Renal cell carcinoma (RCC) has long been a challenge for researchers and clinicians alike, but the prospect of an uphill battle to improve outcomes for patients has not dampened the enthusiasm of faculty at The University of Texas M. D. Anderson Cancer Center. They have instead responded with an all-out assault against the disease: less-invasive treatments for localized tumors, studies of promising adjuvant agents, innovative therapies for patients with metastatic disease, genetic and epigenetic research to find new treatment targets, and data acquisition technology that integrates tissue collection and storage with patient information and data from laboratory studies and clinical trials.

Less-invasive treatments for localized tumors

For small, incidental tumors, the trend of late has been toward procedures that are less invasive and that spare more of the kidney. For the past 15 years or so, partial nephrectomy, in which the tumor and a margin of surrounding tissue are removed but the remainder of the kidney is left intact, has been

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Efforts Under Way to Improve Outcomes for Patients with Renal Cancer

(Continued from page 1)

offered at M. D. Anderson and elsewhere. Partial nephrectomy is used primarily in cases of small peripheral or exophytic tumors; it also can enable patients who have poor renal function or only one kidney to undergo surgery. Surena Matin, M.D., an assistant professor in the Department of Urology, is developing a technique for performing partial nephrectomy laparoscopically in selected patients.

Kamran Ahnarr, M.D., an assistant professor in the Department of Diagnostic Radiology, is examining the role of percutaneous radiofrequency ablation to treat small renal tumors. Researchers are also looking at ways to perform cryoablation percutaneously using magnetic resonance imaging for guidance. Laparoscopic renal cryoablation is already being performed on tumors that are not accessible percutaneously.

For localized tumors that are not amenable to partial nephrectomy, radiofrequency ablation, or cryoablation, laparoscopic radical nephrectomy may still be appropriate. The primary advantage of a laparoscopic procedure over open surgery is a decrease in morbidity, according to Christopher Wood, M.D., an assistant professor in the Department of Urology and one of the busiest renal surgeons in the country.

“Laparoscopic nephrectomy is rapidly becoming the gold standard in the country,” Dr. Wood said, “but it’s not an easy operation to learn, and clearly, experience matters.”

Studies of adjuvant therapies

After years of multi-institutional trials investigating the role of agents such as interferon and interleukin-2 in the adjuvant setting, there is no standard adjuvant therapy for RCC. However, two ongoing clinical trials are investigating promising alternatives.

In one randomized, multicenter trial of patients at high risk for recurrence, heat shock protein peptide complex 96 (HSPPC-96) vaccine, made from each patient's own tumor, is being administered postoperatively. The other trial looks at the role of thalidomide in the adjuvant setting. Both HSPPC-96 and thalidomide have shown activity in metastatic RCC and have acceptable toxicity profiles.

Innovative therapies for metastatic disease

For patients with metastatic renal cancer, the emphasis is on developing novel therapies. Response rates to immunotherapy with interleukin-2 or interferon—the standard of care in metastatic RCC—vary from 5% to 25%; but durable responses are rare, and the median survival duration is only 12 to 16 months.

Laboratory studies suggest that in the case of interferon for RCC, lowering the dose may actually improve response. In a recently closed clinical study, investigators in the Department of Genitourinary Medical Oncology are testing this hypothesis by comparing the efficacy of a continuous, low-dose infusion of interferon with that of the standard intermediate dose in patients with metastatic disease.

Other studies include an assessment of the efficacy of capcitabine combined with gemcitabine in patients with advanced RCC who have been previously treated with immunotherapy and an investigation of the effects of interleukin-2 and thalidomide on bone metastases. Several additional clinical trials are on the horizon, according to Eric Jonasch, M.D., an assistant professor in the Department of Genitourinary Medical Oncology.

Another issue for patients with metastatic disease is the integration of surgery with systemic therapy. One way to ensure that patients who undergo surgery for their metastatic disease are able to receive systemic therapy is to administer the chemotherapy neoadjuvantly.

According to Dr. Jonasch, giving patients chemotherapy before surgery has several advantages. First, it gives the oncologists time to identify patients with rapidly progressing disease who will not benefit from surgery. Second, it allows for an assessment of the chemotherapy regimen. If the type of chemotherapy administered prior to surgery is effective, it is continued postoperatively; if it is not effective, a different agent is used. Last, neoadjuvant therapy enables researchers to collect valuable clinical data by observing patients before and after nephrectomy and by collecting tumor tissue that has been treated with various agents.

“So it ends up being a win-win situation for the patient and the investigator,” Dr. Jonasch said.

Laboratory investigations

In addition to clinical investigations, researchers are conducting animal studies and translational research to identify new targets and treatment agents for RCC.

Cheryl Walker, Ph.D., a professor in the Department of Carcinogenesis at M. D. Anderson’s Science Park Research Division, is studying the only two existing animal models for RCC: a rat model and a mouse model.

“The challenge in developing animal models in renal cell carcinoma is that the major gene, the von Hippel-Lindau (VHL) tumor suppressor gene, in humans is not involved in RCC in rats or mice,” Dr. Walker said.

Instead, defects in the tuberous sclerosis complex-2 (TSC-2) gene are
the major cause of RCC in rats and mice. The TSC gene is also found, infrequently, in humans, where it leads to tuberous sclerosis (benign lesions) and a higher risk for RCC.

Dr. Walker, who has been studying VHL and TSC-2 for the past several years, has found that the two pathways controlled by these genes converge very early on and that the downstream effects of the loss of either gene are the same.

"RCC is a vascular tumor that is very good at recruiting blood vessels," Dr. Walker said. "In humanes, the VHL gene keeps the process in check through suppressing angiogenesis, but loss of the VHL gene sends out VEGF (vascular endothelial growth factor) to recruit blood vessels. The same thing happens in rodent tumors when TSC-2 is lost."

This is an important finding because it means that the efficacy of antiangiogenesis agents in RCC can be studied in animal models before the agents are tested in humans.

Dr. Wood and his colleagues are using genomic hybridization and DNA array analysis to identify other genes that are altered as a consequence of carcinogenesis and progression and to develop therapies to target those genes. Specifically, Dr. Wood is comparing alterations in gene and protein expression in RNA and protein samples from tumor cells and normal cells. So far, several novel molecular pathways have been identified that may be involved in RCC carcinogenesis and progression and serve as targets for therapy.

"Currently, my laboratory is looking at the role of the TGF-β (transforming growth factor-β) signaling pathway in RCC, which was altered in our gene array data, and we’ve identified specific receptors for TGF-β that are deleted during the course of kidney cancer carcinogenesis and progression," Dr. Wood said.

Although VHL is the most common gene linked to the development of RCC in humans, it is probably not sufficient for the generation of metastatic disease, according to Dr. Jonasch. In collaboration with Tim McDonnell, M.D., Ph.D., a professor in the Department of Molecular Pathology, Dr. Jonasch is looking at candidate genes and proteins generated from tissue microarrays of archival specimens from primary and metastatic tumors to determine the similarities and differences in the genetic makeup of the tissues and to begin to understand which genetic abnormalities drive metastasis in kidney cancer.

Along with Amado Zurita-Saavedra, M.D., a postdoctoral fellow in the Department of Genitourinary Medical Oncology, Dr. Jonasch also is investigating the possibility that high levels of circulating stem cells after RCC surgery may enable the spread of metastatic disease in patients with a poor prognosis.

"The stem cells act as sort of Trojan horses to enable circulating tumor cells to set up shop at distant sites. So we want to evaluate levels of circulating stem cells, endothelial precursor cells, and tumor cells to see whether or not there is a relationship between the levels and ratio of these cells and the prevalence of metastatic disease," Dr. Jonasch said.

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**PROTOCOLS**

**Studies Examine Treatments for Renal Cell Carcinoma**

Clinical trials in progress at The University of Texas M.D. Anderson Cancer Center include the following for patients with renal cell carcinoma.

- Bone-targeted therapy consisting of zoledronate, thalidomide, and interferon-γ in renal cell carcinoma: a phase II study (ID01-570). **Physician:** Shi-Ming Tu, M.D.

- A randomized phase II trial studying adjuvant thalidomide for patients at high risk of disease recurrence following surgery for renal cell carcinoma (ID01-205). **Physician:** Christopher G. Wood, M.D.

- Study of the efficacy of minilageneic peripheral blood progenitor cell transplantation for metastatic renal cell carcinoma (DMP99-007). **Physician:** Naoto T. Ueno, M.D., Ph.D.

- A multicenter randomized phase III study of adjuvant oncophage versus observation in patients at high risk of recurrence after surgical treatment for renal cell carcinoma (ID01-082). **Physician:** Christopher G. Wood, M.D.

- A phase II trial of capetibinme plus gemcitabine in patients with advanced renal cell cancer previously treated with immunotherapy (ID02-265). **Physician:** Nizar Tannir, M.D.

- A phase II study of the route and dose of heat shock protein peptide complex 96 (HSPC-96) vaccine in patients with metastatic renal cell carcinoma (ID02-466). **Physician:** Christopher G. Wood, M.D.

- Quality of life of patients undergoing renal surgery for renal cell carcinoma (URL01-023). **Physician:** Louis Pisters, M.D.

**FOR MORE INFORMATION** about these clinical trials, physicians or patients may call the M. D. Anderson Information Line. Those within the United States should call (800) 392-1611; those in Houston or outside the United States should call (713) 792-3245. Visit the M. D. Anderson Cancer Center clinical trials Web site at http://www.clinicaltrials.org for a broader listing of treatment research protocols.
Art Therapy Helps Children

by Karen Stuyck

Simple lines, bright colors, and primitive shapes give the artwork a decidedly childlike quality, but the scenes the young artists portray are disturbing—a floating house, a person jumping from a burning airplane, a sinister bee that drinks blood.

The art that these young patients and children of patients create is "a window into the less-conscious mind," said Estela A. Beale, M.D., a child and adult psychiatrist and associate professor in the Department of Neuro-Oncology at The University of Texas M. D. Anderson Cancer Center.

The premise behind art therapy—using a young patient's art for a psychotherapeutic purpose—is that creating pictures allows children to express what is uppermost in their minds more genuinely and spontaneously than they are apt to do in a discussion with the therapist. "What is really important is to let the children express themselves without any influence from an adult," Dr. Beale said.

Pictures help the therapist understand the children's perceptions and feelings about what is happening to them and explore possible alternatives to solving problems, Dr. Beale said.

Sometimes the child's art expresses this information quite graphically, but often the young artist's thoughts and feelings are "concealed, disguised, or expressed metaphorically," Dr. Beale said.

The children's art often expresses concepts they aren't able to articulate. When asked what he thinks about his illness, a young child may not be able to answer, but he can depict how he perceives his situation in a painting or drawing. One eight-year-old patient, for instance, drew a picture of someone parachuting from an airplane over water that is full of triangles.

"Oh, why is he jumping?" Dr. Beale asked.

"He's jumping because the plane is on fire and about to explode," the child told her. Beneath the man is an island surrounded by sharks—the triangles. There is also a boat in the water, but it is empty, and the child feared it might be dangerous to go there.

"Because of his illness, this child sees his life as threatened, and there is nowhere to turn for solace, encouragement, or hope," said Dr. Beale.

This is where the therapy begins. "In the therapeutic process, you have expression of feelings and an opportunity to review the understanding of the illness, which is a cognitive process," she said. Another very important part of therapy is to help young patients find alternatives to deal with what they feel is ominous or dangerous—to offer them hope.

Some children are able to talk about the feelings that inspired their artwork, but others become even more frightened once they put their fears into the pictures. Dr. Beale said. To counteract this, she often keeps the discussion in the picture's metaphor. The children then, in their own time, work on the new ideas and concepts she presents to them, until they feel more comfortable with their condition and with the questions and fears that they experience, she said.

To the child who drew the burning plane and circling sharks, for example, Dr. Beale would not say, "Oh, the plane is not going to burn down, and you don't have to worry. We're going to erase the fire," because that would not address the child's terror. The plane, which is burning or disintegrating, clearly has something to do with the child's body, Dr. Beale said, and he wants to get away from it.

Instead, she would help the child to construct alternative solutions, such as finding safety for the man with the parachute.

"Sometimes in life we feel that we are surrounded with danger," she might
Affected by Cancer Express Their Emotions

Art therapy allows children to express their concerns more genuinely and spontaneously than they may be able to in a discussion with a therapist. Dr. Estela A. Beale, a child and adult psychiatrist and associate professor in the Department of Neuro-Oncology, holds up a picture of a bee drawn by a seven-year-old child with leukemia.

tell the child. “I imagine you feel that way when you are hurting and have to come back for chemotherapy and don’t know if you are going to be able to get out of this.”

At this point, some children are willing to open up about their concerns, but other children affected by cancer are too discouraged or frightened to respond. In such instances, Dr. Beale tries to offer hope in some other area of their lives. For a child without medical problems, the therapy would probably emphasize exploring his or her internal world, she said, but in a child with cancer, the therapy must help the child deal with the illness and the fears it creates by offering an alternative to isolation as well as specific solutions that can preserve the best possible quality of life.

“You are very frightened. What would help you?” Dr. Beale might ask the child. They could then discuss, among other solutions, how the child’s parents could help.

The way children respond to a discussion of their illness is determined by how their parents talk to them about cancer. Parents who are very open about sharing information have children who are very open about their illness, their perceptions, and their fears, Dr. Beale said. “But if the parent is too overwhelmed to permit discussion, the likelihood is that the child will be very timid about discussing their disease and will avoid bringing things up, except to express them metaphorically.”

Another eight-year-old patient drew a picture for Dr. Beale of a house that seemed to be floating off the ground. Even though her parents had told her little, the child knew she was very ill, but she had no clear information about what was happening to her body. “She was up in the air,” Dr. Beale said.

Usually, the houses in children’s drawings represent the body, which contains life, Dr. Beale said. This girl’s picture showed a primitive-looking house that was empty.

“This house is not on the ground, is it?” Dr. Beale asked her.

“No, this house is floating. It’s very light, and the people in the house like to float,” the child responded.

“But you know, this is a house that looks sad,” Dr. Beale observed.

“Yes, because all the neighbors are in another city.”

“That must be so lonesome, and I’m sure you know about that.”

The girl saw the connection and later started talking about how lonely she was, even when her mother was present. She also came to understand what was happening to her, which helped to allay her anxiety and reassure her.

Parents who do not discuss cancer with their children assume the child does not know what is happening. Usually, they are wrong, Dr. Beale said. One three-and-a-half-year-old child who was not told about her mother’s cancer drew a picture of her with hair—even though the woman was bald from chemotherapy—and insisted that she preferred “mother with hair and no cancer!” According to Dr. Beale, the child knew her mother was sick and was expressing a desire for her to be well.

Parents often think that they are protecting their children by refusing to discuss the child’s illness and telling them, “Don’t worry. Everything is going to be okay.” But in reality, when children aren’t allowed to express their concerns, they can feel isolated and more fearful, Dr. Beale said. The child’s resulting despair is as much about the lack of human connection as it is about the illness.

In contrast, a seven-year-old child with leukemia whose mother had discussed her illness with her drew a picture of a monster bee that killed people and “likes to eat blood.”

“He wants to be invisible,” the child told Dr. Beale, “but he can’t.” The cancer, Dr. Beale explained, was a clear enemy.

“If parents can just listen and not be judgmental or prematurely reassuring, they can metabolize the feelings and return them to the child in a more acceptable way,” she said.

This is part of what Dr. Beale does in therapy with the children. “Catharsis alone is not enough,” she said. The children have to be able to express their fears in the context of an accepting relationship. This helps to contain some of the anxieties they are experiencing, which can lead to reframing or expressing things in a different way. “When children find some answers to their fears in the context of a trusting relationship, hope improves—even if their illness does not,” Dr. Beale said.

FOR MORE INFORMATION, contact Dr. Beale at (713) 792-7546.
Children's Art Project Has Been Improving the Lives of Children with Cancer for 30 Years

by Karen Stuyck

and receiving treatment for osteosarcoma at The University of Texas M. D. Anderson Cancer Center, where he also goes to school. His picture "Stick Flowers" appears both on a notecard and in a children's book, Our Seasons, produced by M. D. Anderson's Children's Art Project.

who also attends M. D. Anderson's in-hospital classroom while receiving treatment. has two designs this year in the annual holiday card collection: a praying angel and a shepherd and lamb. In addition, his watermelon art appears in the Children's Art Project's Alphabet Garden book, and his picture of an apple heart is on notecards, a notecube, a list pad, and magnets.

These young artists are part of a long line of patients who have contributed to, and benefited from, the Children's Art Project. In 1973, an Anderson Network volunteer remarked that a young patient's artwork was "pretty enough to be a Christmas card," and the rest, as they say, is history. At first, the project focused only on holiday cards, but now it produces a variety of gifts and cards featuring original art from young patients.

Over the past 30 years, the Children's Art Project has raised more than $17 million for patient-focused programs at M. D. Anderson.

This year, profits from the sale of the project's products will fund $1.5 million of programs: summer camps for young patients and their siblings, a ski trip for amputees, teachers' salaries and other expenses for the in-hospital classroom, and college and graduate scholarships that so far have helped more than 400 patients earn college degrees.

"The purpose of the Children's Art Project is to make life better for children with cancer by funding programs that benefit the patients' educational, emotional, and recreational needs," said Shannan A. Murray, executive director of the project. To that end, the project funds music and art therapy, vocational training for young adults, and the salaries of six child-life specialists who provide therapeutic play activities and emotional support to young patients.

Artists have been as young as two years old and as old as 18, Murray said. This year, 44 different designs by children will be featured on various products, which now include children's books, calendars, cards for all seasons, journals and address books, Christmas tree ornaments, T-shirts, jewelry, neckties, and scarves.

Children create most of the art during weekly art classes at the hospital. If a child is too sick to come to class, the art teacher will go to the child's bedside, Murray said. Brothers and sisters of patients also may attend the class because "we know cancer affects the whole family, and siblings are affected along with the patients," she said.

The Children's Art Project staff never suggests specific subjects for the young artists to draw; instead, they comb through hundreds of designs made by the children. If a child's drawing is not picked one year, it could still be used later on.

The artists whose designs are used on a card or gift receive honorariums as well as samples of all the products containing their artwork. Most important, they receive the knowledge that they have helped their fellow patients, and themselves, through a difficult time.

For more information, contact Shannan Murray at (713) 745-2575.
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When a Parent Is Sick: Talking to Children about Cancer

Because they believe that one of their most important responsibilities is to protect their children—physically and emotionally—from harm, parents who have been diagnosed with cancer may choose not to tell their children about their illness. It is important, however, for parents to talk about the cancer. If they don’t, children are likely to sense that something is wrong and become worried and isolated. It is equally important to give children a chance to express the emotions they feel and to reassure them.

The key to good communication is tailoring it to the age and developmental stage of each child. A three-year-old, for example, would only need to know that mommy has something called cancer that makes her feel sick sometimes and that she is going to see the doctors to try to make it all better. If the parent is going to experience obvious side effects from the treatment (e.g., hair loss, fatigue), preparing children for this ahead of time will lessen their anxiety. With school-age children, parents can be more frank about what the treatment entails and how it will affect the family’s day-to-day routine. Parents will never go wrong if they listen closely to the questions that children ask and give genuine, honest answers.

As treatment begins, it will be important for the parents to keep the children updated on what is happening. They may arrange a family conference once a month to discuss how things are going, what the latest tests showed, and how the treatment is working. These are particularly good for families with school-age or teenage children. We recommend that children be included in some visits to the hospital so that they feel a part of the family member’s care and so that they can visualize where their loved one is and who is taking care of him or her. Children should be prepared for what they will see and hear in the hospital and encouraged to contribute support in their own way, whether it be drawing a picture, helping the nurse take vital signs, or just sharing laughter and hugs.

It is best not to promise children that their parent isn’t going to die (we all will, someday). Rather, say that the doctors are going to give some very strong medicine to battle the cancer, and they hope that it will be successful. In most hospitals, professionals such as social workers, child-life specialists, or psychologists will help parents talk to their children about their prognosis.

Children benefit greatly from the opportunity to stay emotionally connected to a parent who is undergoing cancer treatment. Therefore, both family members and the patient’s treatment team should not hesitate to include them in the experience.