

Chin-on-Chest Cervical Spine Deformity Surgery and Recovery

The main objective of surgery to correct cervical kyphosis is to achieve a straight-ahead gaze for patients. While this goal might sound simple and straightforward, the surgery and recovery are anything but.

Lee Riley, III, executive vice chairman in the Johns Hopkins Department of Orthopaedic Surgery, specializes in cervical spine revisions and deformities such as spondylosis, degenerative disc disease and severe hyperkyphoses such as chin-on-chest deformities. He says the procedures to correct chin-on-chest deformities often take 10 to 12 hours and involve a posterior approach to the neck, followed by an anterior approach, and then another posterior approach.

“It’s basically three operations under the same anesthetic,” says Riley. “Part of the challenge is determining how to execute the surgery from a technical and sequencing standpoint and understanding what you can accomplish in one sitting. You have to consider the merits of staging, and you need to anticipate complications both during and after the operation.”

To correct cervical kyphosis, Riley first uses a posterior approach to loosen the joints in the back of the neck, decompressing the nerves. He then inserts screws as fixation points. In an anterior stage, Riley makes a small incision, advances past

the esophagus, trachea and blood vessels, and removes discs or part of the bone, which allows him to mobilize the patient’s neck. He then adds structural bone, which he says acts “kind of like a doorjamb that allows the bone to heal together but also provides structural support.” In the final posterior stage, Riley repositions the neck using screws, rods and bone graft.

“The difficulty,” Riley says, “is that all of this manipulation must be performed within the constraints of how much manipulation the nerves and spinal cord can tolerate. You have to maximize the space for the nerves and the spinal cord to move in order to avoid paralysis or damage to the spinal cord.”

For patients, the six- to 12-month long recovery process can be very difficult. “Helping patients understand preoperatively what they are committing themselves to and then making a commitment to them that you will get them through the operation is really important,” says Riley.

Postoperatively, Riley monitors for instrumentation failure, infection and nerve injury. Because the patient will likely require a gastric feeding tube for a period of time after surgery, swallowing and speech therapists are involved during the early postoperative period. These therapists can help advise patients on steps they can take to avoid complications such as aspiration and pneumonia.

“We have tremendous resources available here at Hopkins—cutting-edge equipment, operating rooms, intensive care units, as well as skilled intensivists,” says Riley. “Everyone is committed to expert, patient-centered care.” ■



Lee Riley, III

POSTOPERATIVE PERIOD



Recovery takes six to 12 months



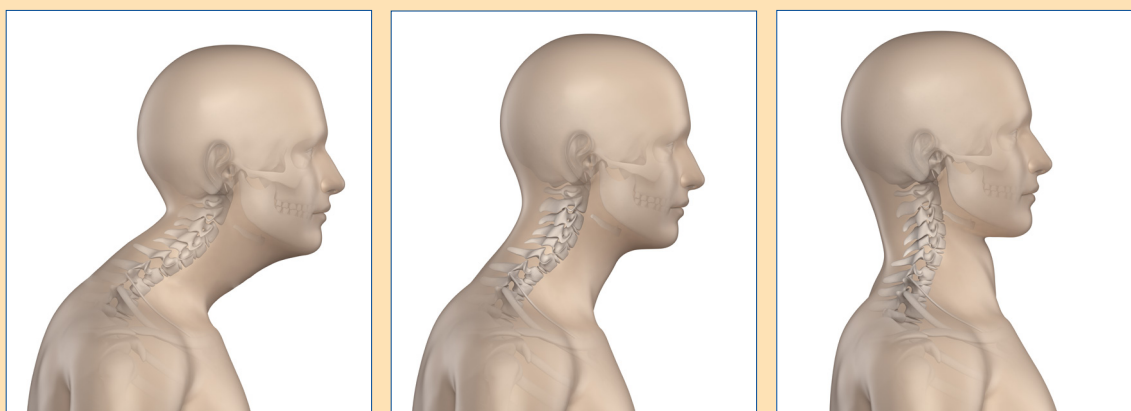
Patients are monitored closely for instrumentation failure, infection and nerve injury



Swallowing and speech therapists are involved in early postoperative period

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– Lee Riley, III, orthopaedic surgeon



To correct cervical kyphosis, Lee Riley, III, uses a posterior approach to loosen the joints in the back of the neck. He then inserts screws as fixation points. In an anterior stage, he makes a small incision, advances past the esophagus, trachea and blood vessels, and removes discs or part of the bone, which allows him to mobilize the patient’s neck. He then adds structural bone. In the final posterior stage, Riley repositions the neck using screws, rods and bone graft.

From Appalachian Roots to a Funding Legacy: The Heatherly Sisters

When a man snatched her purse in Washington, D.C., Anna Heatherly, then just a teenager, tackled him, retrieved her purse and, for good measure, scolded him as he ran away. Heatherly went on to become the first woman to graduate from the University of Virginia with a doctorate, in 1970. Her strong nature, generosity and dedication to what is right served her well, and eventually served researchers in the Johns Hopkins Department of Orthopaedic Surgery.

Her older sister, Julia, was similarly independent, having served in the U.S. Army for two years and as a registered nurse working with psychiatric patients at Walter Reed General Hospital. With her colleagues, Julia established a methadone clinic in Alexandria, Virginia, reflecting her dedication to those in need.

The sisters came from a working class family in the Appalachian region of eastern Tennessee. Their devotion to each other, to their mother and to the values they were taught—namely, to give back—were defining attributes. They were proud of their modest roots but determined to leave a legacy.

When they needed health care, both sisters came to Johns Hopkins. They appreciated the sophisticated care they received from Edward McFarland, M.D., director of the Division of Shoulder Surgery, and Lee Riley, M.D., spine surgeon and vice director of clinical operations. McFarland recalls, “They made a terrific pair. Office visits were wonderful, with their quick



wit and intelligent discussions.” The admiration was mutual.

Julia, who dedicated herself to serving others through health care, and Anna, who became a leader in the field of reading education, recognized the difference that expert orthopaedic care made in their lives and wanted to give other patients access to the same.

To honor their doctors, the sisters made a bequest in the form of the Anna and Julia Heatherly Fund, which supports the work of Edward McFarland and Lee Riley. “Funding for clinical musculoskeletal research is limited, and most of my research is funded through philanthropy,” McFarland says. “The support of donors has made all the difference in what we can accomplish.”

The Heatherly sisters were not only generous. They were also self-taught investors and businesswomen. Through a life of careful consumption and dedicated saving, they were able to leave a legacy—an endowed fund that provides a steady stream of research support to a cause they believed in. Thanks to their donation, McFarland says, “We have been able to improve the health of people around the world through biomedical research.”

There are many ways to support the Johns Hopkins Department of Orthopaedic Surgery. A gift through

a will or trust, or by beneficiary designation like the Heatherly sisters’ gift, supports our future and allows you to remain in control of your assets during your lifetime. For information about leaving your own legacy or how to support the physicians’ work, please contact Donna Clare in the development office at 410-955-6936 or dclare2@jhmi.edu. ■

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DIGITAL HEALTH

Aiming to Predict Recovery and Tailor Support for Spine Surgery Patients

A Johns Hopkins team is using innovative methods to predict how patients will fare after surgery for spine degeneration and to tailor support for these patients during their recovery. **Richard Skolasky**, director of the Spine Outcomes Research Center at the Johns Hopkins University School of Medicine, aims to enable surgeons to predict, at three months postoperatively, how patients’ recovery trajectories may evolve throughout the first year. This information may then help surgeons tailor support for these patients.

To do this, Skolasky and his team first determined which aspects of recovery were most important to patients. They convened focus groups of spine patients and asked them about their health-related goals, which the researchers then mapped onto the validated PROMIS (Patient-Reported Outcomes Measurement Information System) health domains. They then used the data from PROMIS health assessments to develop a risk calculator to help



Richard Skolasky is developing a mobile app to track the recovery of spine patients by collecting real-life data.

Orthopaedic Oncology for Patients with Upper Extremity Tumors of the Hand

A Johns Hopkins orthopaedic surgeon is filling the gap in care for patients with upper extremity tumors of the hand. **Sophia Strike** specializes in hand oncology and works with a team of experts to provide multidisciplinary care for orthopaedic oncology. New technological developments, advancements in chemotherapy and radiation, and specialized training all empower Strike to offer numerous surgical options.

Now, says Strike, referring physicians don't have to pick one specialty over another. "Should I send my patient to a hand surgeon? Should I send them to an oncologist?" You can have both in one.

After diagnosing a patient, Strike makes recommendations from a multitude of treatment options. "Every patient is just different enough from the last one that it is always a challenge to determine the best plan of care for them."

New technological developments, such as thinner sutures, and specialized training in "supermicrosurgery" have provided more surgical options, as well. Strike explains that advancements in microsurgery now allow submillimeter vessels to be repaired and to preserve more of the hand. For example, she says, "If I remove a small tumor around a blood vessel, we can reconstruct the blood vessel. The technique has become more and more precise so



Sophia Strike specializes in hand oncology and works with a team of experts to provide multidisciplinary care for orthopaedic oncology.

we can reconstruct smaller vessels than in the past, when we probably would have had to amputate."

In addition, she says advancements in chemotherapy and radiation have allowed her to save more structures. "Depending on the type of cancer, tumors can be radiated or patients can undergo systemic therapy to help us preserve more of the hand," says Strike.

Although most upper extremity tumors are

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– Sophia Strike, orthopaedic surgeon

benign, including an enchondroma or giant cell tumor of tendon sheath, some malignant tumors can occur in the hand. These include soft-tissue sarcoma, chondrosarcoma, osteosarcoma or Ewing sarcoma. Strike says epithelioid and synovial sarcomas are the most common soft-tissue sarcomas in the adult hand, but squamous cell carcinoma is one of the most common malignant conditions found on the hand.

Diagnosis and treatment can be difficult because every case is unique. "The same thing that makes me excited about what I do is also what makes it challenging. You are not following a clear pathway where you just check a box and go in a set direction," says Strike.

Since discovering a passion for oncology during her residency at Johns Hopkins, Strike spent six months focusing on oncology during a hand fellowship with the National University of Singapore School of Medicine. "Because I was able to focus on this almost exclusively, I learned so much," she says. "It's extremely rewarding to apply this knowledge to help patients." ■

predict a patient's symptoms and functional limitations one year after surgery. These projections can guide physicians in setting realistic expectations with patients for what they will achieve in their recovery.

With support from the orthopaedic spine division, and in collaboration with the Johns Hopkins Department of Physical Medicine and Rehabilitation, Skolasky's group is beginning another aspect of this research—to develop a mobile application to track the recovery of spine patients by collecting real-life data.

"The six to 12 weeks after surgery is such an important time for patients to resume their activities, like getting up and starting to walk, and for clinicians to ensure that infection doesn't develop," Skolasky says. "These 'real-life' measurements can be very valuable during this time."

Skolasky says the application will enable two-way communication during those 12 weeks by prompting patients to do physical therapy exercises and sending

clinicians real-time updates on pain and mood levels. "They like receiving reminders via phone, as opposed to paper instructions, which can get lost," he says.

Additionally, the application will create individualized "rules" for each patient, so if their recovery deviates from what is expected, the application will alert the provider. For example, if a patient reports more limited mobility than expected, the information will be relayed to the clinician, who can address this issue in a follow-up appointment.

Another potential benefit is the immediacy of the mobile platform, which may increase reporting accuracy. "When the app asks about a patient's pain, the patient reports how their pain is affecting their life, in their natural environment, versus reporting pain in a clinical setting after having traveled to their appointment," Skolasky says.

The risk calculator is currently in the validation stages, and Skolasky and his team hope to begin development of the app in late 2019. ■





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Framework

This newsletter is one of the many ways we seek to enhance our partnership with our thousands of friends and patients. Comments, questions and topics you would like to see covered in upcoming issues are always welcome.

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Inside



1

**Chin-on-Chest
Cervical Spine
Deformity
Surgery and
Recovery**



2

**From Appalachian
Roots to a
Funding Legacy:
The Heatherly
Sisters**



3

**Orthopaedic
Oncology for
Patients with
Upper Extremity
Tumors of the
Hand**