Overview of Head and Neck Cancers

Types of Head and Neck Cancer

The majority of head and neck cancers (HNCs) (around 90%) arise in the squamous cells that line the moist mucosal surfaces of the oral cavity, pharynx, larynx, and paranasal sinuses and are referred to as squamous cell carcinoma of the head and neck (SCCHN). Tumors in these cosmetically or functionally important areas can affect the senses (taste, smell, hearing) and critical physiological functions (chewing, swallowing, breathing), as well as characteristics that help to define an individual (appearance, voice).

Thyroid carcinomas are quite different from SCCHNs in terms of etiology, treatment, and prognosis, but are frequently grouped with other HNCs because of their physical location. These tumors are of special interest because the observed incidence rate of thyroid carcinoma has increased significantly over the last 20 years. They are discussed in detail later in this issue.

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From the Medical Director

Can’t Stop the Music

The banner of this issue of CancerUpdate has changed and now highlights the Baylor Charles A. Sammons Cancer Centers. This change reflects the growth of our cancer center network that was highlighted in the fall 2012 issue. (All previous issues can be accessed on the web at http://www.baylorhealth.edu/Research/InstitutesCenters/Sammons/CancerUPDATE/Pages/default.aspx.)

The focus of this issue is on cancers that occur in the head and neck, including thyroid cancer. The epidemiology of squamous cell carcinoma of the head and neck is changing dramatically with decreases in the use of tobacco products and the emergence of human papillomavirus as a risk factor. Thyroid cancer has become one of the fastest growing cancers in terms of incidence and mortality. The articles reflect innovative work going on at several of our campuses and discuss some of the challenges that patients with these malignancies face. Exciting work is directed at improving functionality and quality of life in survivors of these cancers. Also in this issue and going forward, our standard sections—including new clinical trials, recent publications, site tumor conferences, special symposia, and new oncology physicians on the medical staff—will reflect the multiple institutions in the Baylor Charles A. Sammons Cancer Center network.

If you don’t have a chance to read anything else, I hope that you will have a chance to read the uplifting piece about a choir composed of laryngectomy patients who would not let that stop their love of music and song.

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Tumors that develop in the salivary glands or in the skin, soft tissue, bone, and neurovascular structures of the head and neck are also considered HNCs. These tumors tend to be less common and are not discussed here.

**Statistics**

It is estimated that approximately 54,000 new cases of SCCHN will occur in the United States in 2013. Of those, 60% to 70% will initially be diagnosed only after they have already metastasized to the lymph nodes or to different sites in the body. At this point, instead of the >80% 5-year survival seen in patients with localized disease, the average survival rates are reduced to around 60% in cases with regional spread and 35% in cases with distant metastases.

**Epidemiology**

Historically, SCCHN has been about twice as common in men as in women, and more frequent in people over 50 compared with younger people. This reflects the fact that alcohol and tobacco are common etiologic factors for SCCHN, linked to at least 75% of cases. This etiologic association includes smokeless tobacco and is strongest for people who use both alcohol and tobacco. Because of the nature of alcohol and tobacco use, the entire aerodigestive tract is exposed; thus, patients with a primary tobacco and/or alcohol-positive SCCHN are at increased risk for developing second primary neoplasms.

Since the 1960s, however, this epidemiologic picture has been slowly changing. During that decade, the surgeon general published a report about the link between cigarette smoking and lung cancer, leading to a gradual decline in smoking. Also beginning at about that time, the incidence of human papillomavirus (HPV) began increasing, and HPV, especially HPV-16, is now a well-accepted risk factor for SCCHN of the oropharynx, particularly of the palatine tonsils and the base of the tongue. Because of these changes, the demographics of the disease are now much different than they were even 15 years ago. SCCHN is gradually becoming a disease of younger people who don’t drink and have never smoked. There have not yet been any studies to test whether vaccines against HPV will protect against oropharyngeal cancers, but many physicians believe that they will.

Other risk factors for SCCHN are culturally related, including the use of paan (betel quid) in southeast Asia, heavy drinking of mate (a type of tea) in South America, and eating preserved or heavily salted foods in Japan. Asian ancestry, particularly Chinese, is a risk factor for nasopharyngeal cancer.

**Diagnosis**

Symptoms of SCCHN that may cause a patient to seek medical advice include a lump or sore that does not heal, persistent sore throat, difficulty swallowing, change in the voice, discolored patches in the mouth, swelling of the jaw, trouble breathing, or persistently blocked sinuses, among others. Diagnosis is usually made by a careful clinical examination, followed by (as needed) fiber-optic endoscopy, fine-needle aspiration or core biopsy of neck masses, additional biopsies under anesthesia, and imaging and laboratory studies.

**Curing or Controlling the Disease**

The aims of treatment are to cure or control the disease while preserving function and quality of life. For stage I/II SCCHN (a small primary tumor with no nodal involvement), this aim can typically be accomplished with single-modality treatment with surgery or radiotherapy. Surgery is still the main approach used for stage I tumors in the larynx and oral cavity. In general, however, the treatment of choice will depend on the location of the tumor. With advances made in the focused delivery of radiotherapy, it is possible to minimize side effects, for example, by avoiding the salivary glands and the muscles used for swallowing.

Early stage tumors comprise only about one-third of all newly diagnosed cases of SCCHN. For locally advanced tumors, which are larger and may have invaded underlying structures or spread to regional nodes, surgery is less useful as a single-modality therapy. In advanced cancers of the larynx or tongue, for example, total laryngectomy or glossectomy may cure the disease, but at significant cost in terms of preservation of function and quality of life. Numerous studies

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Eric Nadler, MD, MPP
since the 1990s have demonstrated that the concurrent use of chemotherapy and radiotherapy is very effective for both disease control and organ preservation. In addition to having cytotoxic properties of its own, chemotherapy serves as an augmenting agent for radiotherapy, sensitizing the tissue to radiation-induced damage. The standard therapy for patients with good performance status is concurrent cisplatin and radiotherapy, although category 1 evidence also supports the use of cetuximab or carboplatin/infusional 5-fluorouracil in combination with radiotherapy. Other studies have examined the idea of using induction chemotherapy for 3 cycles before concurrent chemoradiation or radiotherapy alone. Although recent reports suggest that such induction therapy may not confer an advantage, some practitioners believe it is a useful approach in patients who have exceptionally bulky disease or who have multiple lymph node levels involved.

For recurrent or metastatic SCCHN, the cornerstone of treatment is combination cytotoxic therapy that includes cisplatin or carboplatin and/or targeted agent therapy. Ideally, patients should consider enrolling in a clinical trial, several of which are now under way as part of the robust clinical research program at Baylor Charles A. Sammons Cancer Centers. Eric Nadler, MD, MPP, a medical oncologist on the medical staff at Baylor University Medical Center at Dallas, commented: “I think we have made some significant advances in our treatment of metastatic disease, both on research protocols as well as in sequencing conventional lines of treatment. These advances have clearly had advantages for our patients and encourage us to continue these investigations.”

Adverse Effects of Treatment for SCCHN
The treatment modalities used for SCCHN—surgery, radiotherapy, systemic therapy—can have significant adverse effects in addition to those resulting from the tumor itself. Surgery may result in cosmetic disfigurement, voice loss, numbness, and dysphagia, while radiotherapy and systemic therapy may generate significant toxicities, including pain, mucositis, xerostomia, taste changes, dysphagia, and aspiration.

Thus, even when the primary disease is well controlled, patients may be left with long-term sequelae from the cancer or its treatment that, in severe cases, can stigmatize and socially isolate them for the rest of their lives. It is small wonder, then, that both clinicians and their patients feel that quality of life issues are a critically important concern in the management of SCCHN.

Preserving Function and Quality of Life
As an expert in the construction of prosthodontic appliances for patients with SCCHN, Amerian Sones, DMD, MS, clinical assistant professor and director of continuing education at the Texas A&M Health Science Center Baylor College of Dentistry, is intimately associated with the problems involved in preserving function and quality of life for these patients. She said: “If our surgeons and oncologists are going to put so much effort into saving the lives of these patients, we want to put an equal amount of effort into ensuring that their quality of life makes it worthwhile.”

This effort comes from dentists, reconstructive surgeons, nutritionists, speech and swallowing therapists, and others working together with the surgical, radiation, and medical oncologists to find the best possible outcome for the patient. Typically, these health care professionals come together on a regular basis at multidisciplinary tumor conferences to plan and coordinate care. Head and neck tumor conferences are currently in place at sites within the Baylor Charles A. Sammons Cancer Center network. Lance Oxford, MD, otorhinolaryngologist on the medical staff at Baylor Dallas, is excited about the major advances made possible by this team treatment: “Patients have a whole team of professionals working closely in cooperation with each other. The outcomes have really improved; there are better cure rates as well as greatly improved morbidity. I look forward to further advances focusing on maximizing patient function.”

In this issue of CancerUpdate, we highlight treatment and services available for patients with SCCHN at the Baylor Sammons Cancer Centers, including innovative surgical approaches, craniofacial reconstructive techniques, prosthodontics, and dental services to meet the unique needs of SCCHN patients. We also review current treatment approaches being used for patients with thyroid carcinoma.
Surgery and Its Aftermath in Squamous Cell Carcinoma of the Head and Neck

Surgical resection of the primary tumor is a common and effective treatment option for the management of patients with squamous cell carcinoma of the head and neck (SCCHN). It can be used as a single-modality therapy for patients with stage I/II disease and in combination with other treatment modalities in patients with more advanced disease. Multidisciplinary evaluation and treatment coordination is required to select the best options for an individual patient.

Robert Steckler, MD, medical director of surgical oncology at Baylor Regional Medical Center at Plano and professor of dental oncology at Texas A&M Baylor College of Dentistry in Dallas, defines three broad areas of consideration in evaluating each patient:

1. Patient factors: age (physiologic), medical condition, place of residence, support system, nutritional status, ability to tolerate treatment.
2. Tumor factors: size, location, involvement of adjacent structures or bone, spread to regional lymph nodes, histology, previous treatment.
3. Treatment factors: What is available in the community, skills of the treatment team, support services.

If a patient is considered an appropriate candidate for surgery based on these factors, treatment planning commences. Treatment is selected by the surgical oncologist, in coordination with other specialists. Frequently, the case is presented at the head and neck tumor conference, which is regularly attended by plastic surgeons, dentists, radiation oncologists, medical oncologists, and speech and physical therapists.

Primary Surgery
The goal of the initial surgery is to resect the primary tumor with adequate surgical margins. Many very small tumors will be resectable using minimally invasive techniques, such as a transoral approach with endoscopy, lasers, or robotics. For larger tumors judged to be resectable, more traditional open approaches may be used to obtain complete removal.

In addition to removal of the primary tumor, metastatic lymph nodes in the neck must also be removed. As Yadro Ducic, MD, FRCS(C), FACS, medical director, Skull Base Center, Baylor All Saints Medical Center at Fort Worth, and an otolaryngologist on the medical staff at Baylor All Saints Medical Center at Fort Worth, commented: “We lose the battle if there is metastatic disease in the neck and we are not aware of it. But as a rule, we no longer need to do comprehensive neck dissections to achieve this goal. We are more likely to do a selective dissection based on our knowledge about how these tumors typically spread to the regional nodes. This allows us to achieve good oncologic results while preserving more of the structures in the neck.” Selective dissections are often recommended for patients with no clinical evidence of nodal involvement (N0) and may also be appropriate for some patients with N1 or N2 disease to prevent morbidity. For patients with N3 disease (a metastatic lymph node >6 cm), a comprehensive neck dissection is usually still recommended.

As a part of treatment planning, the surgical oncologist will consider what will need to be done to restore function and cosmesis and thus ensure a reasonable quality of life for the patient. In some cases, this will require close collaboration with a plastic surgeon who specializes in head and neck reconstructions. In others, restoration of function and cosmesis may be better achieved with the use of a prosthodontic appliance.

Reconstructive Surgery: The Role of the Plastic Surgeon
The treatment of SCCHN has progressed to the point where immediate reconstruction is not only possible but often appropriate. Thus, reconstructive surgery is carried out in conjunction with the original surgery, so that healing can occur well before the initiation of radiotherapy. An important advance in the last 10 years has been the introduction of medical modeling to assist in the planning of the reconstruc-
Joshua Lemmon, MD, a reconstructive plastic surgeon on the medical staff at Baylor Regional Medical Center at Plano, explained this new technology: "Medical modeling allows us to use a CT [computed tomography] scan to make an exact model of the area that will need reconstruction after surgery. After the virtual model is created, the digital file is sent to what is essentially a 3D printer to produce the final model in physical form. Using this physical model, the initial surgery and the reconstructive surgery can then be precisely planned in advance, down to the exact angle of bone cuts to be made to optimize the reconstruction." (Figures 1A–C)

The most commonly performed reconstructive surgeries use autologous free tissue flaps. Free radial forearm flaps, with soft tissue that is thin and pliable, are used for reconstructions of the tongue, inside of the cheek, or floor of the mouth. The flap is removed with an attached artery and vein, which are then anastomosed to an artery and vein in the neck to ensure good circulation in the flap. If a flap with more fullness is needed—for example, if the entire tongue has been removed—the plastic surgeon may use an anterior lateral thigh flap or a rectus abdominis flap. For smaller flaps, the donor site can frequently be directly closed, while larger flaps may require a skin graft. (Figures 2A–C)

Free fibula flaps are used in cases where cancer has invaded the bone and the mandible needs to be removed. The fibula is used because it is not weight-bearing. A portion of the fibula with attached artery and vein is used to fill the defect in the jaw bone. This surgery results in excellent functional outcomes, with patients able to talk and eat after recovery.

A major development on the horizon for reconstructive surgery is the use of composite tissue allograft transplantation. This is a construct of skin, muscle, tendon, nerves, bone, and blood vessels from another person that could be used to restore large tissue defects resulting from surgical resection of head and neck tumors. Such a transplant could achieve a near-perfect match of facial skin texture, pliability, and color, as compared with autologous transplants taken from other parts of the patient’s body. Currently, the use of allografts in patients with head and neck cancer is problematic, because the immunosuppressive medications needed to prevent transplant rejection could increase the incidence of recurrence or secondary malignancies. Researchers are investigating ways to induce immunologic tolerance for allografts that would lessen the requirement for these medications.

**Prosthodontic Options**

Reconstructive surgery is not the only option for reconstruction in patients with SCCHN. Because of poor health, advanced age, or a high probability of tumor recurrence, some patients may be better suited for maxillofacial prosthodontic reconstruction. The goal of oral and maxillofacial prosthodontics is to rehabilitate patients who suffer hard and soft tissue defects as a result of surgical resection of head and neck cancer. Prosthodontic rehabilitation requires little
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Yadro Ducic, MD, FRCS(C), FACS

or no additional surgery and may provide better cosmetic outcomes in some cases, restoring function, esthetics, and self-confidence.

A patient for whom a defect of the hard or soft palate is anticipated as a result of surgery should be examined by a prosthodontist. Such a defect, if left untreated, would result in hypernasal speech, fluid leakage through the nose, and inability to function. An impression of the area is made prior to surgery and a stone cast is fabricated to make an immediate surgical obturator for the dental arch. This obturator is delivered in the operating room during the time of surgery. It can include denture teeth to provide immediate esthetics and occlusion for the patient. The presence of the appliance provides numerous benefits for the patient in the immediate postsurgical period, including the ability to speak intelligibly and drink fluids through a straw. Being able to communicate and function contributes to the patient’s psychological well-being. An interim obturator that is realigned periodically to adapt to the healing process is used until the surgical site is completely healed and any adjunctive radiation or chemotherapy treatment is complete. A definitive obturator is fabricated and installed when the patient has completed treatment and is tumor free. According to Amerian Sones, DMD, MS, clinical assistant professor and director of continuing education at the Texas A&M Health Science Center Baylor College of Dentistry, “We work to make the obturator as comfortable as possible. The patient’s appearance improves, function improves, and the ability to speak properly is regained. Without the obturator inserted, speech is almost unintelligible.” (Figures 3A–E)

A potential difficulty with the use of oral appliances for those patients receiving postsurgical radiation is the development of trismus, or limited opening of the mouth. Radiation-induced contraction or fibrosis of the masticatory muscles can begin 2 to 3 weeks into radiation and may continue for 3 to 4 months after the completion of treatment. With severe trismus, the patient will be unable to insert the obturator. In addition, it becomes extremely difficult to provide dental restorative care if needed. Jaw stretching exercises to activate the jaw opening muscles are provided to the patient to perform during and after treatment to reduce the incidence and severity of trismus.

Xerostomia, or dryness of the mouth, can occur during and after radiotherapy and is especially prominent with combined radiation.

Figure 2A. Hemiglossectomy performed for removal of squamous cell carcinoma involving the ventral side of the tongue and the floor of the mouth.  

Figures 2B–C. Free forearm flap with attached artery and vein removed from the forearm for reconstructive surgery.
radiation and chemotherapy. The dryness of the mouth, besides making the teeth increasingly susceptible to caries, results in increasing difficulty in wearing the prosthesis comfortably.

Auricular, ocular, and nasal prostheses are used for cosmetic replacement in patients with surgical resection of an ear, eye, or nose subsequent to resection of a tumor. If an ear is to be removed, an impression is taken before surgery and 3-D imaging is used to create a wax image of the ear. An auricular prosthesis is then fabricated using medical-grade silicone. The prosthesis can be attached via medical-grade adhesive, or with dental implants attached with abutment magnets that anchor the prosthesis to the cranium. Similarly, for a patient with a tumor extending into the orbital cavity, an orbital prosthesis may be constructed and fitted with an ocular prosthesis.

**Hope for the Future**
The decision to pursue surgical reconstruction versus prosthodontics in patients with SCCHN is made as a result of multidisciplinary consultation with other cancer professionals as well as the preference of the patient. Since the majority of these tumors are not discovered until they are fairly advanced, developments in both of these areas will be aimed at improving function, cosmesis, and overall quality of life for patients who have undergone disfiguring surgery to cure their cancer.

The real hope for the future, however, is to educate the public about the changing picture of care for this often terrifying disease, so that they will seek medical care sooner when the cancers are less advanced. According to Dr. Ducic: “Twenty years ago, we didn’t use reconstruction, and horrible cosmetic results were very common. The perception of many people out in the community continues to be that a diagnosis of head and neck cancer will lead to mutilation, so they don’t come in to get things checked out. Any lump or sore in the head that doesn’t go away after a couple of weeks needs to be checked by a doctor, and as we educate people about what we are doing these days to preserve function and appearance, the hope is that they will do so.”

**Figures 3A–E.** Construction and fitting of a maxillary obturator in a patient treated with surgery and radiotherapy for a squamous cell carcinoma of the maxillary right hard palate. Pre-treatment dental consultation with follow-up was very important to the patient’s well being and quality of life after the surgical site was healed and radiotherapy was complete.

**Figure 3A.** Squamous cell carcinoma of the maxillary right hard palate

**Figure 3B.** Surgical resection of the maxillary hard palate and alveolar ridge

**Figure 3C.** Final cast with definitive maxillary removable partial framework of chrome cobalt

**Figure 3D.** Final maxillary obturator with heat processed acrylic distal extension

**Figure 3E.** Patient with definitive maxillary obturator in place
The North Texas Laryngectomy Choir: Bringing Courage and Gratitude Together

An integral part of the treatment program for head and neck cancer patients following surgery is rehabilitation. This rehabilitation is especially important for patients who have undergone a laryngectomy and must relearn how to do very simple tasks, such as swallowing and speaking.

In an effort to provide the best support and care for their patients, Katrina M. Jensen, MA, CCC-SLP, director of Medical Speech Pathology for Yadro Ducic, MD, an otolaryngologist on the medical staff at Baylor All Saints Medical Center at Fort Worth, started an informational webpage as an educational resource for head and neck cancer patients. Realizing that their patients needed more, she founded the North Texas Laryngectomy Society (NTLS), currently the largest support group for laryngectomy patients in North Texas. They hold monthly meetings as well as monthly social events for members and their families. An offshoot of the NTLS is the NTLS Choir, which has been performing in the community since 2011.

One of the first of its kind in the country, the NTLS Choir provides a unique source of rehabilitation and support for laryngectomy patients. With practice, they are able to better develop their new voice, including modulation, pitch, and control. Instead of becoming socially isolated because they cannot communicate and feel disfigured, the support helps

Katrina M. Jensen, MA, CCC-SLP, director of Medical Speech Pathology (holding violin), along with the members of the NTLC.
Instead of becoming socially isolated because they cannot communicate and feel disfigured, the support helps them to resume productive lives, doing many of the same things they did before surgery. They call it learning how to live with the “new normal.”

The NTLS Choir has given performances throughout North Texas, singing at such events as the 23rd Annual Texas Laryngectomy Association Conference held this past March in Dallas, Texas. This program has been so successful that other groups from across the country have come to NTLS for advice on how to start their own laryngectomy choir. None of this success would have been possible without the time and dedication put in by Katrina. She has traveled throughout the country and the world giving presentations on best practices for patient rehabilitation. Currently, she is writing a book on laryngectomy rehabilitation, with many of her patients volunteering to serve as models for the book.

What sums up Katrina best is a comment made by her son. One day when they were talking, her son said, “Mom, your life is all about cancer.” When she thought about it, she realized it was true. As a medical speech pathologist, her role is not that of a normal speech pathologist. Rather than teaching children how to speak, she is teaching people how to speak again, but in a way that differs dramatically from their former way of speaking. Based on the growth of both the support group and the choir, she is extremely successful in helping people get on with their “new normal” lives.
The Unique Dental Needs of Patients with Head and Neck Cancer

In addition to the physical damage caused by extirpative surgery, patients with squamous cell carcinoma of the head and neck (SCCHN) are at high risk for oral complications as a result of treatment with radiotherapy and chemotherapy. These complications can be mitigated to some extent through the use of specialized dental services before, during, and after treatment.

Oral Complications Related to Therapy for SCCHN
What types of oral complications are commonly seen?

- Radiotherapy to the head and neck area, even with newer modalities (intensity-modulated radiation therapy, proton beam), still has a dramatic effect on the mouth, causing some degree of xerostomia in nearly all patients. Chemotherapy can have a similar effect in up to 40% of patients, although xerostomia usually resolves sooner in these cases. Because saliva is a natural cleanser of the mouth, the dryness can result in rampant tooth decay and gum disease.

- Patients with SCCHN frequently get radiation to the mandible or maxilla, with the teeth, bone, and gums directly in the pathway. The radiation reduces the blood flow to the bone, especially the mandible. The affected bone can be fragile and painful and has a reduced ability to heal from trauma (e.g., tooth extractions or dental implants) or future infections. Such insults may lead to osteoradionecrosis, which is generally incurable and extremely difficult to treat. (Figure 4A)

- The oral mucosa is especially vulnerable to chemotherapy- or radiation-induced mucositis, a painful ulcerative condition that results from a breakdown of the epithelial cells lining the gastrointestinal tract. Mucositis can result in nutritional problems due to an inability to eat as well as infections caused by the open sores. This condition can affect quality of life to the extent that it becomes dose-limiting. (Figure 4B)

- Radiotherapy can cause contraction of the masticatory muscles, resulting in trismus. As long as 3 to 4 months after the completion of radiotherapy, this condition may worsen to the point that the mouth can no longer be opened.

Specialized Dental Care to Mitigate Oral Complications
At Baylor Charles A. Sammons Cancer Center at Dallas, a dedicated dental clinic is focused on meeting the unique dental and oral health care needs of cancer patients. Under the medical direction of Kenneth Bolin, DDS, associate professor of public health sciences at Texas A&M Health Science Center Baylor College of Dentistry, this clinic features two dental treatment rooms located in the outpatient oncology clinic of Baylor Sammons Cancer Center at Dallas. Dr. Bolin is assisted by Jane Cotter, RDH, MS, a full-time master’s-level hygienist and former assistant professor in the Caruth School of Dental Hygiene at Texas A&M Health Science Center Baylor College of Dentistry. The clinic also has a care coordinator, a dental assistant, and four part-time doctors. (Figure 5)
A patient with HNC ideally first comes to the clinic 2 to 3 weeks prior to beginning radiotherapy and/or chemotherapy. Historically, the standard of care was to extract all of the teeth at this visit. Now, the goal is to preserve as many teeth as possible, while eliminating only the teeth that are likely to cause problems during or after radiation treatment. Using low-dose digital diagnostic X-rays and a thorough clinical examination, the dental team identifies potential problems and uses quick and minimally invasive treatment to get the patient stabilized for chemotherapy and radiation. Teeth are cleaned, existing infections are treated, cavities are filled, and when necessary, some teeth may be removed. The 2- to 3-week timeframe allows sufficient time for healing from any procedures before the initiation of cancer treatment. Patients receive education about maintaining a high level of oral hygiene during and after their treatment, receiving adequate nutrition, and avoiding tobacco and alcohol.

Custom-made protective mouthguards can be made in the clinic to protect the teeth during radiation treatment. This is especially important if the patient has an extensive amount of metal restorations, as the radiation is liable to refract off the metal and cause tissue burns. The custom mouthguards are also used to deliver a special fluoride gel to the teeth to protect against demineralization. Patients with radiation-induced xerostomia may need to continue daily fluoride application for the rest of their lives in order to preserve their teeth.

During treatment, the patient can return to the clinic as needed for regular cleaning and examination and for the treatment of emergent problems. Patients who develop mucositis are guided through a range of treatments, beginning with over-the-counter products to soothe the mouth and progressing to prescription rinses and ointments, and if necessary, prescription analgesics. The dental professionals at the clinic also monitor the patient for the development of trismus and work closely with speech and physical therapists to provide exercises to help stretch and elongate the muscles during and after treatment. With careful attention to this regimen, some movement can be regained.

With long-term sequelae such as xerostomia carrying the possibility of significant infection and tooth decay, patients are followed every 3 months to have their teeth checked and cleaned. According to Ms. Cotter: “In our clinic, patients with head and neck cancer who have been treated with radiotherapy are recognized to be lifelong patients. Careful attention to long-term treatment effects can significantly improve their quality of life.”

The dental clinic at Baylor Sammons Cancer Center at Dallas has been open for more than 2 years. Because the staff are only able to see patients through physician referrals to the clinic, they are working hard to ensure that clinicians are aware of the services they provide. Dr. Bolin commented: “We would like all physicians here to be aware that these services are available and easily accessible to their patients. Ideally, we would like to see every patient with head and neck cancer who is going to receive radiation and/or chemotherapy prior to the start of their cancer treatment. We welcome referrals for pretherapy assessment and for the treatment of oral complications during or after treatment.”

Figure 5. Clinic medical director Kenneth Bolin, DDS, and hygienist Jane Cotter, RDH, MS, in a dental treatment room in the dental clinic at Baylor Charles A. Sammons Cancer Center at Dallas.
Thyroid Carcinoma

The thyroid is a large, butterfly-shaped endocrine gland located below the thyroid cartilage. Its two lobes are connected by an isthmus located inferior to the cricoid cartilage. Approximately 60,000 new cases of thyroid cancer and 1,850 deaths from this disease will occur in 2013.

Unlike many solid tumors for which increasing age is a risk factor (e.g., breast cancer), these tumors are more common in younger adults, with nearly two-thirds occurring in people younger than 55 and about 2% occurring in children and teens. Nearly three times as many women (both pre- and postmenopausal) as men are affected.

Follicular cells in the thyroid make thyroid hormone, which helps to regulate metabolism. C cells (parafollicular cells) produce calcitonin, which is involved with calcium metabolism. Several types of thyroid carcinoma arise from these different cell types, with disease-specific incidence rates and prognoses.

Types of Thyroid Carcinoma

Differentiated thyroid carcinomas (so called because the cells microscopically resemble normal thyroid cells) develop from the follicular cells. The most common type, comprising about 80% of all thyroid carcinomas, is papillary thyroid carcinoma. This cancer tends to grow slowly and is often multifocal. Papillary thyroid cancer frequently metastasizes to lymph nodes in the neck. The average 5-year survival rate for early stage (I/II) disease is nearly 100%, dropping to 93% for stage III and 51% for stage IV. The tall-cell variant of papillary thyroid carcinoma is much more aggressive, with a worse prognosis.

Follicular thyroid carcinoma is less common in the United States (approximately 10% of all thyroid carcinomas), but tends to be more common in countries where diets are iodine-deficient. These cancers rarely metastasize to the lymph nodes, instead tending to move to the lungs or bones. The prognosis is slightly worse than that of papillary thyroid carcinoma, with 5-year survival rates near 100% for stage I/II, 71% for stage III, and 50% for stage IV.

Hürthle cell carcinoma, a variant of follicular thyroid carcinoma, comprises 5% of all thyroid malignancies. Unlike follicular thyroid carcinoma, Hürthle cell carcinomas are often multi-focal, metastasize to lymph nodes, and often fail to concentrate radioactive iodine. In addition, patients with Hürthle cell carcinoma experience higher tumor recurrence rates and lower survival rates than patients with papillary thyroid carcinoma or follicular thyroid carcinoma.

Medullary thyroid carcinoma (MTC) develops from C cells that normally produce calcitonin. These tumors often release too much calcitonin, which can be detected in the peripheral blood. MTC accounts for 5% of all cases of thyroid carcinoma. About 15% to 20% of cases of MTC are familial and linked to a specific gene mutation; the remainder appear to be sporadic. The prognosis for early stage disease is very good, with a 5-year survival rate ≥98%. This prognosis quickly worsens in later-stage disease, however, with 5-year survival for stage IV disease at 28%.

Anaplastic carcinoma (also called undifferentiated carcinoma) is a rare (comprising about 2% of all thyroid carcinomas) and extremely aggressive disease. It metastasizes very quickly, and all cases are usually classified as stage IV. The 5-year survival rate is only 7%.

Genetic Mutations Associated with Thyroid Carcinoma

Nearly all patients with the inherited form of MTC and 10% of those with the sporadic form carry a specific mutation in the RET gene that is normally associated with cell division and growth. This association has fueled the drive to identify other mutations associated with thyroid carcinogenesis, but this effort is still in its early stages. In papillary thyroid carcinoma, additional gain of function mutations in specific parts of the RET gene have been found in 10% to 30% of cases, but these mutations are distinct from the mutation associated with MTC. Mutations in the BRAF gene are also very common in papillary
thyroid carcinoma, where they are associated with increased aggressiveness of the disease. Other involved genes may include NTRK1 and MET. RAS mutations have been observed in follicular carcinoma and mutations in TP53 and CTNNB1 in anaplastic carcinoma.

Detecting Thyroid Carcinoma: An Explanation for Increased Incidence?
The reported annual incidence of thyroid carcinoma has been increasing for several decades and is now twice what it was in 1990. Nearly 90% of this increase consists of small papillary thyroid carcinomas, less than 2 cm in size. While some as yet unidentified environmental triggers may explain some of this increase, most practitioners believe that some or all of it is due to better technology in use to detect the lesions.

A suspicion of thyroid carcinoma is usually prompted by patient complaints about physical symptoms: a lump or swelling in the neck, pain in the front of the neck, persistent hoarseness or other voice changes, trouble swallowing, trouble breathing, or a persistent cough. The physician performs a careful clinical examination and can sometimes palpate a nodule on the thyroid gland. Twenty-five years ago, a diagnosis of thyroid carcinoma would usually be made only when the nodule was palpable. Unfortunately, according to Raphaelle Vallera, MD, an endocrinologist on the medical staff at Baylor University Medical Center at Dallas, “You often can’t feel them. Depending on where the nodule is located in the gland, even relatively large tumors can go undetected by physical examination.” Even when a nodule is palpable, it may not be cancerous. Nodules are quite common, and less than 10% are malignant.

This picture changed significantly with improvements in ultrasound and cytology. Ultrasound is now widely used to detect suspicious lesions based on abnormal calcifications, abnormal vascularity, or evidence of invasion. In fact, many thyroid nodules are found incidentally during ultrasound scans done for other purposes, e.g., carotid scans of the neck. If a suspicious lesion is discovered, the next step is biopsy of the nodule using fine-needle aspiration. In this arena, according to Lawrence Weprin, MD, chief of otolaryngology and head and neck surgery at Baylor Dallas, “The quality of cytologic evaluation has improved dramatically. With this and the improvements in ultrasound, we are just getting much better at diagnosing thyroid cancer.” (Figures 6A–B and Figures 7A–B)

Figures 6A–B. This nodule is a mixed cystic and solid lesion that is predominantly hypoechoic with an irregular anterior border and no definite microcalcifications. The irregular anterior border is the most suspicious finding for malignancy.
Ultrasound is also used to examine the lateral neck for possible lymph node involvement. According to Christine Landry, MD, a surgical oncologist on the medical staff at Baylor Dallas, “I examine the lymph nodes in the lateral neck for every patient diagnosed with thyroid cancer. If there is a suspicious lymph node on ultrasound, fine-needle aspiration is performed to determine if the cancer has spread to these lymph nodes. This information, along with a CT [computed tomography] scan of the neck, is useful to determine the extent of surgery required to remove all of the cancer.”

Treating Thyroid Carcinoma Surgery
For most cases of differentiated thyroid carcinoma, the primary treatment is thyroidectomy. If the results of pathology are ambiguous, a partial thyroidectomy (lobectomy) may be performed initially, with completion surgery carried out if final pathology demonstrates malignancy. Typically, the surgery is performed with an incision in the neck to directly access the thyroid gland. Alternate approaches (transaxillary, endoscopic with a smaller incision) are available at a few centers, but are of potential use for only a limited number of patients. For example, there is a possibility of keloid scar formation associated with some ethnic backgrounds (African American, Asian), and such patients might prefer a less visible placement for the incision.

Historically, it was common practice to remove all the lymph nodes of the lateral neck on the side of the primary tumor, especially in MTC. Recently, however, more selective lymph node dissections have been used. At Baylor Dallas, surgeons on the medical staff are working with interventional radiologists who use ultrasound-guided dye injection to tag metastatic/suspicious nodes in the neck. The marked nodes can then be readily identified and selectively removed during regional lymph node dissection. The use of this more limited surgery is associated with cure rates equivalent to those for radical dissections and allows preservation of structures in the neck.

After Surgery: Additional Treatments for Thyroid Carcinoma
For small, localized, differentiated carcinomas, resection of the tumor may be adequate treatment to ensure a good outcome. However, if the tumor is multifocal, large, has extrathyroidal extension, or has spread into the lymph nodes, radioactive ablation with iodine-131 (I-131) may be used to

Figures 7A–B. This nodule is relatively isoechoic with respect to the adjacent thyroid tissue. There is a well defined, hypoechoic rim without definite microcalcifications. There are no specific sonographic findings to indicate malignancy, but this nodule would be biopsied due to its size.
seek out and destroy any remaining tumor cell deposits. Differentiated thyroid cancers are usually very receptive to I-131, but its effectiveness requires high levels of thyroid-stimulating hormone (TSH) in the blood to stimulate the cells to take up the radioactive iodine. Patients who have undergone a thyroidectomy are typically on high doses of thyroid hormone, which prevents the pituitary gland from releasing TSH. Two options are possible. The patient can stop taking thyroid hormone pills for several weeks, but this may cause symptoms of hypothyroidism in some patients, including fatigue, depression, or worsening of cardiovascular conditions. Alternatively, the patient can be put on Thyrogen®, a human recombinant form of TSH. Both methods have shown comparable success rates in radioactive iodine ablation.

External beam radiation may be used in addition to I-131 in cases of papillary thyroid carcinoma where there is extensive extrathyroidal tissue involvement that does not concentrate iodine. Few data are available to support the efficacy of radiotherapy as adjuvant therapy in other types of thyroid carcinoma.

Long-term management of thyroid carcinoma usually involves higher than normal doses of thyroid hormone to (1) replace the natural hormone and (2) suppress the regrowth of any residual thyroid cells.

What About Systemic Therapy?
Standard chemotherapy is not widely used in the treatment of thyroid carcinoma, with the exception of recurrent or metastatic disease that no longer responds to other treatment. Chemotherapy may also be used in combination with radiotherapy for anaplastic carcinoma. Most chemotherapy regimens are available only in clinical trials, with very few centers nationwide participating.

With the burgeoning knowledge about the molecular nature of these diseases, there is hope that new therapies targeted to specific gene mutations may be efficacious in cancers that do not respond to thyroid hormone-based treatments, including radioactive iodine. This includes most cases of MTC as well as differentiated cancers that no longer respond to I-131. In both types of iodine-resistant cancer, there is early promise for agents such as vandetanib, cabozantinib, sorafenib, and sunitinib, all of which are small-molecule tyrosine kinase inhibitors that target proteins involved in cell growth and division, including RET and MET.

Special attention has been focused on BRAF, as mutations in the BRAF gene occur frequently in papillary thyroid carcinoma, where they are associated with increased aggressiveness. Drugs that specifically target the BRAF pathway, including vemurafenib, dabrafenib, and selumetinib, are currently under study. In particular, several studies are examining whether drugs that target the BRAF pathway can make thyroid cancer cells more likely to take up radioactive iodine. The use of BRAF status of thyroid nodules as a diagnostic tool is also being investigated.

New Directions
Understanding the molecular biological basis of thyroid cancers will assist in finding effective new therapies, but it may also provide clinicians with a more precise estimation of prognosis for these diseases. For example, although most early stage papillary thyroid carcinomas are relatively indolent, some are not, and there is no accurate way to sort out aggressive versus nonaggressive tumors at this stage. The discovery of a particular gene mutation or combination of mutations that is associated with tumor prognosis would allow clinicians to more confidently select a treatment regimen for a specific patient. Such approaches are available for some other solid tumors (e.g., breast cancer).

For now, the treatment standards already in use, although possibly overtreating some patients, have yielded good outcomes. Dr. Weprin commented: “Our ability to diagnose thyroid carcinoma early has improved dramatically. Because of this, the current standard of care produces excellent results, with cure rates approaching 99% in patients with early stage disease. I am very optimistic that the majority of patients I treat will do well.”
# New Clinical Trials at Baylor Charles A. Sammons Cancer Centers

<table>
<thead>
<tr>
<th>Site</th>
<th>Study ID</th>
<th>Location</th>
<th>Principal investigator</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast</td>
<td>12120</td>
<td>Texas Oncology–Dallas</td>
<td>Cynthia Osbourne, MD</td>
<td>A phase III randomized, double blind, placebo controlled study of BKM120 with fulvestrant, in postmenopausal women with hormone receptor-positive HER2-negative AI treated, locally advanced or metastatic breast cancer who progressed on or after mTOR inhibitor based treatment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texas Oncology–Fort Worth</td>
<td>Cristi L. Aitelli, MD</td>
<td></td>
</tr>
<tr>
<td>GI</td>
<td>013-021</td>
<td>Baylor Dallas</td>
<td>James Fleshman, MD</td>
<td>A phase III prospective randomized trial comparing laparoscopic-assisted resection versus open resection for rectal cancer</td>
</tr>
<tr>
<td>GU</td>
<td>12118</td>
<td>Texas Oncology–Dallas</td>
<td>Thomas O. Hutson, DO</td>
<td>A multicenter phase II, randomized, double-blind, efficacy and safety study of enzalutamide versus eicalutamide in men with prostate cancer who have failed primary androgen deprivation therapy</td>
</tr>
<tr>
<td>GU</td>
<td>012-272</td>
<td>Baylor Dallas</td>
<td>Thomas O. Hutson, DO</td>
<td>A phase I study of BPX-201 vaccine plus AP1903 in patients with metastatic castrate resistant prostate cancer (mCRPC)</td>
</tr>
<tr>
<td>Hematology</td>
<td>012-202</td>
<td>Baylor Dallas</td>
<td>Estil A. Vance, MD</td>
<td>A randomized, double-blind, placebo-controlled, phase 3 study of CH-P and brentuximab vedotin versus CHOP in the front-line treatment of patients with CD30-positive mature T-cell lymphomas</td>
</tr>
<tr>
<td>Hematology</td>
<td>012-243</td>
<td>Baylor Dallas</td>
<td>Alan M. Miller, MD, PhD</td>
<td>Pilot study exploring IDH1/2 and 2-HG as diagnostic tool in AML patients</td>
</tr>
<tr>
<td>Hematology</td>
<td>012-229</td>
<td>Baylor Dallas</td>
<td>Moshe Levy, MD</td>
<td>An open-label, randomized phase III study of inotuzumab ozogamicin compared to a defined investigator’s choice in adult patients with relapsed or refractory CD22-positive acute lymphoblastic leukemia (ALL)</td>
</tr>
<tr>
<td>Hematology</td>
<td>012-217</td>
<td>Baylor Dallas</td>
<td>Joseph W. Fay, MD</td>
<td>A phase II, randomized, double-blind, placebo-controlled, multicenter study of siltuximab (anti-IL-6 monoclonal antibody) in subjects with high-risk smoldering multiple myeloma</td>
</tr>
<tr>
<td>Site</td>
<td>Study ID</td>
<td>Location</td>
<td>Principal investigator</td>
<td>Title</td>
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<tr>
<td>Hematology</td>
<td>013-050</td>
<td>Baylor Dallas</td>
<td>Barry Cooper, MD</td>
<td>A phase III, randomized, controlled study evaluating the efficacy and safety of GS-1101 (CAL-101) in combination with bendamustine and rituximab for previously treated indolent non-Hodgkin lymphoma</td>
</tr>
<tr>
<td>Lung</td>
<td>012-199</td>
<td>Baylor Dallas</td>
<td>Kartik Konduri, MD</td>
<td>A phase III randomized trial of adjuvant chemotherapy with or without bevacizumab for patients with completely resected stage IB (&gt; 4 cm) - IIIA non-small cell lung cancer (NSCLC)</td>
</tr>
<tr>
<td>Lung</td>
<td>12122</td>
<td>Texas Oncology–Dallas</td>
<td>Kartik Konduri, MD</td>
<td>An open-label, multicenter, phase IB/II study to evaluate necitumumab in combination with gemcitabine and cisplatin in the first-line treatment of patients with advanced (stage IV) squamous non-small cell lung cancer (NSCLC)</td>
</tr>
<tr>
<td>Lung</td>
<td>12195</td>
<td>Texas Oncology–Plano</td>
<td>Christopher T. Stokoe, MD</td>
<td>A randomized, open-label phase II study of EC145 single-agent and the combination of EC145plus docetaxel versus docetaxel alone in participants with folate-receptor positive [FR(++)] second line NSCLC</td>
</tr>
<tr>
<td>Neuro-Oncology</td>
<td>12136</td>
<td>Texas Oncology–Grapevine</td>
<td>Stephen D. Sorgen, MD</td>
<td>Phase II double-blinded placebo-controlled study of bevacizumab with or without AMG 386 in patients with recurrent glioblastoma or gliosarcoma</td>
</tr>
<tr>
<td>Neuro-Oncology</td>
<td>12136</td>
<td>Texas Oncology–Fort Worth</td>
<td>Ajay Dubey, MD</td>
<td>Phase II double-blinded placebo-controlled study of bevacizumab with or without AMG 386 in patients with recurrent glioblastoma or gliosarcoma</td>
</tr>
</tbody>
</table>

### Online Access to Clinical Trials

Physicians and their patients can now access information about open clinical trials in oncology at Baylor Sammons Cancer Center by following these steps:

- Go to BaylorHealth.edu/Sammons.
- Click on “Cancer Clinical Trials” on the right-hand menu.
- From the list of studies that appears, click on the study that is of interest to you to view details such as the inclusion/exclusion criteria.

For additional details or questions about the studies, please contact the Office of Clinical Oncology Research Coordination at 214.818.8472, 817.698.8472 or via e-mail at cancer.trials@baylorhealth.edu.
<table>
<thead>
<tr>
<th>Site</th>
<th>Study ID</th>
<th>Location</th>
<th>Principal investigator</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>Pancreas</td>
<td>12237</td>
<td>Texas Oncology–Dallas</td>
<td>Carlos H. Becerra, MD</td>
<td>A phase II, randomized, multicenter study of PEGPH20 (PEGylated recombinant human hyaluronidase) combined with nab-paclitaxel plus gemcitabine compared with nab-paclitaxel plus gemcitabine in subjects with stage IV previously untreated pancreatic cancer</td>
</tr>
<tr>
<td>Skin</td>
<td>T0-1219</td>
<td>Texas Oncology–Dallas</td>
<td>Charles L. Cowey, MD</td>
<td>A multicenter, open label, randomized phase II trial of the MEK inhibitor pimasertib or dacarbazine in previously untreated subjects with n-ras mutated locally advanced or metastatic malignant cutaneous melanoma</td>
</tr>
<tr>
<td>Skin</td>
<td>T0-1302</td>
<td>Texas Oncology–Dallas</td>
<td>Charles L. Cowey, MD</td>
<td>Multi-site retrospective observational study of US patients with unresectable or metastatic melanoma receiving ipilimumab (Yervoy) as 1st line therapy</td>
</tr>
<tr>
<td>Soft Tissue</td>
<td>11199</td>
<td>Texas Oncology–Dallas</td>
<td>Charles L. Cowey, MD</td>
<td>A randomized controlled study of Yondelis (rabectedin) or dacarbazine for the treatment of advanced liposarcoma or leiomyosarcoma</td>
</tr>
<tr>
<td>Vaccine</td>
<td>013-001</td>
<td>Baylor Dallas</td>
<td>Joseph W. Fay, MD</td>
<td>Mobilization and recovery of CD34+ hematopoietic progenitors from normal volunteers for the in vitro generation of dendritic cells</td>
</tr>
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</table>
Site-Specific Tumor Conferences at Baylor Charles A. Sammons Cancer Centers

At Baylor Sammons Cancer Centers, a key element at the heart of our approach to patient care and education is the site-specific tumor conference program. Rather than focusing solely on recommendations for patient care, the site-specific conferences also aim at educating the medical professionals attending the conference.

Unlike tumor boards, continuing medical education credit is available for physicians who attend. Because several patients with the same diagnosis are presented at each conference, attendees are provided with an in-depth view from specialists, accompanied by lively discussion. Below please find the schedules for tumor conferences across the Baylor Charles A. Sammons Cancer Center network.

Conference Schedules

Baylor Dallas

<table>
<thead>
<tr>
<th>Conference Type</th>
<th>Day(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bone and Soft Tissue</td>
<td>1st Tuesday</td>
</tr>
<tr>
<td>Breast</td>
<td>Thursdays</td>
</tr>
<tr>
<td>Chest</td>
<td>1st, 2nd and 4th Wednesdays</td>
</tr>
<tr>
<td>Endocrine</td>
<td>3rd Tuesday</td>
</tr>
<tr>
<td>GI</td>
<td>Alternating Thursdays</td>
</tr>
<tr>
<td>Gynecology</td>
<td>Wednesdays</td>
</tr>
<tr>
<td>Head and Neck</td>
<td>2nd and 4th Tuesdays</td>
</tr>
<tr>
<td>Head and Neck Journal Club</td>
<td>5th Tuesday</td>
</tr>
<tr>
<td>Hematology/Oncology Journal Club*</td>
<td>Rotating Wednesdays</td>
</tr>
<tr>
<td><strong>Hematology</strong></td>
<td>Rotating Wednesdays</td>
</tr>
<tr>
<td>Liver</td>
<td>2nd and 4th Tuesdays</td>
</tr>
<tr>
<td>Lymphoma*</td>
<td>Rotating Wednesdays</td>
</tr>
<tr>
<td>Neuro-oncology</td>
<td>2nd and 4th Wednesdays</td>
</tr>
<tr>
<td>Pancreas</td>
<td>1st and 3rd Fridays</td>
</tr>
<tr>
<td>Skin</td>
<td>1st and 3rd Wednesdays</td>
</tr>
<tr>
<td>Skull Base</td>
<td>1st Wednesday</td>
</tr>
<tr>
<td>Stem Cell Transplant*</td>
<td>Rotating Wednesdays</td>
</tr>
<tr>
<td>Urology</td>
<td>3rd Wednesday</td>
</tr>
</tbody>
</table>

*Rotate during the month

Baylor Dallas

Most of the site-specific tumor conferences have been relocated to the 10th floor conference center in the new outpatient cancer center. The gynecology and skull base conferences currently remain at their former locations.

For more information about site-specific tumor conferences at Baylor Charles A. Sammons Cancer Center at Dallas, please call 214.820.4073.
Below please find the schedules for tumor conferences across the Baylor Charles A. Sammons Cancer Center network.

**Baylor Fort Worth**

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>Breast</td>
<td>2nd and 4th Wednesdays</td>
</tr>
<tr>
<td>Head and Neck</td>
<td>2nd and 4th Fridays</td>
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<tr>
<td>General</td>
<td>1st, 3rd and 5th Thursdays</td>
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**Baylor Garland**

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>Breast</td>
<td>1st Wednesday</td>
</tr>
<tr>
<td>General</td>
<td>1st and 3rd Wednesdays</td>
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**Baylor Grapevine**

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<thead>
<tr>
<th>Specialty</th>
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<tbody>
<tr>
<td>Breast</td>
<td>4th Wednesday</td>
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<tr>
<td>General</td>
<td>3rd Thursday</td>
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**Baylor Irving**

<table>
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<th>Specialty</th>
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<tbody>
<tr>
<td>Breast</td>
<td>1st and 3rd Tuesdays</td>
</tr>
<tr>
<td>General</td>
<td>1st Tuesday</td>
</tr>
<tr>
<td>Thoracic</td>
<td>1st and 3rd Mondays</td>
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**Baylor Plano**

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Date</th>
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<tbody>
<tr>
<td>General/GI</td>
<td>3rd Thursday</td>
</tr>
<tr>
<td>Breast</td>
<td>1st Thursday</td>
</tr>
<tr>
<td>Lung</td>
<td>2nd Thursday of every EVEN month</td>
</tr>
<tr>
<td>GU</td>
<td>2nd Thursday of every ODD month</td>
</tr>
<tr>
<td>Head and Neck</td>
<td>4th Thursday</td>
</tr>
<tr>
<td>Focus on Research</td>
<td>4th Thursday of the 2nd month of the quarter</td>
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**Baylor Waxahachie**

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<th>Date</th>
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</thead>
<tbody>
<tr>
<td>General</td>
<td>2nd Thursday</td>
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**Baylor Carrollton**

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<tr>
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<tbody>
<tr>
<td>General</td>
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**Baylor McKinney**

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<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>4th Monday</td>
</tr>
</tbody>
</table>

For more information about tumor conferences at any of the other Baylor campuses, please call 214.820.6261.
Recent Publications from Baylor Sammons Cancer Center

February 21, 2013 to June 13, 2013

1. Alvarez RD, Gray HJ, Timmins PF


More than 200 swimmers of all ages and skill levels converged on Saturday, June 8 for fun half-mile, one mile, and two mile swims at the Harbor at Lake Ray Hubbard, and an additional group of about 50 joined in a pool swim at the Town North YMCA. Over the past three years, Swim Across America–Dallas has raised more than $950,000 to benefit the Phase I clinical trials program, bringing to patients with cancer the opportunity to participate in clinical research relating to investigative treatment options. The new 7,000 square foot clinical trials center will now be known as the Swim Across America Innovative Clinical Trials Center at Baylor Charles A. Sammons Cancer Center at Dallas.

SAA is a national non-profit dedicated to fight cancer through swimming. All swims benefit local institutions in the cities where they are held. For more information and to participate next year, go to swimacrossamerica.org/dallas.