Sara Gutknecht, D.N.P., is a certified nurse practitioner specializing in pediatric orthopaedics. Gutknecht sees children with a variety of orthopaedic conditions, including scoliosis and other spine conditions. She has worked at Gillette Children’s Specialty Healthcare for 16 years and has a master’s degree in nursing and a doctorate in nursing practice.

Gutknecht received a bachelor of science degree in nursing, a master of science degree in rehabilitation nursing, and a doctorate in nursing practice.


Lonstein’s appointments include staff surgeon throughout the pickup service at Gillette Children’s Specialty Healthcare for patients 16 or older. Sedation is available at both sites. Physicians performing the studies include:

- Supreet Deshpande, M.D., pediatric rehabilitation medicine specialist
- Peter Kashubska, M.D., pediatric neuroradiologist/neurologist
- Suren Deshpande, M.D., pediatric rehabilitation medicine specialist

To refer a patient, please contact Patient Appointment Services at 651-290-873 or 985-719-943. An office visit with the evaluating provider may be required for patients with unclear symptom or uncertain diagnosis.

Moving Forward in the Treatment of Pediatric Neurological Disorders
A Biennial Conference Honoring James R. Gage, M.D.

The Minneapolis Convention Center, Minneapolis, Minn.

The course is intended to increase providers’ understanding of advances in research, diagnosis, and treatment for pediatric neurological disorders. The conference will focus on recent developments in neurological function, and ethical issues related to pediatric neurosciences.

For more information on the abstract submission and conference process, visit the Gillette Web site at www.gillettechildrens.org/neurosciences2010 or contact Paul Timari at 651-290-1174.

Gillote expands EMG availability

Gillette is proud to announce a rapidly expanding capability of electromyography (EMG) as an inpatient and outpatient testing procedure. We now offer eight clinics each month at the main campus. The EMG clinics are able to accommodate patients of all ages because we have an experienced team and advanced equipment.

EMG is used to test the function of muscle and nerve and can help diagnose various conditions, such as muscle weakness, chronic pain, and conditions affecting movement. 

Referral Information

For all Gillette specialty care services, please call 651-229-3800 or 1-888-GILLETTE.

Center for Gait and Motion Analysis 651-229-3868
Center for Pediatric Rheumatology 651-229-3803
Center for Sports Medicine 651-229-3879
Gait Lab 651-229-3800

To learn more about Gillette, visit www.gillettechildrens.org.
Evaluation Tools

Primary Care Evaluation

When a child is found to have idiopathic scoliosis, it is important to obtain a comprehensive family history. Developmental status is also important. For example, determine whether anemia has occurred, and if so, when. Include the Adams Forward Bending Test to evaluate for spinal asymmetry and sexual maturity. If there are signs of scoliosis, obtain a complete spinal and neurologic examination. Radiographs provide objective measures of spine alignment and skeletal growth.

Refer to an orthopaedic specialist if the curve is greater than 20 degrees and if the patient has growth potential remaining. Also refer patients with curves greater than 40 degrees, as well as those with rapid progression or failure to respond to bracing.

In addition, Gillette is taking part in a multicenter study evaluating outcomes in idiopathic scoliosis. The National Institutes of Health/National Institute of Arthritis and Musculoskeletal and Skin Diseases is funding this research and is expected to enroll 180 subjects. Lessons learned from this study will help to improve decision-making and treatment of scoliosis patients and families.

Case Study

A healthy 12-year-old girl had a positive scoliosis screening for her. She told her primary care provider she had a mild spinal asymmetry on examination.

The girl returned to the provider’s clinic a year later. She had not returned back to the office with significant signs or symptoms, but the girl did not interfere with her ability to participate in her normal activities. She did not have any pain, numbness, or tingling. So, she was discharged.

The patient had met normal developmental milestones. Her past medical history and family history were not significant. She was a normal, healthy 12-year-old girl.

The patient had not returned back to the office with significant signs or symptoms. She did not have any pain, numbness, or tingling. So, she was discharged.
School screeners are instructed to use the scoliometer in the following fashion. The student should:

- Stand with feet shoulder-width apart, back straight, with arms straight down at their sides (perpendicular to the ground) and head down. (See Photo 2, Page 3). If the student is in a wheelchair, the examiner should talk to the child and explain the process to the child.

Primarycare providers should continue to evaluate patients for scoliosis at every well-child checkup and during physical exams for adolescents. (See Primary Care Evaluation, Right.)

Evalluation Tools
Formally, scoliosis screening recommendations include two methods of evaluation: physical examination, including the Adams Forward Bending Test, and objective measurement of the angle of trunk rotation (ATR) with a scoliometer (see Photo 4, right). Because of inconstancy in physical examination techniques, and in the effort to decrease cost, both during screening results, the Minnesota recommends including a physical examination in scoliosis screening. Using a scoliometer is the only method recommended for Minnesota school screening.

School screeners are instructed to use the scoliometer in the following manner:

- Stand in the Adams Forward Bending position.
- While seated 3 to 5 inches back from the examiner, look for scoliotic curves, such as:
  - An asymmetric curve or a scoliotic pileup.
  - Shoulder/spinal symmetry
  - Uneven waist
  - Oblique pupils
  - Unequal distance between the areas and sides of the body when standing upright or in the Adams Forward Bending Test position.
  - Tinkle rotation with the Adams Forward Bending Test
  - Evaluation done for possible signs of underlying spinal dysraphism, such as a lumbosacral, hairy patches, and spinal stenosis.

Screening
Primarycare providers should also evaluate children’s history and physical examination for additional signs of idiopathic scoliosis. Idiopathic scoliosis tends to run in families, so it is important to obtain a comprehensive family history. Developmental status is also important. For example, determine whether insurance has occurred, and if so, when. Include the Adams Forward Bending Test to evaluate for spinal asymmetry and sexual maturity. If there are signs of scoliosis, obtain a standing posterior-anterior spinal radiograph. Radiographs provides objective measures of spine alignment and skeletal maturity.

Primary Care Evaluation
Because not all children undergo scoliosis screening, most of the responsibility for early identification and treatment of scoliosis falls on primary care providers. Primary care providers should evaluate children with symptoms of a possible scoliotic condition:

- Shoulder/scapular asymmetry
- Uneven waist
- Oblique pupils
- Unequal distances between the areas and sides of the body when standing upright or in the Adams Forward Bending Test position.
- Tinkle rotation with the Adams Forward Bending Test
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- Shoulder/scapular asymmetry
- Uneven waist
- Oblique pupils
- Unequal distances between the areas and sides of the body when standing upright or in the Adams Forward Bending Test position.
- Tinkle rotation with the Adams Forward Bending Test
- Evaluation done for possible signs of underlying spinal dysraphism, such as a lumbosacral, hairy patches, and spinal stenosis.
• Stand in the Adams Forward Bending Test position.

Screeners are instructed to use the scoliometer in the following ways to decrease false-positive screening results, the MDH no longer recommends screening girls in fall of fifth grade or ninth grade. Although overall prevalence of scoliosis is fairly similar in the general population, girls are more likely to develop a curve.

Methods of Evaluation

Evaluation Tools

Primary Care Evaluation

Primary care providers should continue to evaluate patients for scoliosis at every well-child checkup and during physical examinations for adolescents. If the screening is abnormal, a more thorough evaluation is indicated.

Previous recommendations favored school screening for boys in fifth and sixth grade. All studies report a decrease in false-positive screening results when boys are screened in the spring of sixth grade or ninth grade. The pediatric spine surgeon’s office should continue to evaluate and treat patients with idiopathic scoliosis.

Look for clues to scoliosis, such as:
• Unequal distances between the arms and sides of the body
• Oblique pelvis
• Uneven waistline

Referral

At 6 degrees ATR* or greater
Not recommended for boys
Girls in fall of fifth grade and spring of sixth grade
Boys in eighth or ninth grade
At 7 degrees ATR* or greater, referral for board-certified pediatric orthopaedic specialist
Girls in fifth and eighth grades
Boys in eighth or ninth grade

2003 Recommendations

2008 Recommendations

Scoliometer, used according to instructions

tensioning of musculature of the spine.

5.0 is considered high risk for curve progression. At-risk patients are referred for spine films to assess curve morphology and progression.

Scoliosis: A Life-threatening Disease

Scoliosis is a spinal deformity that involves abnormal curvature of the spine. Scoliosis is found in about 3% of the general population and affects both children and adults. The current understanding of idiopathic scoliosis is that it is a result of an abnormal development of the vertebrae during early embryonic life. The exact cause of idiopathic scoliosis is not fully understood, but it is thought to involve a combination of genetic and environmental factors. The risk of developing idiopathic scoliosis increases with age and is higher in girls than in boys.

Idiopathic scoliosis tends to run in families, so it is important to obtain a comprehensive family history. Developmental status is also important. For example, determine whether an infant has occurred, and if so, when. Include the Adams Forward Bending Test to evaluate for spinal asymmetry and sexual maturity. If there are signs of scoliosis, obtain an oblique cervical and anteroposterior spinal radiograph. Radiographs provide objective measures of spine alignment and skeletal development.

Refer to an orthopaedic specialist if the curve is greater than 20 degrees and if the patient has growth potential remaining. Also refer patients with curves greater than 40 degrees to a pediatric orthopaedic surgeon for further evaluation and treatment.

Skeletal maturity was at a Risser 2, indicating additional growth potential. A lateral spine radiograph demonstrated a left thoracolumbar curve of 46 degrees with a convexity to the right. Scoliosis morphology was a Risser 0, indicating additional growth potential. A lateral spine radiograph demonstrated a left thoracolumbar curve of 46 degrees with a convexity to the right. Scoliosis morphology was a Risser 0, indicating additional growth potential.

Because of the severity of her scoliosis, the fact that she had growth potential remaining, and the strong likelihood that the curve would continue to progress into adulthood, spinal fusion surgery was recommended, and a tricortical bone graft was performed.

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Sarah Gutknecht, D.N.P., is a certified nurse practitioner specializing in pediatric orthopaedics. Gutknecht sees children with a variety of orthopaedic conditions, including scoliosis and other spine conditions. She has worked at Gillette Children’s Specialty Healthcare in St. Paul, Minn., since 1991.

Gutknecht received a bachelor of science degree in nursing, a master of science degree in pediatric nursing, and a doctorate in nursing practice from the University of Wisconsin-Madison. In 1991, she joined Gillette Children’s Specialty Healthcare in St. Paul, Minn., as a staff nurse in the Pediatric Orthopaedics Program. She completed her orthopaedic residency at the University of Minnesota and became certified by the Pediatric Nursing Certification Board in acute care and primary care.

Gutknecht is certified by the American Board of Orthopaedic Surgery and the Minnesota Board of Medical Practice, and she is a member of the American Academy of Orthopaedic Surgeons, the North American Spine Society, the Society for Pediatric Oncology and Hematology, the Orthopaedic Society of North America, Société Internationale de Chirurgie Orthopédique et de Traumatologie, the American Orthopaedic Association, the American Academy of Orthopaedic Surgeons, and the Society for Pediatric Oncology and Hematology. She is a member of the American Academy of Orthopaedic Surgeons, the North American Spine Society, the Society for Pediatric Oncology and Hematology, the Orthopaedic Society of North America, Société Internationale de Chirurgie Orthopédique et de Traumatologie, the American Orthopaedic Association, the American Academy of Orthopaedic Surgeons, and the Society for Pediatric Oncology and Hematology.

Gutknecht is a member of the National Association of Pediatric Nurse Practitioners and the Pediatric Nursing Certification Board and is a member of the Pediatric Orthopaedics Practitioners Board and the National Association of Pediatric Nurse Practitioners.

John Lonstein, M.D., is an orthopaedic surgeon at Gillette Children’s Specialty Healthcare in St. Paul, Minn. He graduated from the University of Wisconsin-Madison School of Medicine. After 20 years of practice, he completed his orthopaedic residency at the University of Minnesota and became certified by the American Board of Orthopaedic Surgery and the Minnesota Board of Medical Practice. He is a member of the American Academy of Orthopaedic Surgeons, the North American Spine Society, the Orthopaedic Society of North America, Société Internationale de Chirurgie Orthopédique et de Traumatologie, the American Orthopaedic Association, the American Academy of Orthopaedic Surgeons, and the Society for Pediatric Oncology and Hematology.
Dr. Lonstein's appointments include staff surgeon with the Twin Cities Spine Center and Pediatric Orthopaedic Society of North America, the Scoliosis Research Society, the American SICOT, North American Spine Society, and American Orthopaedic Association. Tom Novacheck, M.D., is an orthopaedic surgeon at Gillette Children's Specialty Healthcare in St. Paul, Minn. He graduated from the University of Wisconsin-Madison Medical School, completed orthopaedic residency at Northwestern Memorial Hospital and at the Children’s Orthopaedic Center in Chicago, and completed his orthopaedic residency at the University of Minnesota. He began working at Gillette in 1972 and has served as chief of staff at Gillette since 1997. He is head of the scoliosis service at Gillette.

Gutknecht is certified by the American Board of Orthopaedic Surgery and the Minnesota State Board of Medical Examiners. Her professional associations include the Scoliosis Research Society, American Academy of Orthopaedic Surgeons, Orthopaedic Society of North America, Society International de Chirurgie Orthopédique et de Traumatologie (SICOT), North American Spine Society, and American Orthopaedic Association. Dr. Gutknecht’s appointments include staff surgeon with the Twin Cities Spine Center and clinical professor, Department of Orthopaedic Surgery, University of Minnesota. Dr. Gutknecht’s appointments include staff surgeon with the Twin Cities Spine Center and clinical professor, Department of Orthopaedic Surgery, University of Minnesota.

Tom Novacheck, M.D., is an orthopaedic surgeon at Gillette Children’s Specialty Healthcare in St. Paul, Minn. He is also director of Gillette’s James R. Gage Center for Gait and Motion Analysis. Novacheck’s research has focused on cerebral palsy, scoliosis and other complex orthopaedic conditions in children and adolescents. He is board certified by the American Board of Orthopaedic Surgery and the American Board of Pediatrics. Novacheck is certified by the Pediatric Nursing Certification Board in acute and primary care. He is also board certified as a clinical specialist in developmental disabilities. He is a fellow of the American Academy of Orthopaedic Surgeons and of the American Orthopaedic Association, the American Academy of Orthopaedic Surgeons and the Twenty-First Century Orthopaedic Association.

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