

Knowledge that will change your world





Letter from the Chairman

Over the last several years, UAB Radiation Oncology has held a research retreat prior to the annual meeting of the American Society for Radiation Oncology (ASTRO). The retreat involves faculty presentations of research projects that have been accepted for presentations at our large fall meetings. This year, faculty members discussed a wide range of topics. Examples included the study of important cellular



Dr. James Bonner

proteins that impact radiation sensitivity, ideal brachytherapy placements and doses, and physical parameters of patient treatments; just a few of the many projects that were discussed.

The retreat aims to provide a venue for communication between faculty members. We have a large faculty with diverse interests and they are busy throughout the work day. This fact sometimes hinders day-to-day communication. The retreat allows us to interact in a casual setting and brainstorm about projects that can build on existing work, or new projects that may bring together several faculty members who have not collaborated in previous research efforts.

The retreat also allows our faculty to socialize and chat about their lives outside Radiation Oncology. Our experiences outside of Radiation Oncology provide perspectives that make us better caregivers and improve our ability to understand our patients. It is important to clear one's mind, as doing so often allows for solutions to problems at work to arise and great projects to be inspired. Clearing our minds through discussion of common outside interests can be very beneficial. Great research and treatmentide as often emerged uring weekend activities such as running, tennis, or swimming.

The retreat includes a dinner in which spouses are invited to attend. This year, our dinner featured two outstandings peakers: Dr. Kimberly Keene and Dr. Chris Willey. A summary of their presentations is included later in the journal.

Our group is a vibrant enterprise of outstanding clinical activity, strong educational efforts, and terrific research. The retreat emphasizes these points. We have multiple faculty members who are truly involved in every aspect of Radiation Oncology. We are not in a position where one critical person is needed for outstanding efforts to occur in any of our three major missions: clinical care, education, and research. We need to continue to foster our environment of looking forward and seeking answers to the most pressing questions in the field. I am proud to be a member of our group.



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About the cover:



In our facility, we utilize the PamStation®12 (PamGene International) Kinomic Array platform to study the kinome. This system utilizes a high content peptide microarray containing phosphorylatable tyrosine (PTKchip) or serine/threonine (STKchip) residues within kinase substrates. Active kinases within a sample will phosphorylate specific peptides on the microarray to generate a kinomic profile, or fingerprint.

2014 Annual Research Retreat

"The retreat allows us to interact in a casual setting and brainstorm about projects that can build on existing work, or new projects that may bring together several faculty members who have not collaborated in previous research efforts." - Radiation Oncology Chair Dr. James Bonner



Pictured: (First row left to right) Dr. Christopher Willey, Dr. Sui Shen, Dr. James Bonner, Dr. Ravinder Clayton, Dr. Ruby Meredith

(Second row left to right) Dr. Lee Burnett, Dr. Rojymon Jacob, Dr. Markus Bredel, Dr. Richard Popple, Dr. Kimberly Keene, Dr. Ivan Brezovich, Dr. Eddy Yang, Dr. John Fiveash

(Third row left to right) Dr. Xingen Wu, Dr. Jennifer De Los Santos, Dr. Rex Cardan, Dr. Chris Dobelbower, Dr. Jun Duan, Dr. Robert Kim



Dr. John Fiveash and Dr. Sharon Spencer



Dr. Rojymon Jacob and Dr. Robert Kim



Dr. Ravinder Clayton and Dr. Ruby Meredith



Dr. Lee Burnett and Dr. Chris Dobelbower



Dr. Ivan Brezovich





Using Kinomics to Identify Targets for Radiation Enhancement

Dr. Christopher Willey



Kinases represent one of the most important groups of targets for drug development in cancer. This is because they are principle players in signal transduction cascades in biology. However, investigating kinases has been challenging as they are typically not regulated at the genomic or transcriptomic level. Rather, they are usually regulated post-translationally. Kinases are

often transiently activated, particularly in response to therapies such as radiation, which further complicate their investigation. As such, global kinase evaluation, or "kinomic profiling," is being

developed to better studybiological systems. Kinomic profiling represents an important functional proteomic strategy that we have applied to radiation signaling and response.

In the UAB Kinome Core, directed by Christopher Willey, MD, PhD and technical director Joshua Anderson, PhD, weutilize the PamStation®12, a high content peptide substrate microarray platform to measure

global kinase activity in cell and tissue lysates. This approach directly measures kinase activity within protein lysates that allows for hypothesis generation, particularly related to radiation signaling. We have applied this technology to better understand radiation-induced signaling as well as radiation response correlation.

One of our current projects is an investigation of radiation-induced signaling in a model of tumor vasculature, namely Human Umbilical Vein Endothelial Cells (HUVEC). HUVEC are relatively radiation resistant, requiring a time course study in which HUVEC were irradiated with sham or 3 Gy. Following this irradiation, the cells were harvested and kinomically profiled at multiple time points within the first hour after irradiation. Interestingly, this profiling identified the nerve growth factor receptor tyrosine

kinases, NTRK1 and 2 (also known as TrkA and TrkB), as being highly activated (though transiently) upon irradiation of the cells. When NTRK activity was blocked, HUVEC became radiation resistant. Conversely, when NTRK activity was stimulated, the cells became radiation sensitive. As such, we were able to identify a novel mechanism for radiation response in these cells.

We are also examining a Glioblastoma multiforme (GBM) tumor avatar system available within the Brain Tumor Animal Model Core directed by Dr. Yancey Gillespie. This model system involves tumors that have been propagated solely in immunocompromised mice, and thus, more closely resembles patient tumors. We have "omically" characterized these tumors as part of an NIH Chemical Biology Consortium grant program. Importantly, some of these tumors are known to be radiation sensitive, while some are known to be radiation resistant. Therefore, we examined their

kinomic profiles to try to identify kinomicpredictors of radiation sensitivity and resistance. We identified several potential kinase regulators, particularly the non-receptor tyrosine kinases, FAK and PYK2, as being likely mediators of this process.

Tumor Biology

Direct Analysis of
Tumor Biology

Personalized Therapy
Selection

Tumor Avatar
Testing

We envision comprehensive
biology assessment of each
patient's (or avatar) tumor so
that we can select the best
available therapy and
improve outcomes.

We have also

examined the use of kinomic (and other high content "omic" data) in the setting of clinical and translational studies. The accompanying figure illustrates how tumor avatar systems combined with patient profiling may help clinicians identify appropriate therapy for patients. Bioinformatics strategies are critical to interpreting this data and developing this potential paradigm of personalized medicine.

These projects follow our lab's research avenues: hypothesisgenerating and hypothesis-directed. By conducting hypothesisgenerating research, we are able to discover new information and inspire further research. By conducting hypothesis-directed research, we are able to discover the depth and validity of current hypotheses. Exploring both research avenues provides new and innovative directions, procedures, and treatments for researchers and clinicians alike.



Toll Like Receptor-9 (TLR9) is a cellular DNA receptor. As a member of the innate immune system, it reacts to both microbial and vertebrate (self) DNA that has entered cells, either during microbial infections or during cell death. Activation of TLR9 by DNA stimulation results in a rapid and robust inflammatory reaction, with increased production

of inflammatory mediators. It was initially thought that TLR9 expression is limited to the cells of the innate immune system. It is now, however, well established that TLR9 is widely expressed also in various cancer cell lines including breast cancer. Although TLR9-ligand induced in vitro invasion in cancer cells is well characterized, the role of TLR9 in the pathogenesis of various cancers remains poorly understood. Intriple negative breast cancer, low tumor TLR9 expression has been shown to be associated with poor disease-specific survival, suggesting that high tumor TLR9 expression confers protection from relapses in these diseases. Recent studies with a pre-clinical model of TNBC suggest that the immunogenic benefit of chemotherapy may indeed depend on tumor TLR9 expression status.

Large population-based studies have identified a higher proportion of triple-negative breast tumors among premenopausal African-American women. Furthermore, compared with Caucasian women, African-American women with TNBC often have less favorable outcomes. Furthermore, it was recently demonstrated that the single nucleotide polymorphisms (SNPs) in the TLR9 gene that are associated with tuberculosis are different between African-American and Caucasian populations. Overall, very little is known about TLR9 polymorphism in breast or other cancers. Our preclinical findings suggest that tumor TLR9 may have a role in immunological treatment responses in TNBC, but there is no

clear association with TLR9 SNPs and the risk of developing breast cancer. The aim of this study was to evaluate tumor TLR9 expression among African-American TNBC patients and to assess its relationship to survival and recurrence in this patient population. We reviewed 66 African American patients from the UAB registry and of these 43 had tissue available for testing. TLR9-staining intensity scores (0-16) were divided into low (<8) and high (≥8), according to the previously used criteria. The TLR9 staining range was similar as detected in the Finnish cohort, which was studied previously. However, tumor TLR9 staining score was not significantly associated with ipsilateral breast tumor recurrence, disease-free survival, or breast cancer specific survival (Fig 1).

In conclusion, tumor TLR9 expression may affect the outcome of patients that have triple negative breast cancer. However, our findings suggest that the predictive value may be significant for Caucasian patients only. These studies call for further studies, including complete sequencing of the tumor TLR9 gene and its regulatory areas in various TNBC patient populations.

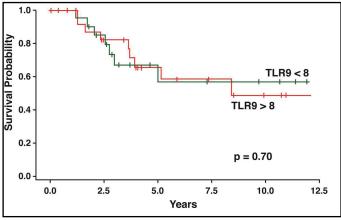


Figure 1. Breast Cancer Specific Survival based on TLR9 staining intensity.





The morning of September 15th began very early for a few members of UAB's Department of Radiation Oncology. While visions of the previous evening's ASTRO reception continued to dance in the pillow-bound heads of our colleagues, a select group rose from their

slumbers to face the day with verve and enthusiasm. Chairman Dr. Jim Bonner, adjunct professor and previous resident Dr. Jimmy Caudell, current resident Dr. Craig Baden and his wife Lori, and I rubbed the sleep from our eyes and laced up our running shoes. We were the few, the intrepid, the fatigued.

After a bus ride through the empty streets of San Francisco, we arrived at Golden Gate Park, the site of this year's Running Strong-5K Run for the Future to Benefit the Radiation Oncology Institute (ROI). This 5K was the brainchild of Dan Moore, CEO of Radiation Business Solutions. Moore, an avid runner, wanted to create an event to help support the radiation oncology industry. Over 250 runners came out to participate in the inaugural 5K held on November 1, 2010, during the ASTRO annual meeting in San Diego.

Each year since, the run has grown, bringing out new runners and new challenges. The 5K has now become a yearly tradition, held in the early morning hours on the Monday of the ASTRO annual meeting. Radiation Business Solutions continues to host the event and covers all costs, so every dollar donated by sponsorships and registration fees goes straight to the ROI.

The Radiation Oncology Institute is a non-profit, 501(c)(3) foundation created in 2006 by the American Society of Radiation Oncology. The ROI acts as a vehicle to support research and education efforts that enhance and confirm the critical role of radiation therapy in improving cancer treatment. The ROI strategically funds research on new and existing radiation therapy treatments to identify links between best practices and improved

outcomes, to evaluate the efficacy and cost-benefit of radiation therapy and to foster multi-institutional research in radiation oncology.

I am told that Golden Gate Park abounds in natural beauty, but at the early hour and without benefit of daylight, I can't comment upon much except for the overshadowing oaks, dark against even the night sky. The race began promptly at 6:30 A.M. Lest you think it's always sunny in California, sunrise was not until 6:52, so I really was not able to see much during the race itself either. I do recall an extremely vivid impression of Dr. Bonner's back rapidly disappearing into the darkness mere moments after the starting signal. That was the last any of us saw of him until after the race.

Reviewing the course afterwards, I learn that I ran past a polo field, equestrian center, and lake, none of which I saw. My highlight from the race was seeing a self-confidently bovine bison chewing the cud in the morning's mist. Even larger than New York's Central Park, Golden Gate Park has plenty of room to tuck such surprises among its more than 1,000 acres. The running was much as one would expect and fortunately did not feature any of the steep hills for which San Francisco is known.

Finishing with a fleet-footed time of 19:47, Dr. Bonner beat the sun and over 200 other racers to the finish line. I won't reveal any privileged information regarding our chairman, but the tenrunners who finished ahead of him had an average age of 35. The rest of the team ran well, but without distinction. However, the UAB Radiation Oncology team was at least present, while a number of other attendings and previous residents were conspicuously absent. (You know who you are.) In closing, I will note that the winning academic team, the Mayo Clinic, had been provided with racing uniforms (not conservative suits, but unrestrictive tanktops). Had we been similarly equipped, our performance may have been correspondingly fleet, permitting us to win \$1,000 for an institutional scholarship fund. There's always next year...



Radiation Oncology's Dr. Markus Bredel, MD, PhD has joined the senior leadership team within the UAB Hospital Comprehensive Cancer Center as Deputy Associate Director for Translational Research. He will work closely with Dr. Mary-Ann Bjornsti, Associate Director of Translational Research, to expand efforts to bridge basic research and clinical research.

One of the main purposes of NCI-designated Cancer Centers is to capitalize on basic cancer research capabilities and to integrate programsinlaboratoryandclinical research through a transdisciplinary, translational research enterprise. Dr. Bredel believes that improving communication between basic and clinical scientists is the key to developing and strengthening such a research enterprise at UAB.

"Any cancer center has different levels and entities who work together. On one end, you have a basic science effort. On the other, you have the clinical effort. There is often a disconnection between these two entities," Dr. Bredel explained. "Maintaining a continuous flow of new information between the two is critical. New basic science information is supposed to translate into the clinic, in what we refer to as 'bench-to-bedside' research."

The Comprehensive Cancer Center initially lacked a position dedicated to strengthening 'bench-to-bedside' research. Dr. Bredel noticed this and felt his past experience with translational research qualified him to step into such a role.

"Our brain tumor research team has been fairly successful in translational research. We have had several journal articles published in the last few years. These articles provided examples of how we can translate research into meaningful clinical endpoints," he said. "That work provided the inspiration that we might be able to provide the cancer center a service to improve its translational research efforts."

"One of my tasks is bridging these two different worlds; to make sure that the basic scientists and clinicians interact and make sure that we have a constant dialogue between the two," Dr. Bredel continued. "We have some dialogue like that in our cancer center, but I believe we can improve it."

The National Cancer Institute routinely examines translational research efforts in comprehensive cancer centers. NCI-based examinations typically focus on 'deliverables,' discoveries, breakthroughs, or methods which impact and improve patient survival and quality of life.

Dr. Bredel believes these deliverables cannot be created without improved communication. He is currently working with the cancer center's different working groups to improve research communication.

"Deliverables can only be created with a mechanism to translate findings to the clinic. Translation is challenging because it often involves different worlds that almost speak different languages," Dr. Bredel said. "I am meeting with each of the eight clinical working group chairs to find out their needs and figure out exactly what we as a cancer center can do for them. That is the first step, understanding exactly what each working group needs and the thoughts that they have."

Dr. Bredel is also creating and managing new procedures to improve communication between basic scientists and clinical researchers. Both procedures were inspired by his current work in brain tumor research. The Translational Research in Progress (TRIP) meetings provide a collaborative environment to share new ideas, while proposed funding mechanisms provide financial support for collaborations between basic science and clinical research.

"We will try to hold TRIP meetings every month. The presenter can be a clinician, a basic scientist, or a translational researcher," Dr. Bredel explained. "The meetings allow us to see and share the new ideas and concepts being worked on by everyone involved. This mechanism allows everyone to share potential ideas and resources for basic science, translational research, and clinical research."

"We are examining small funding mechanisms, like the SPORE mechanism in a larger concept," he continued. "Basically, we are willing to provide seed funding if a clinical scientist and a basic scientist team up and let us know of a project they want to collaboratively pursue."

Dr. Bredel believes these current actions will be beneficial for the Cancer Center, but must be maintained and improved over time to create truly lasting improvements.

"I think that our cancer center has the potential to grow. We think our current action will help, but there is no quick and easy fix to get to where we want to be. This work will take many months, perhaps even many years to complete," Dr. Bredel said. "The goal is to improve over the next few years and make sure we are aligned in practice with some of the best cancer centers in the country. By improving our practice, we will become more competitive as a cancer center at large."



Our Executive Committee attended the Particle Therapy Cooperative Group (PTCOG) of North America inaugural meeting in Houston, TX from October 27th to October 29th. Our attendance was part of our continued effort to stay on the cusp of technologically advanced patient therapy.

Our department has been staying abreast of proton treatment developments for many years. Early proton treatment results suggest that the initial hope that proton radiation would be biologically better appears to be unlikely for most cancers. However, the use of proton treatments appears to provide dosimetrical advantages for many disease sites; including pediatric malignancies and head & neck malignancies. Therefore, these dosimetrical advantages, and possible biological advantages for certain tumors, continue to make this therapy very attractive.

ofthenormalbowel. These improved dose distributions will most likely result in less late toxicities and second malignancies. These pediatric examples are exciting and serve as the nidus for extrapolation of proton treatments to many adult tumors. We are very interested in this potential future treatment.



The committee also enjoyed the celebration of the PTCOG's first honored professor, Dr. James Cox, of MD Anderson Hospital, for his distinguished service to this treatment arena. Dr. Cox has been a role-model for many radiation oncologists over the years. Dr. Thomas Bucholz, the current chief of the Radiation Oncology division at MD Anderson, gave a tremendous review of Dr. Cox's contributions to our field. Dr. Coxinitiated the development of the MD Anderson proton facility and has been a key investigator in a field that was in the doldrums prior to his entry.

Dr. Anita Mahajan, medical director of the Proton Therapy Center at the University of Texas MD Anderson Cancer Center, eloquently described MD Anderson's experience with proton treatments in pediatric cases. She showed the use of proton therapy for cranial-spinal treatments and other common pediatric malignancy therapy options. Dr. Mahajan also demonstrated that proton therapy resulted in substantial improvements in radiation dose distributions to normal structures that were close to the targeted volume. For example, the use of proton therapy for cranial-spinal treatments spared much more

Our leadership team will continue to explore proton treatments for UAB patients. We believe that there are defined dosimetrical advantages for the use of proton treatments in certain tumor sites. We would like to offer these potential advantages to our patients. Also, we would like to be pioneering researchers in the development of future indications for proton treatments. Proton treatments are a new, constantly-evolving treatment. There will be more to come on this issue as we and other researchers and clinicians examine this exciting and dynamic treatment option!



 $\label{prop:proton} \mbox{ After the conference, the leadership team visited the Scripps Proton Therapy Center.}$

Clinician and Group Consumer Assessment of Healthcare Providers and Systems (CGCAHPS)



As national healthcare legislation changes, UAB RadiationOncologyworkstonotonlymeetthose changes, but use them to benefit our faculty and patients. For example, we have adopted the Clinician and Group Consumer Assessment of Healthcare Providers and Systems, or CGCAHPS, survey to increase our practice's transparency and improve our clinical work. The CGCAHPS survey is a standardized tool developed by the Agency for Healthcare Research and Quality (AHRQ) to measure patient perceptions of care delivered by health care providers, such as physicians and nurses, in an office setting.

"The survey records the patient's overall experience over the past twelve months to establish a continuity of care," radiation oncology manager Kathy Bowman explained. "The survey monitors five domains: overall provider rating, access to care, test result follow-up, doctor/patient communication, and office staff helpfulness. The scores are organized by hospital, as well as regionally and nationally."

Currently, over 8,000 physician sites and more than 43,000 physicians are utilizing the CGCAHPS survey. CGCAHPS data has been uploaded to a national "Physician Compare" website. Patients can use this website to access the scores for any physician, including our own faculty, who sees more than 350 patients in a year. Patients will be able to use this information to make more complete and informed decisions concerning their healthcare choices.

"Patients want to know how effectively a physician communicates information, how quickly they order and share test results, and the overall quality of the treatment. What we are doing is posting these results to give them an indicator of quality," Bowman said. "Ultimately, that's what the patient is looking for. We all want the best experience for our time and money in everything. Healthcare is no different."

Our department is engaging deeply with this data, using it and follow-up information from past patients to inform and improve practice. Observing these items can pay off in multiple ways. Commonly-seen outcomes of CGCAHPS study include revised service initiative priority, greater outstanding staff recognition, and increased referrals.

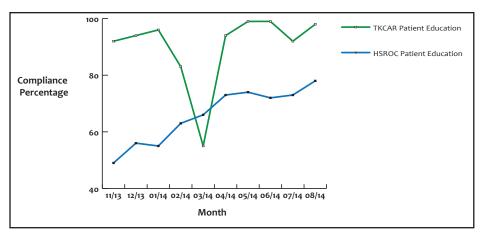


Figure 1: UAB Radiation Oncology's Patient Education Compliance Percentages

Since our adoption of CGCAHPS, this department has already gained a greater insight into patient needs.

"The Affordable Care Act calls for greater transparency from healthcare providers. These surveys give patients the ability to see the quality of our clinic," Bowman said. "Survey responses and comments also give us insight to new information on where we are excelling and where we can improve. It is an effective tool for helping us evaluate the services we provide."

As a result of CGCAHPS' close monitoring of patient satisfaction; both Hazelrig-Salter Radiation Oncology Center (HSROC) and the Kirklin Clinic at Acton Road (TKCAR) have made notable improvements in patient education and test result delivery. Hazelrig-Salter has implemented a test results pool, adding all test results to a patient's electronic charts. This ensured that physicians and nurses would see all new test results each time a patient was treated, regardless of a test's origin or purpose. Acton Road began discussing test purposes more fully with patients, explaining that some tests were purely diagnostic and would have not provided patients with any additional information on their treatment. These simple actions have greatly improved our physicians' ability to relay accurate and necessary information with our patient population.

CGCAHPS provides opportunities for both improved patient experience and clinical growth.

The survey's collected information provides us with new perspectives for improvement and review.Radiationoncologyhasalwaysmaintained a thorough review process, which has only been enhanced by adopting the CGCAHPS domains. Adopting these standards allows radiation oncologymanagementtomoreeasilyunderstand and share clinical data with other UAB Hospital departments.

"We have always had internal review, since we've always been interested in improving the patient experience. Now, we have a universal standard that can be easily compared to other healthcare providers," Bowman said. "UAB Hospital's internal review board gives us the opportunity to share how our practices can potentially be used to improve work in other departments, as well as provides advice and resources needed to improve our own practice."

The universal adoption of CGCAHPS provides our faculty and staff with invaluable information and resources. We are now capable of examining and sharing patient responses in an entirely new way. Armed with the knowledge derived from CGCAHPS, we are actively constructing improved clinical practice and patient interaction. Our increased focus on new patient responses, combined with our outstanding faculty, staff, and technology, will assist our department as we continue our world-class clinical practice.



Nursing is a demanding career, even in the best possible patient health scenarios. When faced with unique challenges like an unusually broad patient population, atypical patient care necessities, and a highly complex clinical specialty, the UAB Radiation Oncology nursing staff performs well above the call of duty. The nurses at the Hazelrig-Salter Radiation Oncology Center and the Kirklin Clinic at Acton Road tirelessly work to meet the needs of all their patients. They act as caregivers, educators, resources, and friends. The entire staff delivers outstanding care,

resources, and friends. The entire staff delivers outstanding ca even when facing cancer's harsh

and indiscriminate nature.

Radiation oncology nursing in our clinics is built upon thorough, comprehensive, and ongoing patient assessment.

"We see our patients once a week for an undertreat session with our physicians. Our treatment is very individualized," said nurse Sue Coleman. "If we have a patient who has been experiencing any kind of intense reaction to the treatments, we have them come by the nurses' station every day just



Nurse Sandy Brant cares for a patient

so we can make a constant assessment of them and immediately help with whatever needs they may have. Some patients have little to no side effects, while some come into the clinic needing further treatment. It requires us to be constantly observing and evaluating the needs of each patient."

This constant observation and evaluation requires vigilance from our nursing staff, which they provide without hesitation.

"I like to use the term 'not on my watch.' As long as I am here, I make sure that I don't miss anything and that nothing preventable will happen to the patients," said nurse Sandy Brant. "We tell patients that they can call us with any problems. This is good because some patients have to work very hard just to make it to see us."

Radiation oncology nursing has a very broad patient population when compared to other forms of nursing. This large patient populationrequires that our nurses managemultiple dimensions of patient care.

"Our scope of care is from six months all the way to geriatric populations. We are linked to the hospital, so we see follow-up 10 • RAYS OF HOPE

patients, new patients, and patients admitted from the central hospital for other treatments entirely," said nurse manager Trevor Lever. "It is a complex juggling act of prioritizing needs. Our staff does an excellent job of handling that."

This complex prioritizing is common both at HSROC and at Acton Road.

"The work here is more focused on patient care coordination. You

wear a lot more hats here than you do in the in-patient world," said Acton Road nurse Elizabeth Wilson. "Working in radiation oncology broadens your nursing practice because you are doing some things that are more like social work while still doing your clinical work. You develop a broader skillset in this kind of outpatient nursing."

This broader skillset often involves caring for children and other patients who have difficulty articulating their specific needs, concerns, and symptoms.

"When caring for children, the work is more focused on getting on their level. Something as simple as noticing their shoes or bringing up TV shows as a diversion can be huge for a child patient," Sandy mentioned. "We also have to focus on non-verbal communication. Some patients can have a hard time talking with us or sharing exactly what they need, so we have to pay close attention to motion, touch, and physical comfort."

This level of patient interaction naturally leads to very close bonds between nurses and patients.

"We build very close bonds with the patients since we are seeing them five days a week for up to seven weeks. You become very close with the patient and their family members. That adds to the level of trust and expectation. The patients truly trust us," Trevor said. "Since each of our nurses has a typical disease site they work with, they see their patients often and have more chances to make real bonds. That's one thing that makes radiation oncology different from other departments; we're seeing patients every day."

"We also make sure to remember that everyone has a life outside these doors. We always make sure to try and tap in to what that

person's life is really all about," Sandy said. "We work to treat everyone here as a king or a queen, no matter who they are."

Radiation oncology nursing has unique challenges caused by the nature of radiation therapy. Nutrition, hydration, and skin care are the most common areas of nursing concern with radiation therapy patients.

"We have a lot of concerns with nutrition for our patients, particularly our head and neck patients. We want to make sure they are getting adequate protein so they can repair tissue and adequate hydration. Most Americans are chronically dehydrated anyway, but our patients run a much larger risk of dehydration because of the radiation and chemo," Sue explained. "Skin care is a big issue as well because we are causing toxic effects to their skin. Mucositis is a large issue, especially with our head and neck patients. If it gets bad enough, it becomes very difficult for the patients to eat, drink, and get the nutrition they need to recover."

Our nursing staff works extremely closely with physicians, therapists, and dosimetrists. Nursing work is hugely impacted by the work of the other three groups, so constant communication is crucial. The nurses also communicate with each other, as any nurse can potentially work with any patient.

"We are communicating with our patients and making sure they are getting what they require. I am the point person for two specific physicians here, but I work with all the patients who come into the clinic. We all do. That's the only way this place works," Sue said. "You can't have 'your patients' and 'my patients.' They are all 'our patients.' The nurses usually know every patient who comes into the clinic. They are all our shared responsibility."



Nurse Manager Trevor Lever

This sense of shared responsibility is essential to the clinic's continued operation and effective patient care. "If someone happens to be busy but needs to attend to a patient, one of us is always happy to jump in and do whatever is needed. That's something that we always do together," Sandy mentioned.

"There are some times that we can immediately tell there has been a change in a patient just because we saw them the day before. In cases like that, you have to be ready to work immediately to help that patient deal with the changes," Sandy continued.

Our nursing staff also educates our patient population and the



Nurse Sue Coleman

general community. Many staff members teach patients and families prior to radiation therapy, lecture fellow nurses on cancer nursing, and present on current cancer treatment and nursing practices. This work is most commonly done at the American Cancer Society's Hope Lodge.

"Through the efforts of Janie Rothe, our social worker, we have been able to reach out to and educate patients who are beginning treatment. We go over skin care, pain control, nutrition, and fatigue management,"Trevor explained. "A lot of the time, patients don't fully understand what happens with radiation oncology, since it is extremely complicated. We are trying to get out into the community more and explain our work, even to other oncology doctors and nurses."

The nursing staff currently hosts these educational sessions once a month, but they are working to host them more frequently. Our nurses believe that if they can proactively educate the patient population, they can lessen instances of patient side effects. To increase their reach, our nurses are working with the UAB Comprehensive Cancer Center to organize more sessions with the region's cancer patient population.

Our nurses are extremely happy with their work. They all thrive in our clinical environment, enjoy the close connections they form with staff and patients, and see themselves continuing in this department for many years to come.

"I am very happy with the group that I work with. For me, it is not just a job. Before I entered nursing, I have had jobs where I thought 'I have to get up and go to work.' It's different here. I now think 'I get the chance to go to work," Sandy said. "Being with a patient, from the first consultation to the last follow-up appointments, is amazing. I am so proud that I work in this department. It is an absolute honor and privilege."

"I absolutely love my job. When you work this closely with so many people, they become a part of your family. That family atmosphere runs through the whole clinic," Sue agreed. "Even our patients can see it and become a part of it. In the 35 years I have worked in nursing, my five years here have been the most rewarding. I would never even think of working anywhere else."



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