consult.

The following outcomes were tracked at baseline before treatment, during concurrent chemoradiation therapy (approximately 6-7 weeks in duration), and post treatment in follow up to one year: weight (>10% body weight loss), BMI, ECOG Performance Status, nausea/ diarrhea/ mucositis/ appetite related symptoms and interventions, and PEG tube insertions. Hospitalizations due to nutrition and treatment related complications were also documented.

Observations:

A total of 98 patient charts were used in this study. Thirty-three patients were diagnosed in 2013, 34 patients were diagnosed in 2014, and 31 patients were diagnosed in 2015. The majority of patients were male (64%), and almost all patients were of caucasian decent, with four patients whose race was not specified, and three patients identifying with another race. Of the 98 patients in this study, 29 of them were deceased. A higher number of patients from 2013 were deceased than the other two years. The diagnosis by which the most patients passed away was from lung and esophageal cancers.

Patients in the study were most commonly diagnosed within the age range of 61-70 years old (36%). In total, 77% of patients were smokers, of which 61% had quit smoking, as documented in the initial oncology consult. Across all three years, 69% of patients had past family cancer histories, and 32% of patients had their own personal past cancer histories.

Results:

As previously noted, a total of 39 head/neck patients, 19 rectal and anal cancer patients, and 40 lung and esophageal cancer patients were reviewed. A higher number of head/neck cancer patients were observed in 2014, while a higher number of lung and esophageal cancer patients were observed in 2013. An even sample size of rectal and anal cancer patients were observed across all three years.

ECOG Performance Status

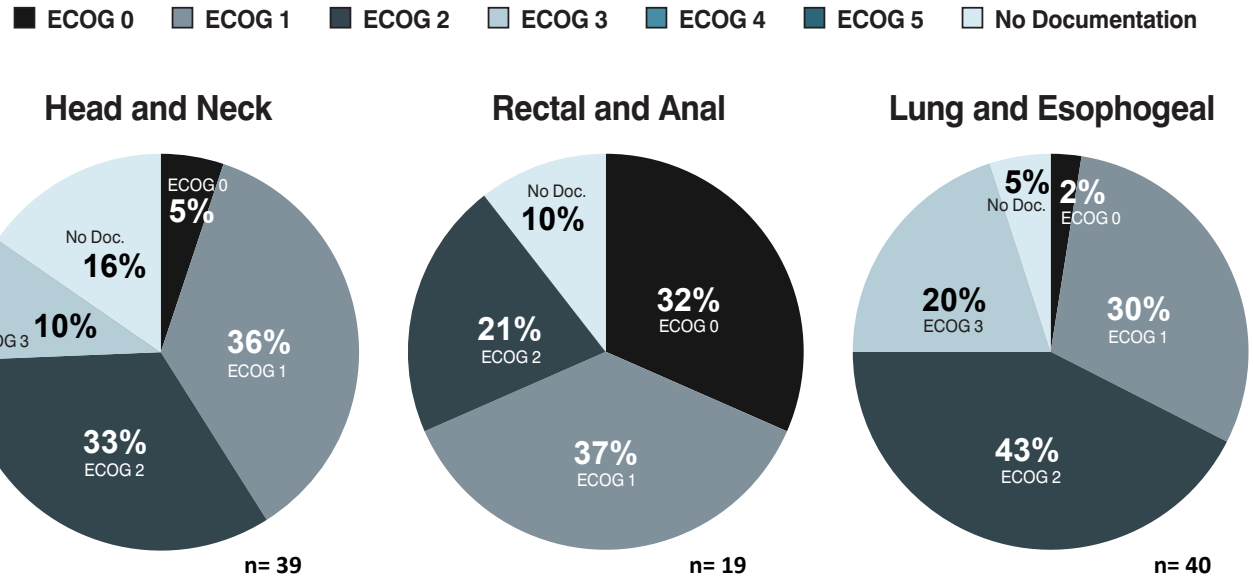
ECOG performance scores, on a scale from 0 -5, help determine a patient's ability to care for themselves, to perform daily activities, and to do physical activities such as walk or work. In this study, ECOG scores were especially important to note during the course of a patient's concurrent chemotherapy. ECOG scores were unavailable during treatment for 6 of the 39 head/neck cancer patients (15%) in 2013 and 2014. Scores were unavailable for 2 of the 19 rectal and anal cancer patients (10%) in 2013, and were unavailable for 2 of the 40 lung and esophageal cancer patients (5%) in 2013 and 2015, respectively.

Of the ECOG scores available during treatment between 2013- 2015, the most common ECOG score for head/neck, rectal, and anal cancer patients was 1 (36%), and the most common score for lung and esophageal cancer patients during treatment was 2 (43%) (Figure 1).

Weight Loss (>10% of Body Weight Lost)

Weight was tracked at baseline, throughout concurrent chemoradiation therapy (approximately 6-7 weeks), and post-treatment in follow-up to one year. Of the 39 head/neck patients reviewed, 56% of the patients lost more than 10% of their body weight from baseline to the end of their concurrent therapy, while no rectal and anal cancer patients lost greater than 10% of

Figure 1. Patient ECOG Scores By Diagnosis During Concurrent Treatment (6-7 weeks) Between 2013-2015



their body weight, and only 13% of lung and esophageal patients lost more than 10% of their body weight between 2013-2015.

Post concurrent chemoradiation therapy into patient follow-up, 26% of head/neck cancer patients still lost greater than 10% of their body weight. Only 1 rectal and anal cancer patient lost more than 10% of their body weight post treatment. Of the 40 lung and esophageal patients reviewed, 4 patients were lost to follow-up, and of the remaining 36 patients, 8% lost greater than 10% of their body weight in their follow-up (Figure 2).

Nausea and Vomiting Symptoms

Head/neck, lung, and esophageal cancer patients experienced more nausea related symptoms during treatment than rectal and anal cancer patients. Interventions given to patients for nausea symptoms include one or more of the following: anti-emetic oral or IV therapy and/or fluids. Twenty-one of 39 head/ neck cancer patients, or 54%, had nausea symptoms; of those 21 patients, 19 received interventions, which were documented in the electronic medical record (EMR). Twenty of the 40 lung and esophageal cancer patients, or 50%, experienced nausea symptoms; of those 20 patients, 19 also received interventions which were recorded in the EMR (Table 1).

Diarrhea Related Symptoms

Rectal and anal cancer patients experienced more diarrhea symptoms during concurrent treatment than in head/ neck, lung, and esophageal patients. Interventions given to patients for diarrhea related symptoms include one or more of the following: anti-diarrheal medications and/or IV hydration therapy. Fourteen of the 19 rectal and anal cancer patients reviewed, or 74%, experienced diarrhea symptoms. Of those 14 patients, 13 of them received interventions as documented in the EMR (Table 2).

Oral Mucositis

Head/neck cancer patients experienced the most oral mucositis during their concurrent therapy than rectal, anal, lung or esophageal cancer patients. Of the 39 head/neck cancer patients, 28 patients (72%) experienced oral mucositis during their treatment (Figure 3).

The highest number of patients experiencing oral mucositis was in 2014, with

Figure 2. Number of Patients By Diagnosis With >10% Body Weight Loss During Treatment and in Follow-up Between 2013-2015

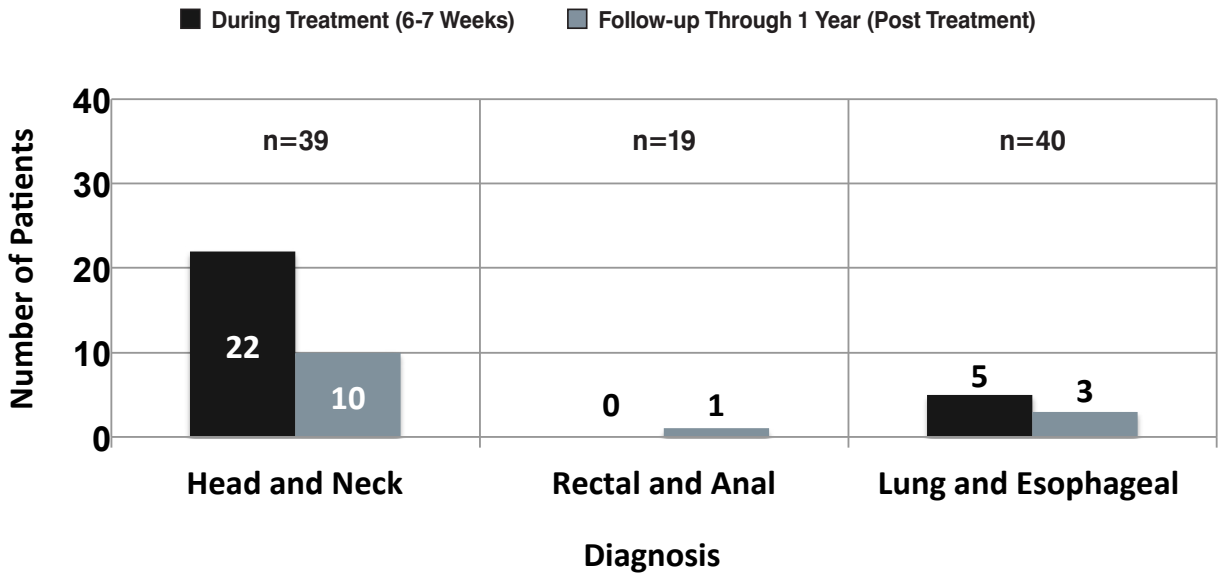


Table 1. Head and Neck, Lung and Esophageal Patients Experiencing Nausea and the Interventions Received as Documented in the EMR

	Head and Neck Cancer Patients	Lung and Esophageal Patients
# of Patients Experiencing Symptom	21/39 (54%)	20/40 (50%)
# of Patients Receiving Interventions Noted in EMR.	19/21 (90%)	19/20 (95%)

Table 2. Rectal and Anal Cancer Patients Experiencing Diarrhea Symptoms and the Interventions Received as Documented in the EMR

	Rectal and Anal Cancer Patients
# of Patients Experiencing Symptom	14/19 (74%)
# of Patients Receiving Interventions Noted in EMR.	13/14 (93%)

Table 3. Number and Percent of Head and Neck Cancer Patients Receiving a Documented Intervention Including Mouthwash, Medication, or Both for Symptoms of Oral Mucositis

	Mouthwash	Medication	Both
2013	1/4 (25%)	-	3/4 (75%)
2014	5/14 (36%)	1/14 (7%)	8/14 (57%)
2015	5/10 (50%)	-	5/10 (50%)

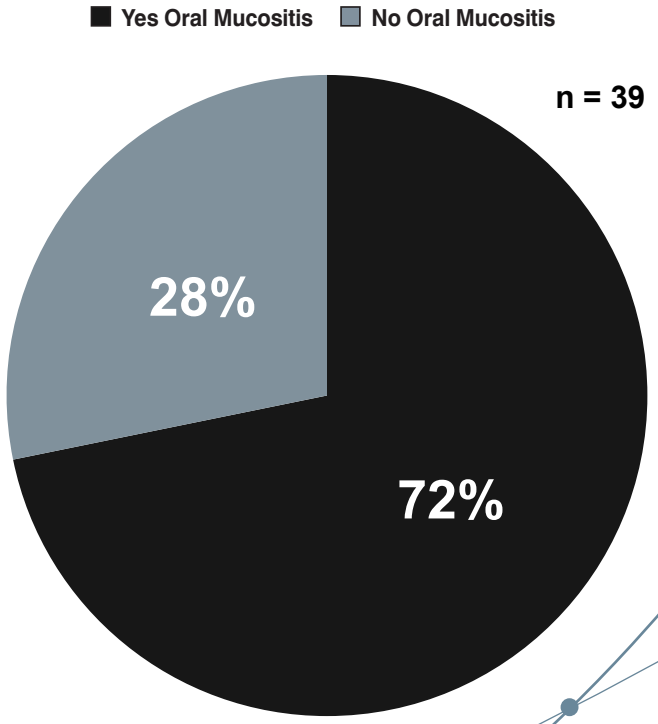
14 patients. Interventions for oral mucositis included either one or a combination of mouthwash and/or medications. Out of the 28 head/neck cancer patients with oral mucositis during their treatment, a majority were treated with a combination of mouthwash and medications (57%), as opposed to just mouthwash (39%) or just medication (4%), as shown in Table 3.

Supplements

Supplements were given to patients to help facilitate their nutritional intake. The types of supplements could include one or a combination of the following: Boost, Ensure, Jevity, TPN or IVF. Patients across all diagnoses required supplements during the course of their treatment to help with weight loss, inability to swallow or eat, and malnutrition.

The head/neck, lung, and esophageal cancer patients had the greater need for supplements, with 79% of the head/neck and 48% of the lung and esophageal patients using them to aid with nutritional intake. Only 16% the rectal and anal cancer patients needed supplements.

Figure 3. Mucositis Occurrences in Head and Neck Cancer Patients During Treatment 2013-2015



PEG Tube Insertions

No patients with rectal/ anal cancers and only 1 patient with lung/esophageal cancers required a PEG tube during 2013-2015. The head/neck cancer patients needed the most PEG tube insertions – especially due to treatment related complications. Patients suffer from severe mucositis, painful swallowing and dysphagia, decreased appetite, and severe weight loss. Thus, head/neck cancer patients undergoing chemoradiation can benefit from PEG tubes to preserve nutritional status.

Across 2013 through 2015, 24 of the 39 head/ neck cancer patients (62%) required a PEG tube placement to assist their nutritional intake. A greater number of PEG tubes were placed in 2014. PEG tubes were more frequently placed during a patient's 6-7 week concurrent treatment (84%), while 8% of patients had PEG tubes placed before the start of their treatment, and 8% of patients required PEG tubes placed after the end of their concurrent treatment in follow-up.

Hospitalizations

The number of patient hospitalizations between 2013 through 2015 for nutritional or treatment related complications was recorded. There were a total of 26 of 98 patients hospitalized (27%). A greater number of patients were hospitalized in 2014, with eleven patients. The most prevalent diagnosis with hospitalizations for nutritional and treatment related complications was in head/neck cancer patients. Of the 26 patients hospitalized, 16 of them (62%) were head/neck cancer patients.

Nutritional Assessment Tool:

The nutritional assessment tool was created to ensure a patient undergoing chemoradiation therapy are evaluated and treated for alterations in their nutritional status. The tool was implemented in September of 2015, and asks patients questions regarding symptoms such as involuntary weight loss, change in eating habits and appetite, nausea, diarrhea, swallowing difficulties, wounds/sores, and ability to perform daily activities. At the end of the questionnaire, a numerical risk value for malnutrition is assigned to the patient, with a score of 1-2 being "Low Risk", 3-4 being "Moderate Risk" and 5 or more being "High Risk".

Of the 31 cancer patients diagnosed in 2015 and reviewed in this study, 17 patients received the nutritional tool, across all diagnoses: four head/ neck cancer patients, four rectal and anal cancer patients, and nine lung and esophageal patients.

One of the 17 patients (6%) received the tool before the start of treatment, eight of 17 (47%) received the tool during the course of their treatment, and 8 of the 17 patients (47%) received the tool after their concurrent treatment had been completed.

Based on the risk scores for the 17 patients who completed this tool, five patients were considered to be at high risk for malnutrition (29%). Of those five patients, only two were further referred to visit with a dietitian to discuss a plan to improve their nutritional status. The other three patients did not receive a referral, as one patient refused, one patient went to hospice, and one patient did not receive a referral per doctor's orders.

Discussion:

On average, 33 patients were reviewed per year across 2013 through 2015. Considering the sample size, the year in which the highest number of patients lost more than 10% of their body weight occurred in 2014 (35% of patients). The percent of patients receiving supplements to facilitate nutritional intake during therapy increased between 2013 and 2014, from 52% to 65% respectively. The percent of patients receiving supplements decreased by 20% from 2014 to 2015, and this could reflect that interventions are being provided before supplements become necessary.

Between 2013 and 2014, the percent of patients receiving a PEG tube for nutritional intake increased from 9% to 29%, but between 2014 and 2015 PEG tube insertions decreased by 6% (from 29% to 23%). Head and neck patients typically require the most PEG tube placements, and this was seen at Watson Clinic in 2014. Therefore, the difference in the percent of PEG tube placements between years could be due to the variation in sample size.

While the number of patients who received the nutritional assessment tool in 2015 is too limited to draw conclusions in this study, the tool can be greatly beneficial in helping assess the risk for malnutrition and help patients receive the interventions they need to improve their nutritional status

Conclusion:

Our cancer center adhered to the national guidelines for assessing patients in need of nutritional support and implemented care immediately when a patient's weight and nutritional status was in decline.

Patients were given prophylactic PEG tubes due to their poor nutritional status prior to therapy. Patients were also evaluated on a weekly basis to assess their improvement or deterioration in their nutritional status. Additional steps were taken as necessary to facilitate nutritional intake, including hospitalizations for patients requiring immediate nutritional attention.

Overall, our cancer center addressed patient needs without compromising quality of care and treatment for cancer. Now, with the implementation of the nutritional assessment tool, our center expects to intervene even earlier and help navigate patient care.

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STUDY:

Patterns of Care for Skeletal Metastases Treated with Radiation Therapy at Watson Clinic Cancer & Research Center

John Barrett MD, PhD, Principal Investigator
Agustin Tavares, Student Researcher

Abstract:

Many patients with late stage cancer develop metastatic disease. Bone metastases in particular are known to cause patients significant pain and discomfort. Palliative radiation is a convenient treatment for these patients because it relieves pain and preserves skeletal structure, all with minimal side effects. The American Society for Radiation Oncologists (ASTRO) recommends the use of less than 10 fractions in patients without complications in order to save them time and money with equivalent care. This retrospective study analyzed patients treated with palliative radiation at the Cancer & Research Center between 2013-2015. Electronic medical records were examined for pain relief, ECOG scores, and narcotics use before and after treatment. Statistical significance ($P = 0.05$, Wilcoxon rank-sum) was found in ECOG score change, but not in narcotics use. There was shown to be a slight decrease in fractions used over time. It was not significant and the most commonly used fraction remained 10 fractions. In terms of response to treatment, 73.8% of patients showed partial response, 7.1% showed complete response, 7.1% showed pain progression, and 11.9% of patients had an incomplete response.

Introduction:

Bone metastases are a significant source of morbidity among patients with advanced stage cancers, often causing severe pain and disability. Such lesions can be painful and increase the risk of pathologic fracture or spinal cord compression. Bone metastases also impose a significant economic burden on society. The International Atomic Energy Agency (IAEA) estimates that approximately 100,000 cases of bone metastases occur annually in the United States (1). Radiation therapy has been proven to be efficacious in the management of symptomatic bone metastases, providing significant palliation for 50% to 80% of patients. Multiple studies have confirmed that equivalent palliation can be achieved with a single 8-Gy fraction or longer courses (2).

The benefits of patient convenience and reduced healthcare costs with single-fraction courses more than make up for any association with higher rates of retreatment to the same anatomic site. These higher retreatment rates could be explained by physician bias against single-fraction treatment and knowledge that a single 8-Gy fraction allows for retreatment with lower risks of toxicity.

In 2011, the American Society for Radiation Oncology (ASTRO) published a consensus guideline affirming the safety and efficacy of single-fraction treatment for uncomplicated bone metastases (3). Uncomplicated bone metastases, defined as a) lesions without spinal cord compression, cauda equina compression, radicular bone pain, or extensive involvement (>3 cm) of the femoral cortex, b) lesions not requiring surgical stabilization, c) spinal lesions that have not been previously irradiated, and d) lesions for which retreatment would not be excessively problematic. As part of the 2013 Choosing Wisely campaign, ASTRO further advises against the use of extended fractionation schemes (>10 fractions) and encourages the consideration of single-fraction treatments. Despite the growing body of evidence, a National Cancer Data Base (NCDB) analysis has reported that fewer than 5% of patients received single-fraction treatment, and 29.5% of patients received courses with more than 10 fractions.

In this retrospective study, we review the composition of patients who present to us with symptomatic metastatic bone metastases, examine our patterns of care for skeletal metastases treated with palliative radiation therapy, document treatment results, and make recommendations for improvement in our patterns of care.

Material Methods:

Electronic medical records were used to identify all patients whose RT course was for bone metastases from any primary tumor, treated between 2013 and 2016. Patient fractionation patterns were also analyzed. Response to treatment in terms of pain relief on a scale of 0% to 100% and narcotic analgesia requirements before and after treatment (usually assessed at the first follow-up visit 30 days post treatment) were recorded (using an equivalency calculator for

the various narcotics prescribed to convert them to an oral morphine equivalent (4)). The ECOG performance status of each patient was also recorded before and after treatment.

The Kruskal-Wallis nonparametric test was used to compare pain relief at different fractionation schemes. The Wilcoxon rank sum test was used to compare narcotics use and ECOG scores.

The International Bone Metastases Consensus Working Party's definitions were used in order to determine responses to RT. Complete response is a complete relief of pain without an increase in narcotic analgesia. Partial response is defined as reduction of 20% or more in pain without an increase in narcotic analgesia or no change in pain with a 25% or more decrease in narcotic analgesia. Pain progression is either when there is an increase of 20% or more in pain or narcotic analgesia use rises 25% or more. Incomplete response is when neither of those conditions are met (3).

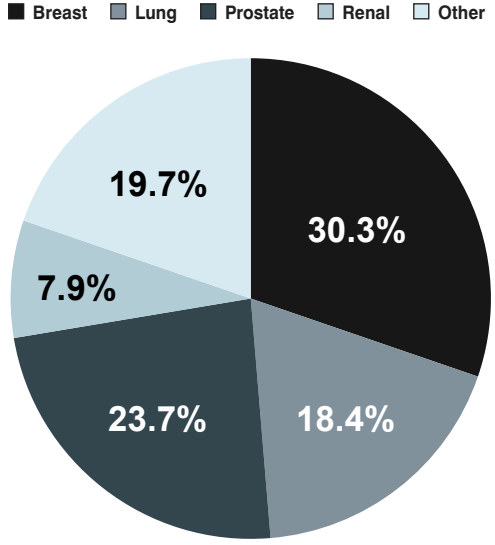
Results:

The study consisted of 77 patients (51.3% female and 48.7% male). A majority of the patients were White/Non-Hispanic (89.5%), with a few patients that were White/Hispanic, Black/Non-Hispanic, and Asian/Non-Hispanic. The median age was 73 (range 31-91) (TABLE 1). The most common primary cancer sites were breast (27.3%), followed by prostate (23.6%), lung (18.2%), and renal (7.3%) (FIGURE 1). The most common fractionation scheme was 10 fractions (47.3%), followed by five fractions (18.9%). Single fraction was one of the least common treatments with only 1.4% of patients receiving it (FIGURE 2).

Table 1. Patient Characteristics

Age	
Mean (SD)	70.4 (13.0)
Median (Range)	73 (31-91)
Gender	
Male	37 (48.7%)
Female	39 (51.3%)
Race	
White/Non-Hispanic	68 (89.5%)
White/Hispanic	3 (3.9%)
Black/Non-Hispanic	3 (3.9%)
Asian/Non-Hispanic	2 (2.6%)

Figure 1. The Most Common Primary Cancer Sites



There was a slight, nonsignificant decrease in the average number of fractions used per course of radiation therapy over time (FIGURE 3).

There was no statistically significant difference between narcotic use before and after (p=0.0954) (FIGURE 4), but there was a significant difference between ECOG performance scores before and after (p=0.0112) (FIGURE 5). There was no significant difference in pain relief from the different fractionation schemes (p=0.8521) (FIGURE 6). A large majority of patients reported partial response to treatment (83.1%), 5.1% reported complete response, and only 3.4% reported pain progression (FIGURE 7).

Figure 2. The Most Common Radiation Fractionation Schemes Used

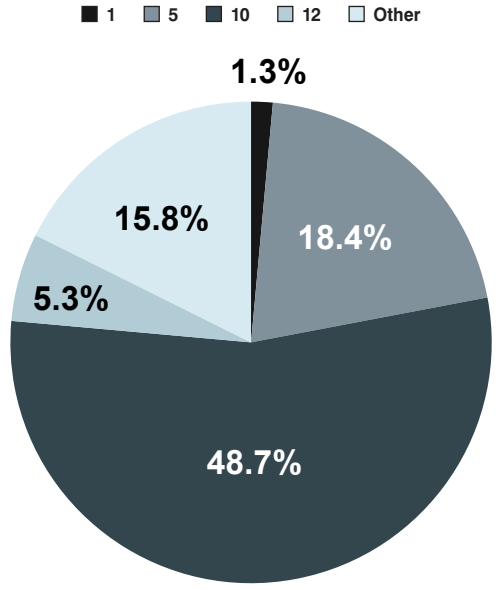


Figure 3. Average Number of Fractions per Course by Year (p=0.4211)

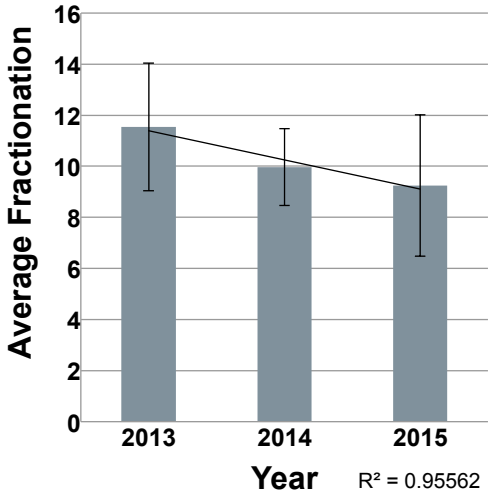


Figure 4. Change in Oral Morphine Equivalent Dose Before and After Radiotherapy (at 30 Days Post Treatment) (p=0.0954)

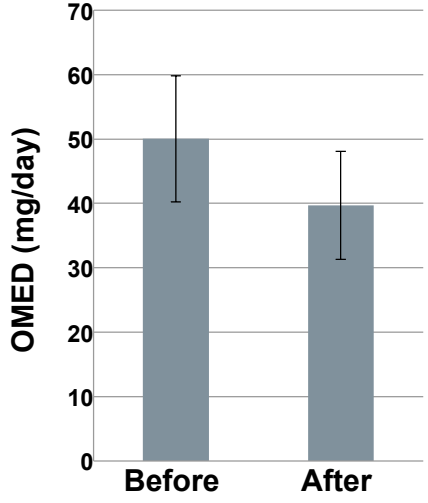


Figure 5. Average ECOG Performance Score Before and 30 Days Following Completion of Radiotherapy (p=0.0112)

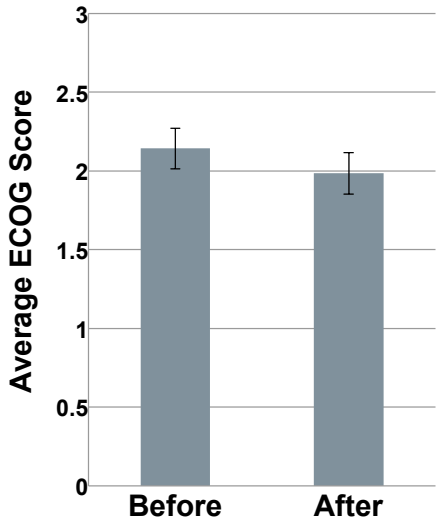


Figure 6. Percentage of Pain Reduction According to the Number of Fractions per Course of Radiotherapy (p=0.8521)

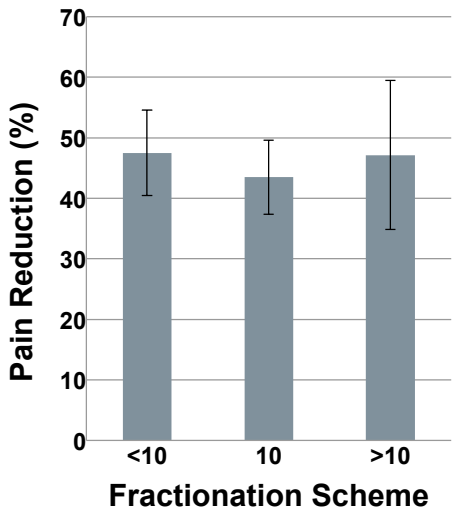
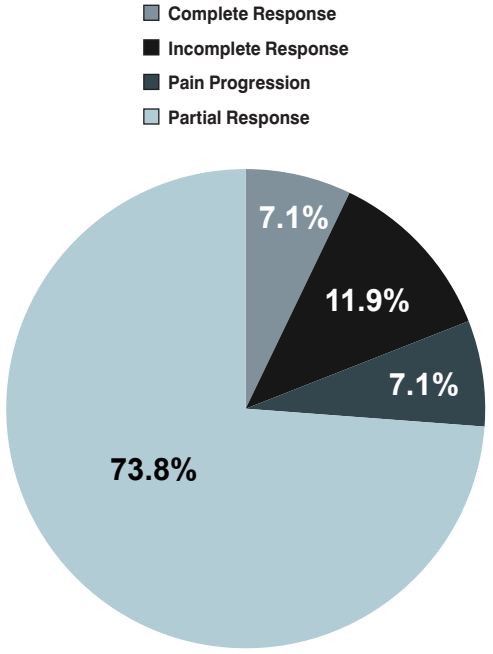


Figure 7. Skeletal Bone Pain Response to Radiotherapy According to the International Bone Metastases Consensus Working Party's Definitions



Discussion:

Despite the growing body of evidence for choosing shorter fractionation schedules, the national use of single-fraction treatments remains low. An analysis of 3050 patients with bone metastases from prostate cancer that used the SEER (Surveillance, Epidemiology, and End Results Program) database revealed a single-fraction utilization rate of 3.3%, and greater than 50% of patients received more than 10 fractions. Our own institution reflects this slow adoption of this shorter course, larger fraction treatment scheme. ASTRO released a consensus guideline for palliation of bone metastases in 2011, which concluded that effective palliation can be safely achieved with a single fraction. The association of longer courses with lower incidence of repeat treatment is outweighed by the convenience of single-fraction treatment for patients and caregivers. The NCDB analysis found that the distance from a patient's home to the treatment facility was the strongest independent predictor of single-fraction treatment, which suggests the importance of convenience to patients. The relative convenience of <5 treatments instead of 10 may be more attractive to patients seeking relief of pain due to bone metastases. There is also a significant economic advantage, with an estimated savings of $3094 per treatment course compared with multifraction treatment.

This review of the patterns of care at the Cancer & Research Center document the demographics of our patient population referred for palliative radiation therapy of bone metastases and demonstrate the good palliative effect of radiation therapy for painful bone metastases using a variety of fractionation schemes, comparable to nationally published figures.

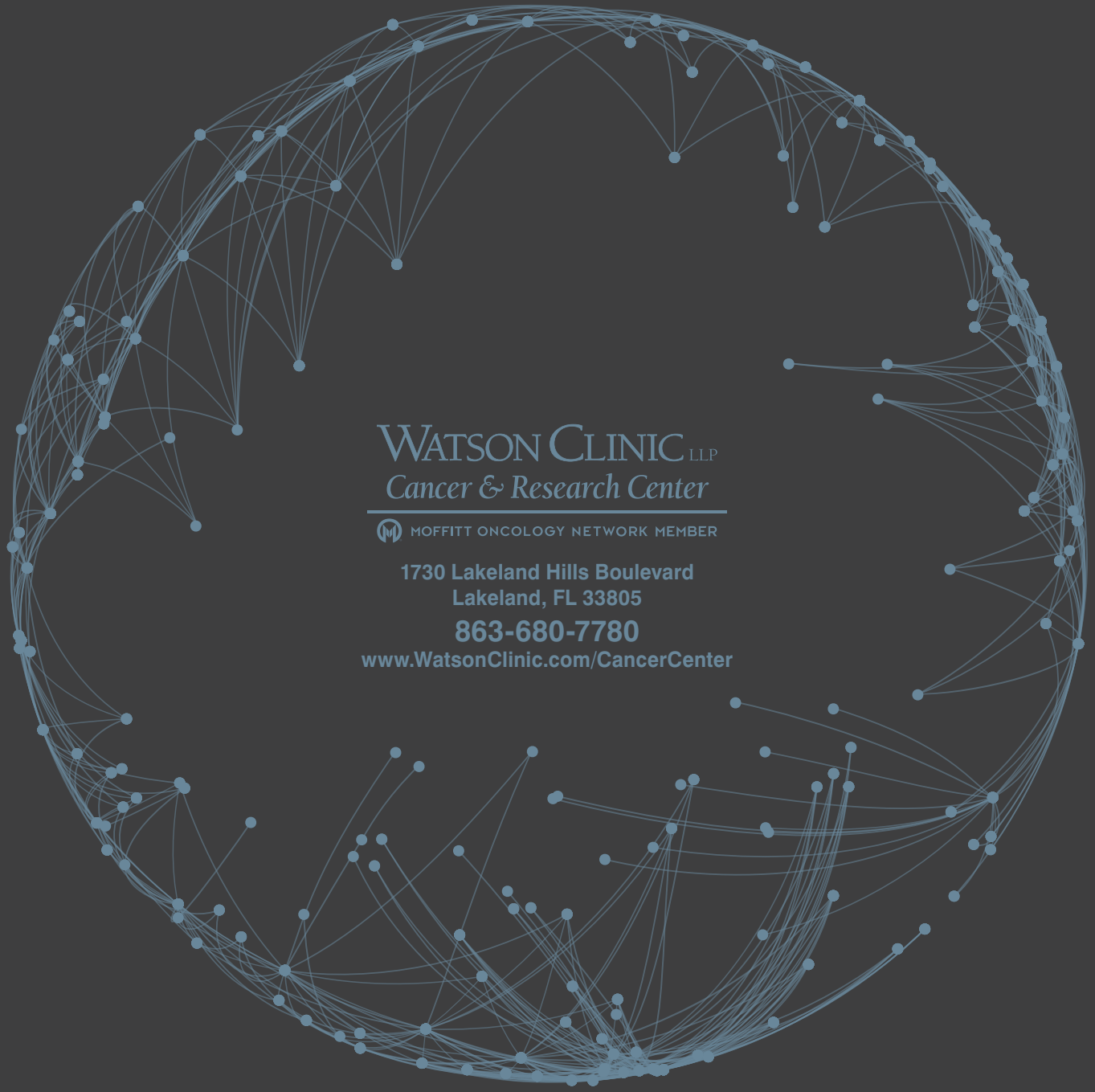
Our recommendation is that physicians develop their own evidence-based decision tree for choosing fractionation schemes for uncomplicated skeletal metastases, and more carefully document response to treatment (both in terms of pain relief on the pain scale and narcotic use requirements), and adverse side effects of treatment.

References:

1. International Atomic Energy Agency. Criteria for Palliation of Bone Metastases: Clinical Applications. Vienna, Austria: International Atomic Energy Agency; 2007.
2. Chow E, van der Linden YM, Roos D, et al. Single versus multiple randomized non-inferiority trial. Lancet Oncol 2014;15: 164-171.
3. Chow E, Hoskin P, Mitera G, Et al. Update of the international consensus on palliative radiotherapy endpoints for future clinical trials in bone metastases. Int J Radiat Oncol Biol Phys 2012;82:1730-1737.
4. http://opioidcalculator.practicalpainmanagement.com/conversion.php

Resources and INFORMATION *on Cancer*

- **A Place For Her**
  727-447-1146 • www.aplaceforher.com
- **American Cancer Society (ACS)**
  800-227-2345 • www.cancer.org
- **American College of Surgeons (ACoS)**
  800-621-4111 • www.facs.org
- **American Institute for Cancer Research (AICR)**
  800-843-8114 • www.aicr.org
- **American Lung Association**
  www.lungassociation.org
- **CancerCare**
  800-813-HOPE • www.cancercare.org
- **Centers for Disease Control and Prevention (CDC)**
  www.cdc.gov
- **Central Florida Health Care Center**
  866-234-8534 • www.cfhconline.org
- **Chronic Disease Fund**
  877-968-7233 • www.cdfund.org
- **Citrus Connection Handy Bus**
  www.ridecitrus.com
- **Comfort Keepers**
  866-225-0320 • comfortkeepers.com
- **Commission on Cancer (CoC)**
  312-202-5009 • www.facs.org/cancer
- **Compassionate Care Hospice**
  877-494-3219 • www.cchnet.net
- **Cornerstone Hospice**
  866-742-6655 • web.cshospice.org
- **Department of Children and Families**
  407-317-7000 • www.myflfamilies.com
- **Florida Cancer Data System (FCDS)**
  305-243-4600 • www.fcds.med.miami.edu
- **Florida Department of Health (FDH)**
  www.doh.state.fl.us
- **Good Shepherd Hospice**
  800-544-3280 • www.chaptershealth.org
- **Healthwell Foundation**
  800-675-8416 • www.healthwellfoundation.org
- **Lakeland Volunteers in Medicine**
  863-688-5846 • www.lvim.net
- **Leukemia & Lymphoma Society**
  800-955-4572 • www.leukemia-lymphoma.org
- **Lighthouse Ministries**
  863-687-4076 • www.lighthousemin.org
- **National Cancer Institute (NCI)**
  800-4CANCER • www.cancer.gov
- **Nurses Helping Hands Assisted Living**
  www.nurseshelpinghandsalf.com
- **Patient Access Network**
  866-316-7263 • www.panfoundation.org
- **Patient Advocate Foundation**
  800-532-5274• www.patientadvocate.org
- **Patient Services, Inc.**
  800-366-7741 • www.patientservicesinc.org
- **Polk County Elderly Services**
  863-534-5320
  www.polk-county.net
- **Polk County Transport**
  www.polk-county.net
- **Social Security Administration**
  www.ssa.gov
- **Susan G. Komen**
  800-468-9273 • www.komen.org
- **Talbot House**
  863-687-8475 • www.talbothouse.org
- **United Way**
  2-1-1 or 863-648-1515 • www.uwcf.org
- **VITAS Hospice**
  863-583-7100 • www.vitas.com
- **Volunteers In Service to the Elderly**
  863-284-0828 • www.viste.org
- **We Care of Polk County**
  863-662-4227
  www.wecarecentralflorida.org



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