PHYSICIAN Update

Lucile Packard Children's Hospital
STANFORD UNIVERSITY MEDICAL CENTER

A publication of the Physician Referral Liaison Service Spring 2001

Children's Heart Center

at Lucile Packard Children's Hospital at Stanford

WITH A FOCUS ON CLINICAL INNOVATION, THE CHILDREN'S HEART CENTER ADDRESSES CONGENITAL AND ACQUIRED CARDIOVASCULAR DEFECTS OF ALL KINDS - FROM THE COMMONPLACE TO THE RARE AND COMPLEX - WITH A FULL CONTINUUM OF DIAGNOSTIC AND THERAPEUTIC SERVICES. REFLECTING ITS ACTIVE RESEARCH COMPONENT, THE CENTER OFFERS REFERRING PHYSICIANS A CONSTANT FLOW OF NEW TECHNIQUES AND PROTOCOLS TO PALLIATE AND CURE.

The Center emphasizes minimally invasive surgical repair of congenital defects. Novel mini-sternotomy surgical intervention—employing cardioscopy robotics and a combination of regional and general anesthesia—results in shortened recovery periods, fewer complications, less pain, better cosmetic results and reduced costs. Minimally invasive surgery is most commonly performed for repair of atrial septal defects, ventricular septal defects, patent ductus arteriosus and valvular abnormalities. Less common and more complex operations are also performed and considered on an individual basis.

Conventional and investigational diagnostic approaches are offered through the Center's pediatric cardiology service. Central in cardiac evaluation and treatment planning is transthoracic, transesophageal and fetal echocardiography. Additional noninvasive diagnostic options employ imaging modalities such as 3-D spiral CT and MRI and angiography as well as traditional tools, including 24-hour Holter monitoring and tilt-table testing. The Center also houses Northern California's only cardiopulmonary testing lab for children.

The Center's comprehensive cardiac catheterization program includes right and left heart catheterization, angiography, endomyocardial biopsy, balloon angioplasty and valvuloplasty, coil embolization, and endovascular stent placement. Through continuing innovations in transcatheter technology, many children are now successfully treated at the Center with catheter-based techniques as an alternative to surgery. Balloon valvuloplasty has replaced surgery for most children with aortic and pulmonary stenosis, and balloon angioplasty is being successfully employed to treat defects such as coarctation of the aorta and branch pulmonary artery stenosis.

The Center's interventional cardiologists are now investigating the use of novel techniques, such as balloon pulmonary angioplasty to treat chronic thromboembolic pulmonary hypertension. Conjointly with industry, the Center's researchers are developing new tools, techniques and devices to treat valvular disease and septal defects, and research protocols currently in development will further enhance applications for interventional repairs of complex defects.

Cardiologists and cardiac surgeons work collaboratively to determine the safest, most effective option—transcatheter or surgery. In some cases, a combination of the two is performed, e.g., interoperative stenting during surgery (performed as two separate procedures in most other centers).

The pediatric arrhythmia service within the Center—one of the largest programs of its kind in the U.S.—addresses the full range of rhythm disorders, from common supraventricular tachycardias through the most complex postoperative arrhythmias. The Center's conventional and investigational therapies for cardiac arrhythmias include radiofrequency catheter ablation techniques and new pharmacological regimens.

A cornerstone of the Center is pediatric heart transplantation. Children—from neonates to adolescents—have received heart, heart-lung, double-lung and single-lung transplants for diverse conditions, including severe congenital heart disease, hypertension, fibrotic

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See pages 2-3 for CME article abstract on minimally invasive cardiac surgery

Pediatric Minimally Invasive Cardiac Surgery

Improved Outcomes with Self-esteem Preservation

MICHAEL D. BLACK, MD

CHIEF, CARDIAC SURGERY

Congenital heart disease remains surprisingly common, affecting nearly one percent of all newborns. It has been estimated that approximately 32,000 children were born with heart defects in 2000 in the United States, a large proportion of which will require intervention.

For the neonate, infant, or child undergoing cardiac surgery, the smaller incisions enabled by emerging minimally invasive techniques mean less tissue disruption and discomfort, faster recovery, and better cosmetic results. For the surgeon, this smaller workspace presents several challenges: decreased vision, less room for hands and instruments to work, and no room for an assistant's hand. Despite these limitations and demands, minimally invasive procedures are rapidly becoming the future of pediatric cardiovascular surgery.

The external pressures for change remain diverse and strong, and procedures such as ours at Lucile Packard Children's Hospital— which potentially reduce hospital resources while improving cosmetics and maintaining patient safety—will be supported on multiple levels. A child can safely undergo complex "open-heart" procedures while staying only one to three days in the hospital. A well-placed two-inch incision is all that remains of this brief hospitalization.

Since the majority of pediatric procedures remain "open," requiring cardiopulmonary bypass (CPB), innovations and/or modifications of already established techniques likely will have important adult medical applications. However, distinct anatomical features separate children from their adult counterparts, which has delayed and limited the initial deployment of robotic technologies to cardiac surgery. We have sequentially addressed these potential hurdles and have modified our techniques accordingly:

- A relatively small thoracic cavity as compared to the diseased and enlarged heart;
- Small calibre femoral vessels, which cannot be cannulated successfully and do not allow the routine initiation of cardiopulmonary bypass;
- The potential for future maldevelopment of the osseous chest and breast tissue with multiple portal sites and non-sternotomy incisions.

Children and young adults undergoing cardiac procedures typically have maldevelopment of the chest wall due to the abnormal size and positions of the underlying cardiac chambers. Several alternative incisions are currently available to access the mediastinal structures, all of which have their limitations. Those undergoing thoracotomy must contend with possible future breast and pectoral muscle maldevelopment. The submammary incision may be accompanied by the development of hematoma, seroma, and nipple/breast anesthesias in as many as 10-15 percent of women. Breast tissue in both male and female infants does not reside solely beneath the nipple-areola complex, and is accordingly susceptible from both the surgical incision and by future scar formation. The recognition of long-term breast and pectoral muscle maldevelopment after antero/postero-lateral thoracotomies in children has provided the impetus to search for alternatives or modifications of previous incisions and techniques.

The diagnosis and/or treatment of children with congenital heart disease at Lucile Packard Children's Hospital routinely incorporates cardioscopy, active venous suction, epidural/spinal anesthesia, and most recently, robotic video assistance. This interdisciplinary combination has optimized not only cosmetics and utilization of hospital resources, but has maintained the safety and consistency of the surgical interventions. While some remain skeptical of change, legitimate concerns over children's safety, procedure length, and the duration of hospitalization have been addressed in our initial and/or intermediate experience, demonstrating no untoward mortality or significant morbidity.

Our initial experience with the correction of "simple" defects has enabled the repair of more complicated defects utilizing the "mini"-sternotomy. Significant technological advancement will be required to enable improved micro-maneuvering of the cameras and instruments within the neonatal heart.

One such advancement may be the use of robotic video assistance. We have found cardioscopy robotics to be an extremely valuable first step toward improving the controlled and predictable manipulations/ visualization required with the mini-hemisternotomy incision. Our first-generation robot has been modified to correct both simple and complex types of congenital heart

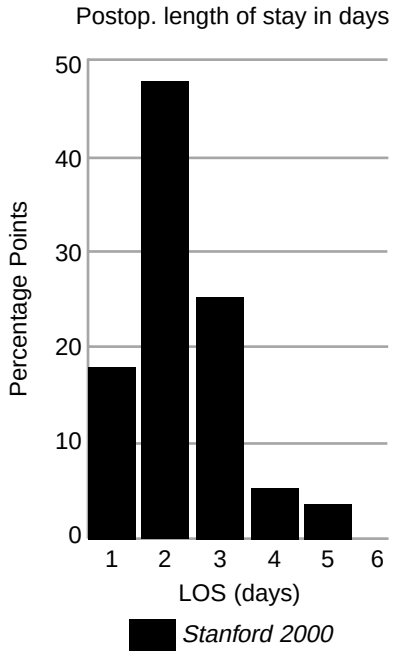
defects through incisions no larger than two inches. Ongoing developments at Packard Children's Hospital should enable further improved robotic function, reducing potentially disfiguring thoracic ports and standardizing the procedures, to allow widespread acceptance in the medical community.

Intracardiac imaging using cardioscopy remains a useful surgical adjuvant, improving both visualization and documentation during minimally invasive surgery. With smaller incisions, it is imperative that visualization be optimized for safety and teaching purposes. We have routinely employed cardioscopy to aid in the diagnosis and/or repair of a multitude of congenital heart defects for that very reason.

Ongoing developments at our institution should allow for the repair of selective intracardiac lesions using telemanipulation (full robotic assistance) without the use of cardiopulmonary bypass in the very near future.

In summary, congenital defects can be repaired via the "mini"-hemisternotomy in a safe and reproducible manner, as compared to a traditional full sternotomy approach. The introduction of intracardiac imaging has permitted the repair of more complex congenital lesions, both as an aid to surgical visualization and as a teaching tool. Robotic video assistance with a virtual port has allowed for the evolution of the transsternal approach, without limiting robotic video assistance as a transthoracic procedure. As experience accumulates, and as instrumentation and imaging technology improve, it will be possible to repair most forms of congenital heart disease utilizing a minimally invasive approach, resulting in reduced utilization of hospital resources and possible avoidance of cardiopulmonary bypass.

Reduction in Utilization of Hospital Resources (p=0.014)



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- Fill in the form below to order the full article abstracted here, a list of questions and an evaluation form.
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- Read the article, answer the questions and complete the evaluation form.
- Return the questions with your answers, a copy of the receipt for the article received and the completed evaluation form to the address above.

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Individuals will receive certification for one hour of CME credit if they receive a passing grade by answering 70% of the questions correctly.

For more information, please contact the Office of Continuing Medical Education by phone at (650) 497-8554, by fax at (650) 497-8585, or by e-mail at lpchcme@medcenter.stanford.edu

Please send me the article "Pediatric Minimally Invasive Heart Surgery: Improved Outcomes with the Preservation of Self-Esteem" by Michael Black, M.D., a list of questions and an evaluation form.

Name

Affiliation

Address

City State Zip

Signature

A check for $30 payable to Lucile Packard Children's Hospital is attached.

Children's Heart Center: cont.

lung disease, cystic fibrosis and bronchopulmonary dysplasia. Currently, Packard is the only center in Northern California offering implantation of a left ventricular assist device for children awaiting transplantation.

Profiles of Service Chiefs

Michael D. Black, M.D.
Service Chief, Pediatric Cardiothoracic Surgery
Director, Children's Heart Center

Medical School: University of Toronto, Toronto, Ontario
Internship: University of Toronto/The Toronto Hospital
Residency: University of Ottawa, Ottawa, Ontario
Fellowship: The Hospital for Sick Children, Toronto, Ontario

Daniel Bernstein, M.D.
Service Chief, Pediatric Cardiology
Associate Director
Children's Heart Center

Medical School: New York University, New York
Residency: Montefiore Medical Center, New York
Fellowships: Albert Einstein College of Medicine, New York and University of California, San Francisco

New Resources for Referring Physicians

In 2001, Lucile Packard Children's Hospital at Stanford is introducing two additional resources for referring physicians.

Physician Referral Directory
A user-friendly directory with comprehensive information about the hospital's medical and surgical programs and services. Available in hard copy and on the Web, the directory includes complete, current information for seeking consultation with faculty and making referrals to the hospital.

www.lpch.org
The "For Physicians" section of the hospital's Web site includes the referral directory as well as a complete listing of the hospital's medical staff with contact information. For the public, the site offers over 6,000 pages of easy-to-understand health information for children and their parents and useful information for expectant parents.

Children's Heart Center

KEY NUMBERS

24-hour access to Heart Center
1 (866) 213-2727

24-hour emergency consultation
(650) 497-8000
Ask for the on-call cardiologist

Heart Center Referrals
(650) 723-7913
or call
(650) 497-8000
Ask for the on-call cardiologist

KEY CONTACTS

Pediatric Cardiology
Daniel Bernstein, M.D., Service Chief

Pediatric Cardiothoracic Surgery
Michael Black, M.D., Service Chief

Electrocardiography Laboratory
David Rosenthal, M.D.,
Medical Director

Arrhythmia Service/ECG Laboratory
George Van Hare, M.D.,
Medical Director

Cardiac Catheterization/Angiography
Jeffrey Feinstein, M.D.,
Medical Director

Heart Transplantation and Advanced Cardiac Therapies Center
Daniel Bernstein, M.D.,
Program Director

Center physicians and staff are committed to timely, ongoing communication with referring physicians. As a back-up, a member of the hospital's Physician Referral Liaison Service is available to assist referring physicians.
Call (800) 756-5000 or send an e-mail to **referral@medcenter.stanford.edu.**

Faculty Update

NEW DEAN

Philip Pizzo, M.D. became dean of Stanford University School of Medicine in April. Previously, he was physician-in-chief at Children's Hospital in Boston and chairman of pediatrics at Harvard Medical Center. Dr. Pizzo is known for his work in cancer and the treatment of children with HIV.

NEW ASSOCIATE DEAN RESEARCH

Ann Arvin, M.D. professor of pediatrics and professor of microbiology and immunology, has been appointed associate dean of research. She works half-time in the dean's office while continuing her work in vaccine approaches to the prevention of childhood viral diseases.

NEW ASSOCIATE DEAN MEDICAL EDUCATION

Bert Glader, M.D., Ph.D. has assumed the role of associate dean of postgraduate medical education. He had been chief of hematology/oncology and he continues to participate in clinical and educational activities in hematology/oncology, including supervision of the red cell hematology laboratory.

NEW SERVICE CHIEF HEMATOLOGY/ONCOLOGY

Michael Link, M.D. is the chief of the division of pediatric oncology, hematology and bone marrow transplantation for the School of Medicine and director of oncology, hematology and bone marrow transplantation services at Lucile Packard Children's Hospital. He is active in several national organizations, including the Children's Oncology Group, American Society of Clinical Oncology and American Cancer Society.

NEW APPOINTMENTS

Dermatology
Joanna Badger, M.D.
Hayes Gladstone, M.D.

Neurology
Robert Fisher. M.D.
Terrance Sanger, M.D.

Radiation Oncology
Iriss Gibbs, M.D.

General Pediatrics
Aralis Santiago-Plaud, M.D.
Antonia Zazueta, M.D.

Adolescent Medicine
John Steever, M.D.

Neurosurgery
Victor Chun-Kee Tse, M.D.

Radiology
Kevin Woolley, M.D.
Lawrence Chow, M.D.

Anesthesia
Afshin Abdollahi, M.D.
Stephen Coleman, M.D.
Alice Edler, M.D.
Ethan Jackson, M.D.
Howard Williams, M.D.

Obstetrics & Gynecology
Ruth Crystal, M.D.
Amreen Husain, M.D.
Deidre Lyell, M.D.

Cardiothoracic Surgery
John Mitchell, M.D.

Nephrology
Jane Tan, M.D.

CME Programs in 2001

JUNE 23 - 30

Pediatric Potpourri for the Primary Care Practitioner: Alaskan Cruise
Course faculty will provide the latest practical information on the diagnosis and management of ocular emergencies, pediatric infections and common GI conditions in children; issues surrounding circumcision; and evaluation and stabilization of critically ill children prior to transport.

JULY 20 - 21

Ninth Annual Pediatric Update: LPCH at Stanford
Highlighting recent advances and issues in pediatrics, the conference will combine lectures, seminars, case studies, workshops, question-and-answer sessions, and meet-the-professor breakfasts. Opportunities to discuss with faculty issues encountered in private practice will also be offered.

NOVEMBER 2 - 4

Neonatal-Perinatal Medicine Update: Hyatt Regency, Kauai
Featuring plenary sessions, workshops and concurrent sessions on neonatal, perinatal and pediatric medicine topics, this conference will offer participants an opportunity for casual interaction with Stanford University faculty.

Designed for pediatricians, family practice physicians, nurses and allied health professionals with an interest in primary care pediatrics, each of these programs awards category one credit toward the AMA Physician's Recognition Award and category one credit toward continuing education requirements for license renewal by nurses. **For more information, contact:** Elinor Meyer, M.Ed., CME Coordinator
Lucile Packard Children's Hospital
725 Welch Road
Palo Alto, CA 94304
lpchcme@medcenter.stanford.edu
(650) 497-8554

Pediatric Imaging Update

A new $7.5-million, 5,300-square-foot imaging suite at Lucile Packard Children's Hospital will open in the fall, offering improved access to advanced MRI and CT within a pediatric-focused environment.

The new suite will house Northern California's only MRI dedicated to children, and includes a sedation and anesthesia area that was designed with the pediatric anesthesia division. (Most children under the age of 10 must be sedated prior to MRI or CT.)

The new facility will serve as the foundation of a major research effort at the medical center and it will play a role in Web-based continuing education for physicians and radiology technologists.

Pediatric ENT Services at Packard

Diagnostic evaluation and treatment of children with a wide range of conditions relating to the head and neck. Special services include clinics for hearing loss, craniofacial anomalies and voice disorders.

Faculty
Anna Messner, M.D., Chief Pediatric Otolaryngology

Kay Chang, M.D.

(650) 498-2565
To schedule a patient appointment

(650) 497-8773
For patient referral questions/information
Your call will be returned by a nurse practitioner within two days

For an urgent consultation, call the Physician Hotline at **(800) 995-5724** or call **(650) 497-8000** and ask the operator to page Dr. Messner, Dr. Chang or the ENT resident on call.

Pediatric Audiology Services at Packard

Audiologic assessment and management of infants and children with suspected, new and previously diagnosed hearing loss.

(650) 498-2565
To schedule a patient appointment

Medical Director
Anna Messner, M.D.

Staff
Jody Winzelberg, M.A., Audiology Manager
Melissa Price, M.A., Coordinator, Newborn Hearing Screening Program
Kristen Abels, M.A.
Erin Ginney, M.A.
Jennifer Philpott, M.A.

Movement Disorders Clinic at Packard

Diagnosis and treatment of children with movement disorders, including ataxia, bradykinesia, chorea, dystonia, myoclonus or tremor.

Access and referral to all currently available therapies for treatment of movement disorders, including physical therapy, medication, botulinum toxin injection, deep-brain stimulation neurosurgery and ablative neurosurgery.

Patients may be invited to participate in research projects conducted by faculty in neurology, biomechanical engineering, rehabilitation medicine and computer science.

Director
Terence Sanger, M.D., Ph.D.

Neurosurgery Faculty
Helen Bronte-Stewart, M.D.
Gary Heit, M.D.

(650) 723-6841
To schedule a patient appointment

(650) 723-6841
For patient referral questions/information

Outreach Services

Packard offers an outreach network of more than 60 clinical services in 30 locations throughout the Bay Area, Northern California and beyond.

In addition to the numerous outreach services offered in Northern California, Packard has developed clinics in Honolulu, Portland and Seattle, and we continue to look for new opportunities to expand the reach of our services.

CALIFORNIA

Clinical Services

Chico
Gastroenterology

Eureka
Genetics
Gastroenterology

Fremont
Cardiology
Infant Development

Fresno
Liver Transplantation

Monterey
Cardiology
Gastroenterology

Mountain View
Perinatalogy/
Neonatology

Oakland
Liver Transplantation

Redding
Gastroenterology

Sacramento
Liver Transplantation

Salinas
Adolescent Medicine

San Francisco
Adolescent Medicine
Cardiology

San Jose
Adolescent Medicine
Endocrinology
Gastroenterology
General Surgery
Urology

San Luis Obispo
Cardiology

San Mateo
Cardiology

Santa Clara
Gastroenterology

Santa Cruz
Endocrinology
Genetics
Gastroenterology
Infant Development
Infectious Diseases
Perinatal Diagnostic Center
Pulmonology
Rheumatology
Urology

Sonora
Neurology

Stockton
Cardiology
Gastroenterology

Ukiah
Genetics
Gastroenterology

Satellite Neonatal Intensive Care Nurseries

Fremont
Washington Hospital

Redwood City
Sequoia Hospital

Santa Cruz
Dominican Hospital

Perinatal/ Neonatal Educational Outreach

Fremont
Hayward
King City
Modesto
Mountain View
Pleasanton
Redwood City
Salinas
San Luis Obispo
Santa Cruz
Watsonville

HAWAII

Honolulu
Liver Transplantation

OREGON

Portland
Liver Transplantation

WASHINGTON

Seattle/Tacoma
Liver Transplantation

Clinical Services

Adolescent Medicine
Allergy/Asthma/Immunology
Anesthesia
Audiology/Infant Hearing
Bone Marrow Transplantation
Cardiology
Cardiothoracic Surgery
Craniofacial Anomalies/
Maxillofacial Surgery
Dermatology
Diabetes
Eating Disorders
Endocrinology
Gastroenterology/Nutrition/Hepatology
Genetics
Hand and Upper Extremity Surgery
Heart, Heart-Lung and
Lung Transplantation
Hematopoietic Stem Cell
Transplantation
Hematology
Infant Development Center
Infectious Diseases
Intensive Care
Kidney Transplantation
Liver Transplantation
Marfan's Syndrome/
Connective Tissue Disorders
Maternal and Fetal Medicine
Neonatology
Nephrology
Neurology
Neurosurgery
Nuclear Medicine
Oncology
Ophthalmology
Orthopedics
Otolaryngology
Pain Management
Pathology
Pediatrics, General
Pharmacy
Plastic Surgery
Psychiatry
Pulmonary Medicine/Cystic Fibrosis
Radiation Oncology
Radiology and Diagnostic Imaging
Respiratory Care
Rheumatology
Sleep Disorders
Speech and Language
Spina Bifida
Surgery, General Pediatric
Urology
Vascular Surgery

Important Contact Information

PHYSICIAN HOTLINE FOR REFERRAL & CONSULTATION

24-hour, immediate referral and consultation
(800) 995-5724
(650) 843-0136 fax
referral@medcenter.stanford.edu

CRITICAL CARE CONSULTATION & TRANSPORT

24-hour, immediate consultation for neonatal, pediatric and maternal critical care and transport issues
(650) 723-7342

HOSPITAL PAGE OPERATOR

24-hour access
(650) 497-8000

OTHER CONTACTS FOR REFERRING PHYSICIANS

Admissions
(800) 995-5724 / (650) 497-8221

Continuing Medical Education
(650) 497-8554

Diagnostic Imaging
(650) 497-8376

Radiologist Consult
(650) 497-8466

Grand Rounds
(650) 723-5168

Health Plan Services
(650) 736-1067

Medical Group Services
(650) 736-1067

Medical Staff Services
(650) 497-8566

Professional Services
Billing for Physicians
(650) 498-5785

Physician Referral Liaison Service

Coordinates referrals and serves as a communication link between hospital and referring physicians, medical groups and health plans

Monday - Friday 8 a.m. - 5 p.m.
(800) 756-5000/(650) 498-2526 fax
referral@medcenter.stanford.edu

After-Hours Triage Service for Physicians

Registered nurses answer calls from parents when physician offices are closed (weekday evenings, weekends and holidays)
From 5:30 p.m. - 7 a.m. Monday through Thursday
From 5:30 p.m. on Friday through 7 a.m. on Monday
For information, call **(650) 497-8225**

Lucile Packard Children's Hospital
at Stanford
725 Welch Road Palo Alto, CA 94304

Physician Update is published three times a year as part of an ongoing effort to serve the needs of physicians who refer to Lucile Packard Children's Hospital at Stanford. To share comments or secure more information, contact:

Mary Dybdahl, Manager
Physician Referral Liaison Service
Lucile Packard Children's Hospital
725 Welch Road, Palo Alto, CA 94304
(800) 756-5000
mary.dybdahl@medcenter.stanford.edu

Physician Update Advisors:

Harvey Cohen, M.D., Ph.D.
Chief of Staff
Lucile Packard Children's Hospital
Chairman, Department of Pediatrics
Stanford University School of Medicine

Kenneth Cox, M.D.
Chief Medical Officer
Lucile Packard Children's Hospital
Professor, Department of Pediatrics
Stanford University School of Medicine