Stereotactic Body Radiation Therapy (SBRT)
What is Stereotactic Body Radiation Therapy (SBRT)?
SBRT is a form of radiation therapy in which a high dose of radiation is delivered to a highly focused area. Using multiple radiation beam angles, radiation oncologists are able to target the tumor only and spare healthy tissue.

How different is SBRT from conventional radiation therapy?
With conventional radiation therapy, radiation is delivered in relatively small doses in daily treatments over the course of several weeks. With SBRT, radiation oncologists are able to deliver a higher dose of radiation over the course of far fewer treatments, typically one to five, over one to two weeks. SBRT has shown significantly better outcomes than conventional radiation therapy. Although SBRT delivers higher biological dosage of radiation, patients have experienced significantly fewer side effects.

Who can benefit from SBRT?
Candidates for SBRT are patients with early stage lung cancer with tumors typically less than or equal to 5 cm (2 inches) who are not good candidates for surgery or who decline surgery. Patients with lung and liver metastases from other primary cancers such as colon cancer or breast cancer are also potential candidates for SBRT. Patients with spinal bone metastases from radio-resistant cancers such as kidney cancer and melanoma are potential candidates as well.
Why should you have SBRT treatments at Carle?
Carle Radiation Oncology offers the most advanced radiation treatments to patients with cancer. Staff has the clinical and technical expertise to implement this very accurate radiation therapy and works with patients to develop a treatment plan, assess response and manage any side effects. Radiation oncologists work closely with a team of diagnostic radiologists, interventional radiologists, surgical oncologists and medical oncologists to design the best treatment for each individual. Carle has a state-of-the-art, image-guided linear accelerator, called the Varian Trilogy™, which provides accurate and very concentrated doses of radiation. The Varian Trilogy™ accelerator also shapes the radiation beam, mirroring the tumor's size and shape and delivering a very precise dose right where it is needed.

What should you expect prior to and during SBRT treatment sessions?

Mapping
For the most precise delivery of radiation, you will come to a mapping appointment prior to treatment. For this session, you will lie in a special immobilization frame with your arms above your head. If you are going to receive SBRT for early stage lung cancer or liver metastasis, the radiation oncologist and radiation therapists will also place a compression plate on your belly and perform fluoroscopy (an imaging procedure) to assess the organ and tissue motion. Then, you will go to a CT simulation room for a four-dimensional scan that maps the target area while it moves with the breathing cycle. This CT simulation appointment takes about 90 minutes. After you go home, staff will develop a radiation plan that ensures delivery of full radiation dose to the tumor and safe exposure to normal tissue structures (organs not affected by cancer). The planning process takes several days.

Verification
When the treatment plan is ready, prior to the actual treatment, our office will contact you to arrange an appointment for treatment verification. This is a procedure in which a team of therapists and dosimetrists will check the angles of the beams while you are in the treatment position with your arms up and compression plate on your belly. Verification takes about 30-45 minutes and is usually required when the lung and liver tumors are treated but not for spinal tumors.
Treatment
On the days of treatment, you will be positioned carefully on one of our treatment units. With a radiation oncologist, our experienced radiation therapists will perform check-ups to make sure you are properly positioned. A compression plate will again be placed on your belly to minimize the motion of your lungs and diaphragm. Ideally, your stomach should be empty at the time of your treatment to minimize a potential discomfort from the compression. The treatment team will use a scan known as cone-beam CT to align the SBRT treatment according to the original treatment plan. The treatment procedure, including alignment and imaging, takes 30 minutes to one hour.

Follow-up
Your first follow-up appointment will be about four weeks after you complete SBRT. The radiation oncologist will talk to you about follow-up imaging to assess the response to treatment. Tumors do not shrink immediately after treatment, and it takes several weeks to see the results.

How to prepare for SBRT treatment
• Please arrive 15 minutes before your scheduled time for mapping and treatment sessions. Note that CT simulation is an appointment for radiation therapy planning/mapping only. You will have one to five treatment sessions for SBRT.
• Please have a very light meal before the mapping session and each treatment with SBRT. This will make you feel more comfortable during treatment.
• If you have a dry cough or back pain, please let your radiation oncologist know. Your radiation oncologist may decide to prescribe you some medications, which you can take before the sessions.
• If you have a condition called abdominal aortic aneurysm, a ballooning of the abdominal aorta, please inform your radiation oncologist before the mapping session.