turning knowledge into practice

America's Best Children's Hospitals 2007 Methodology

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Table of Contents

List of Tables

List of Appendixes

I. Introduction

U.S. News has ranked hospitals in pediatrics since the launch of the yearly "America's Best Hospitals" rankings in 1990, but only on the basis of reputation as determined by an annual survey of board-certified pediatricians. Data-driven quality measures were incorporated into most of the other ranked specialties, but comparable measures in pediatrics were unavailable. For example, Medicare data (i.e., MedPAR) are used to determine mortality in other specialties. While some children are treated under Medicare, thanks to legislatively mandated changes in Medicare rules over time, their number is low and falls into narrowly defined categories. Thus no large mortality database exists for pediatric inpatients.

Reliable structural measures have been nearly impossible to construct for pediatrics. Hospitals generally report volume, advanced technologies, and patient services for the entire institution and do not break out information related to pediatric care separately.

The prospect of continuing to rank this important specialty on reputation alone until experts could work out definitions of performance data and the best ways to collect and verify them was unsatisfying. As of early 2007, available information suggested that reaching a consensus merely on definitions could take another three to five years.

U.S. News therefore decided to enlist RTI International in developing an enhanced methodology for ranking children's hospitals in 2007. The methodology that emerged from this effort generated such rankings and is the subject of this report. It is a work in progress, the first in a series of planned improvements in pediatrics.

In brief, data obtained from a direct survey of a defined universe of children's hospitals in March of 2007 have been incorporated. The survey, which generated a response of nearly 93 percent, collected various structural and outcome data. The nature of these data are described in *Section III.* The new rankings were published separately from the adult specialty rankings in the "America's Best Hospitals" issue to highlight the change and to avoid possible confusion because of the superficial similarity of the rankings approach used in the pediatric and the adult specialties.* The pediatrics rankings still reflect the interrelationship between *structure*, *process*, and *outcomes* as described in the Donabedian paradigm,[1-5] the specific measures, weights, and scoring are quite different, reflecting the constraints on the available data.

* A description of the America's Best Hospitals 2007 Methodology report is available online at: www.rti.org/besthospitals

Structure, in the context of evaluating hospital quality, refers to resources directly related to patient care. Examples of structural measures factored into the pediatrics rankings include a calculation of the relative ratio of nurses to patients; availability of advanced care; and significant certification by a recognized external organization, such as designation as a Nurse Magnet hospital by the American Nurse Credentialing Center (ANCC) or designation by the Foundation for the Accreditation of Cellular Therapy (FACT).

The *process* of healthcare delivery also shapes the quality of care. This encompasses diagnosis, treatment, prevention, and patient education. In the pediatrics hospital rankings, as in the rankings of adult specialties, this is represented by a reputational score drawn from an annual survey of board-certified physicians.

The third and final member of the quality triad is *outcomes,* the most obvious of which is whether patients live or die.

Using robust and sensitive measures for each of the three Donabedian elements, the rankings identify the hospitals that provide the best care in pediatrics.

II. Eligibility

In general, hospitals were eligible for ranking in 2007 if they were classified by the National Association for Children's Hospitals and Related Institutions (NACHRI) as a freestanding children's hospital or a children's "hospital within a hospital"— essentially an autonomous pediatric service that does not occupy a standalone facility. As of March 1, 2007, 122 hospitals met this criterion. More information about NACHRI and their member hospitals can be found at www.childrenshospitals.net.

III. Structure

The structural score is based on data related to the structural characteristics of the hospitals. These elements represent volume (expressed as number of discharges), technology, and other features that characterize the hospital environment. The majority of these data elements are derived from the previously cited survey. Two external organizations provided additional measures: the American Nurse Credentialing Center (ANCC) and the Foundation for the Accreditation of Cellular Therapy (FACT).

A. Source: *U.S. News & World Report* Survey of Pediatric Hospitals

The majority of structural measures used in the Best Hospitals rankings for adult specialties come from the American Hospital Association (AHA) annual survey. It is not possible, however, to accurately characterize the technologies and services available for pediatric services in most multi-specialty hospitals based on these data. To address this lack of specificity, in March of 2007 *U.S. News* conducted a Survey of Pediatric Hospitals.[†] The survey was administered to 122 NACHRI member institutions. A total of 113 of the 122 hospitals participated in the survey, a response rate of 92.6%.[‡]

A useful quality measure needs to demonstrate significant variability among hospitals. After reviewing the results of the survey, a number of items were dropped from consideration because of lack of variability. A subset of survey questions were determined to have adequate discriminatory power across hospitals and were therefore used to develop the majority of the structural score for the rankings. These items can be found in *Appendix A* and are further described in detail below. The survey will be updated and fine-tuned over time to expand the number and types of measures to best reflect the quality of care in U.S. pediatric facilities.

Advanced Care

The elements in the structural category called the advanced care index were selected because they are key technologies and advanced care services and thus are expected from a "best" pediatric hospital.

Technology

Many hospitals provide access to advanced care services through the hospital's health system, a local community network, or a contractual arrangement or joint venture with another provider in the community. Both on and off-site services are taken into account when calculating the rankings; however, hospitals that provide more convenience to patients are rewarded for offering services onsite. Therefore, hospitals that provide a service such as image-guided radiation therapy are given 1 full point if it is provided onsite; hospitals that provide the service locally (but offsite) through a formal arrangement receive 0.5 point. A hospital receives no more than 1 point for each element in the index.

[†] The *U.S. News* Survey of Pediatric Hospitals was conducted by RTI International with input from NACHRI.

[‡] American Association for Public Opinion Research (AAPOR) standard response rate 2 (standard definitions are located on the Web at www.aapor.org/pdfs/standarddefs_ver3.pdf)

Five technologies are included in the advanced care index. Brief descriptions follow. They are taken from the *U.S. News* Survey of Pediatric Hospitals:

- **Image-Guided Radiation Therapy (IGRT).** Automated system that produces high-resolution x- ray images to pinpoint tumor sites, adjust patient positioning, and generally effectiveness and efficiency.
- **Intensity-Modulated Radiation Therapy (IMRT).** A type of three-dimensional radiation therapy that allows treatment to be targeted more precisely, decreasing the possibility of damage to normal tissue.
- **Shaped-Beam Radiation.** A non-invasive treatment using targeted beams of radiation that mirror the size and shape of a specific area of a tumor to shrink or destroy cancerous cells, thus minimizing the risk to nearby tissues.
- **Positron Emission Tomography (PET).** A nuclear medicine imaging technology using radioactive isotopes that emit positrons to produce composite pictures of the brain and heart at work. PET scanning produces sectional images depicting metabolic activity or blood flow rather than anatomy. The isotopes are created in a cyclotron or generator.
- **Stereotactic Radiosurgery.** A radiotherapy modality that delivers high-dose radiation to a discrete treatment area, often in one treatment session. This category of procedures includes the use of proprietary technologies such as Gamma knife, Cyberknife, and others.

Data on other advanced care technologies and services were collected in the Survey of Pediatric Hospitals. However, as noted above, they were not included in the rankings because of lack of variability in the survey responses collected from participating hospitals.

Palliative Care

A qualifying palliative care program for pediatrics is an organized and staffed program for children nearing the end of life or living with conditions limiting lifespan or quality of life. The purpose of such a program is to minimize pain and discomfort, provide emotional and spiritual support for children and their families, assist with financial guidance and social services, and support decision making. For inclusion in the Best Children's Hospital rankings, a program had to meet the following standards:

Staffing, at a minimum, consists of 1 FTE physician providing direct patient care, 1 FTE nurse coordinator, and a social worker, certified child life specialist, or pastoral

counselor. All must have had specific training in palliative care. The team meets at least weekly to consult on current patients.

The Survey of Pediatric Hospitals asked participating hospitals to provide the average number of pediatric palliative care consults per month over the past year.

Palliative care programs were categorized based on two criteria: (1) whether or not a program is offered that meets the definition, and (2) if so, the average number of consults per month. Only hospitals that indicated that they offered a palliative care program either within their hospital (or a subsidiary) or through their health system, network, or local provider via a formal arrangement or joint venture were eligible to receive points for palliative care. Within this group, hospitals whose volume of consults fell between the 75th and 89th percentile received 0.5 point; those who volume put them at or above the 90th percentile received 1 point. All other hospitals received 0 points. The score was then included in the advanced care index.

FACT accreditation

This designation indicates that as of April 1, 2007, a hospital met standards set by the Foundation for the Accreditation of Cellular Therapy (FACT) for transplantation of cells for treatment of cancer in pediatrics. FACT-accredited programs represent the highest level of care in the handling and use of cellular tissue in the treatment of cancer. Programs that have undergone FACT accreditation can be certified as an adult or as a pediatric service provider and as offering two types of transplant services: autologous and allogeneic. Hospitals accredited by FACT as of April 1, 2007, as a pediatric service provider were considered.

Hospitals were awarded a half a point if accredited only for autologous transplants, in which a patient's own cells are removed and then returned following radiation therapy. A full point was awarded to hospitals accredited for allogeneic transplants, in which cells are donated by another person (allowing a greater number and more kinds of cell transplants) or for both autologous and allogeneic transplantation. This score was then included in the advanced care index. The 2007 rankings included no hospitals accredited only for autologous transplants, so only Yes (1 point) or No (0 points) is displayed in the rankings. Currently accredited FACT facilities are listed at: http://www.factwebsite.org/FacilitySearch.aspx?SearchType=FACT.

Nurse staffing

Nurse staffing is a ratio reflecting the number of nurses relative to the number of inpatients. The numerator is the number of on-staff registered nurses (RNs), expressed in full-

time equivalents (FTEs), devoted to inpatient care for pediatrics. Only nurses with RN degrees from approved nursing schools and current state registration (i.e., licensing) are included for consideration. The patient measure in the denominator is the average daily number of pediatric inpatients. The components of this index were derived from the *U.S. News* Survey of Pediatric Hospitals. As with other index scores in the methodology, an inverse logit transformation was applied to eliminate the influence of wide variation.[§]

Nurse Magnet hospital

"Nurse Magnet" is a formal designation by the American Nurses Credentialing Center (ANCC), an arm of the American Nursing Association (ANA), indicating that a hospital meets specific standards of nursing excellence. The list of Nurse Magnet hospitals is updated throughout the year as hospitals apply for designation and re-designation status. Hospitals accorded Nurse Magnet hospital status by the ANCC as of April 1, 2007, received 1 point. The current list of Nurse Magnet hospitals is at: www.nursingworld.org/ancc/magnet/facilities.html.

Discharges (all patients)

This measure reflects total pediatric discharges (excluding newborns but including neonatal discharges).[**] Hospitals were instructed to use data from 2006 or the most recent year for which data was available. Only one hospital reported using data from 2005, which was due to the affect of hurricane Katrina. To reduce the effect of extreme values (or outliers) the volume data were subjected to an inverse logit transformation.

B. Standardization and weighting

Standardization was performed on the structural measures to ensure that the data were distributed normally, with a mean of zero. This step is necessary to prepare the data for factor analysis, restoring balance so that trimmed and untrimmed measures have the same influence on the final score.

To combine the structural variables from the Survey of Pediatric Hospitals and external databases, the elements are weighted to create a composite measure. Using factor analysis, we reduced the number of variables to force a one-factor solution. Factor analysis is a statistical technique used to identify underlying similarities among the structural variables. More simply,

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[§] A description of the inverse logit transformation can be found in the America's Best Hospitals 2007 Methodology report, available online at: http://health.usnews.com/usnews/health/best-hospitals/methodology_report.pdf

[**] The age cut-off for pediatric patients was determined by the individual hospitals.

variables that are strongly associated with one another receive lower factor loadings than those that have a unique distribution. The factor loadings, or weights, are applied to reduce the effect of multiple variables that because of their strong association may measure the same concept. ***Table 1*** provides the factor weights assigned to each element for 2007.

Table 1. Factor Weights for Structural Variables

Variable	Weight
Advanced care	81.2
Nurse staffing	34.5
Nurse Magnet hospital	60.2
Discharges (all patients)	50.1

IV. Outcomes

Mortality data for hospitals were also obtained from the Survey of Pediatric Hospitals. Certain information was requested regarding surgical outcomes for specific procedures: patient volume, inpatient deaths, and deaths within 30 days of admission (30-day mortality). Hospitals reported this information to reflect calendar year 2006 or the most recent year for which data were available.

While 30-day mortality would have been the preferred outcome measure, hospitals generally could not provide accurate 30-day mortality figures. To ensure comparability, only inpatient mortality data were used. Similarly, data from all outcomes measures in the survey could not be included mostly because (1) volume measures for some procedures were very low across all hospitals, or (2) insufficient variation existed between hospitals. Of the data collected on surgical outcomes, only three surgical procedures were used in the 2007 rankings: *Tetrology of Fallot, Bone Marrow Transplantation, and Excising a Malignant Brain Tumor*.

A. Measures

Mortality data are reported using the *International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM)*. The ICD-9-CM is the official system used by the National Center for Health Statistics and the Centers for Medicare and Medicaid Services to assign codes to diagnoses and procedures associated with hospital utilization in the United

States.[6] The descriptions of the measures and relevant ICD-9 diagnosis or procedure codes for each item are shown below.

- **Tetrology of Fallot**. Surgical correction of a set of congenital heart defects, involving closure of a hole in the ventricular septum with a patch and removing an obstruction to right ventricular outflow (pulmonary stenosis). Include only those patients with ICD-9 procedure code:
    - 35.81 Total repair of tetrology of Fallot.

- **Bone Marrow Transplantation**. A procedure that transplants healthy bone marrow stem cells into a patient whose bone marrow is not functioning properly. It may be done for several conditions, including hereditary blood diseases, hereditary metabolic diseases, hereditary immune deficiencies, and various cancers. The healthy bone marrow may be taken from the patient prior to chemotherapy or radiation treatment (autograft) or from a donor (allograft). To answer this question, include only those patients with ICD-9 procedure code:
    - 41.0x Bone marrow or hematopoietic stem cell transplant

- **Excise malignant brain tumor**. Only surgically accessible tumors are of interest in answering this question. Include only those patients with one of the following malignant brain tumor diagnosis codes and one of the indicated corrective surgical procedure codes.

  ICD-9 diagnosis codes:
    - 191.x Malignant neoplasm of brain
    - 192.0 Malignant neoplasm of cranial nerves
    - 192.1 Malignant neoplasm of cerebral meninges

  ICD-9 procedure codes:
    - 01.24 Other craniotomy
    - 01.25 Other craniectomy
    - 01.41 Operations on thalamus
    - 01.42 Operations on globus pallidus
    - 01.51 Excision of lesion or tissue of cerebral meninges
    - 01.52 Hemispherectomy
    - 01.53 Lobectomy of brain
    - 01.59 Other excision or destruction of lesion or tissue of brain

B. Scoring

The mortality index was calculated in a three-step process described below. It takes the volume of cases into consideration as well as the inpatient mortality rate.

- **Step 1: Establish a sufficient volume of surgical cases.** Hospitals were eligible to receive points for mortality according to the volume of each of the procedures performed. To be eligible at Step 1, hospitals must have performed a volume at or above the 75th percentile for that procedure as reported by all participating hospitals. Those that met the requirement proceeded to the next step. Others did not receive points for the specific procedure. ***Table 2*** presents the 75th percentile discharge volume for these procedures.

Table 2. 75th Percentile Discharge Volumes

Procedure	Volume at 75th Percentile
Tetrology of Fallot	18
Excise Malignant Brain Tumor	28
Bone Marrow Transplantation	23

- **Step 2: Calculate mortality ratio and award points to top performing hospitals.** The mortality ratio was calculated in the standard manner, dividing the number of inpatient deaths by the number of patients who received the procedure during the reporting period. While no adjustment has been made for case severity, the ratio should roughly reflect the quality of inpatient care. For Tetrology of Fallot and Excise Malignant Brain Tumor, hospitals with a mortality ratio at or above the 50^{th} percentile (where the 100^{th} percentile represents the best mortality ratio) received 2 points, those between the 10^{th} and 50^{th} percentile received 1 point, and all other hospitals received 0 points. For Bone Marrow Transplant, hospitals with a mortality ratio that fell at or above the 70^{th} percentile (where the 100^{th} percentile represents the best mortality ratio) received 2 points, those between the 30^{th} and 70^{th} percentile received 1 points, all other hospitals received 0 points.

- **Step 3: Summarize mortality points in a mortality index.** Points awarded in Step 2 were added, resulting in a score ranging from 0 to 6.

V. Process

The reputational component of the rankings can be viewed as the process measure, representing a hospital's reputation for a wide variety of processes that lead to the quality of care provided. It also can be seen as a form of peer review. The score is based on cumulative responses from three surveys of board-certified pediatricians, conducted for 2005, 2006, and

2007, in which those surveyed were asked to nominate up to five "best hospitals" in pediatrics, irrespective of expense or location, for patients with serious or difficult conditions.

A sample of 200 board-certified physicians was selected in each year from the American Medical Association Physician Masterfile, a database of more than 850,000 physicians.[††] The sample of physicians included members of the American Board of Pediatrics in the areas of Pediatrics and Adolescent Medicine. In addition, the sample for the 2007 physician survey included a sub-sample of 50 Neonatologists. The physician sample was stratified by the four census regions (http://www.census.gov/geo/www/us_regdiv.pdf). The final aggregated sample included both federal and nonfederal medical and osteopathic physicians residing in all 50 states and the District of Columbia. ***Table 3*** shows the number of completed surveys (n) and the response rates for the 3 years of survey data used in the 2007 rankings. The average response rate for the 3 years of data collection was 48.3%, with a slight downward trend each year.

Table 3. Yearly Response Rates (2005–2007)

Specialty	2005		2006		2007		3-year total	
	n	%	n	%	n	%	n	%
Pediatrics	100	53.8	91	47.2	82	43.9	273	48.3

Table 4 shows the total number of completed surveys (n) and the average response rate by region for the three years of survey data. All response rates are calculated using AAPOR standard response rate 6.[‡‡]

Table 4. Average Response Rates by Region (2005–2007)

Specialty	Northeast		Midwest		South		West	
	n	%	n	%	n	%	n	%
Pediatrics	66	47.1	62	44.6	82	57.7	63	43.4

The methods used for the Pediatric rankings were the same used for the America's Best Hospitals rankings of adult specialties. For details, consult the 2007 America's Best Hospitals Methodology (http://health.usnews.com/usnews/health/best-hospitals/methodology_report.pdf).

[††] Does not include medical students, residents, retirees, or deceased physicians.

[‡‡] American Association for Public Opinion Research (AAPOR) standard response rate 6 (standard definitions are located on the Web at www.aapor.org/pdfs/standarddefs_ver3.pdf)

VI. U.S. News score

In calculating the *U.S. News score*, structure and outcomes each received one-sixth of the weight; the process component received two-thirds of the weight. The process component retains the greatest percent of the weight to maintain consistency with the rankings over the past few years. Although each of the three measures represents a specific aspect of quality, a single score provides a result that is easy to use and understand and portrays overall quality more accurately than would any one of the three elements individually. The rankings for the top 30 pediatric hospitals by *U.S. News* score are shown in *Appendix B*.

The formula for calculating the *U.S. News* score is in Equation (1). Please note that this formula is meant for illustrative purposes only. The formula cannot be used directly to calculate a score for an individual hospital; the standardized data values are adjusted based on the distribution of measures across all eligible hospitals. The *U.S. News* score can be thought of as a simple weighted sum of structural, process, and outcome measures.

$$Score = \{[(S_1 \times F_i) + (S_2 \times F_2) + \ldots + (S_n \times F_n)] + 4 * [(P \times \sum_{1}^{n} F)] + [(M \times \sum_{1}^{n} F)]\}, \quad (1)$$

where

Score = *U.S. News* score for Pediatrics,
S_n = standardized value for structural indicator *n* (STRUCTURE),
F_n = factor loadings for structural indicator *n,*
P = standardized nomination score (PROCESS) , and
M = standardized mortality score (OUTCOMES).

For presentation purposes, we transformed the raw *U.S. News* scores to a 100-point scale, where the top hospital received a score of 100. The formula for the transformation is shown in Equation (2):

$$(Raw\ U.S.\ News\ score_i - minimum_i) / range_i. \quad (2)$$

VII. Future Improvements

Similar to the "America's Best Hospitals" methodology for adult specialties, the pediatrics methodology will be examined and refined each year to better measure pediatric hospital quality. In future years, RTI will closely examine current measures and new data sources in the changing context of hospital organization across the nation. Our goal is to continually improve and enhance the quality of the rankings, with help from *U.S. News & World Report*, various research advisors, and the hospital community. Here we present several methodological improvements that we are considering for future rankings.

For the 2008 rankings, we intend to expand the pediatrics rankings to include several pediatric sub-specialties such as cancer, cardiology, neurology and others. In addition, we intend to revise the Survey of Pediatric Hospitals to include additional measures of overall hospital quality as well as specific indicators of quality within pediatric subspecialties. We will continue to investigate further methods for measuring and appropriately utilizing pediatric mortality. As the measures included in the rankings become more robust, the *U.S. News* score may also shift to a more equal distribution of weights between the three components of the methodology.

Contact Information

We welcome suggestions and questions. Readers and users of the rankings are encouraged to contact the Best Hospitals research team at the address listed below. This and methodology reports for the adult rankings can be viewed or downloaded online in their entirety from the RTI International Web site at http://health.usnews.com/usnews/health/best-hospitals/methodology_report.pdf. Specific questions or comments about this report can be sent via e-mail to BestHospitals@rti.org.

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Appendix A

U.S. News & World Report Survey of Pediatric Hospitals

Subset of Questions Used in the Rankings

Technology:

1. Please indicate which of the following your hospital owns or provides.

	(1) Yes, by hospital or a subsidiary	(2) Yes, by health system or network, or by a local provider through a formal arrangement or joint venture	(3) Unavailable through any of these providers
Image-guided radiation therapy (IGRT)	O	O	O
Intensity-modulated radiation therapy (IMRT)	O	O	O
Shaped-beam radiation therapy	O	O	O
Positron emission tomography (PET)	O	O	O
Stereotactic radiosurgery	O	O	O

Definitions:

Image-guided radiation therapy (IGRT): Automated system that produces high-resolution x- ray images to pinpoint tumor sites, adjust patient positioning, and generally make treatment more effective and efficient.

Intensity-modulated radiation therapy (IMRT): A type of three-dimensional radiation therapy, which improves the targeting of treatment delivery in a way that is likely to decrease damage to normal tissues and allows varying intensities.

Shaped-beam radiation therapy: A precise, non-invasive treatment that involves targeted beams of radiation that mirror the exact size and shape of a specific area of a tumor to shrink or destroy cancerous cells, thus minimizing the risk to nearby tissues.

Positron emission tomography (PET): A nuclear medicine imaging technology using radioactive isotopes that emit positrons to produce composite pictures of the brain and heart at work. PET scanning produces sectional images depicting metabolic activity or blood flow rather than anatomy. The isotopes are created in a cyclotron or generator.

Stereotactic radiosurgery: A radiotherapy modality that delivers high-dose radiation to a discrete treatment area, often in one treatment session. This category of procedures includes the use of technologies such as gamma knife, Cyberknife, and other related technologies.

Palliative Care:

2. Please indicate whether your pediatric hospital provides this service.

	(1) Yes, by hospital or a subsidiary	(2) Yes, by health system or network, or by a local provider through a formal arrangement or joint venture	(3) Unavailable through any of these providers
Palliative care	O	O	O

For the following question, please refer to calendar year 2006 (or the most recent year for which data are available):

3. What was the average number of palliative care consults per month at your pediatric hospital? _____

Definitions:

Palliative care: An organized and staffed program for children nearing the end of life or living with lifespan-limiting conditions, for the purpose of minimizing pain and discomfort, providing emotional and spiritual support for children and their families, assisting with financial guidance and social services, and supporting decision-making. The program must meet the following standards: Staffing, at a minimum, consists of one **FTE** physician providing direct patient care, one FTE nurse coordinator, and a social worker, certified child life specialist, or pastoral counselor. All must have had specific training in palliative care. The team meets at least weekly to consult on current patients.

Nursing Staffing:

Trauma Nurses

How many full-time equivalent (FTE) registered nurses (RNs) devoted to inpatient care are on staff at your pediatric hospital? *Exclude agency, traveling, supervisory, and outpatient-only nursing staff.* _____

Patient Volume

For the following questions, refer to calendar year 2006 or the most recent year for which data are available:

4. What was the average daily inpatient census (inpatient days divided by 365, or by number of days hospital was open if under 365) of your pediatric hospital in the past year? _____

Discharges (all patients):

For the following questions, refer to calendar year 2006 or the most recent year for which data are available:

5. What was the total number of discharges (excluding newborns but including neonatal discharges) of your pediatric hospital in the past year? _____

Definitions:

Registered Nurses (RNs): Nurses who have graduated from approved schools of nursing and who are currently registered by the state. They are responsible for the nature and quality of all nursing care that patients receive. Do not include any registered nurses more appropriately reported in other occupational categories, such as facility administrators, and therefore listed under "All other personnel."

Full-time Equivalent (FTE): The number of hours normally worked in a particular job category over the full-year reporting period represents 1 FTE. If a full-time nurse normally works 40 hours a week, 1 FTE for nursing would be 2,080 hours over 12 months. If the total hours worked by all RNs add up to 208,000 over one year, for example, the number of FTE nurses is 10.

Surgical Outcomes:

For each of the following surgical procedures, provide the number of patients who received each procedure at your pediatric hospital, the number of in-hospital deaths, and the number of deaths from admission to 30 days after admission. The numbers should reflect calendar year 2006 or the most recent year for which data are available. If using other than calendar-2006 data, indicate the year in the "notes" column at right.

	Number of patients	Deaths Deaths (inpatient)	(30 days)	Notes
a. Tetrology of Fallot	_____	_____	_____	_____
b. Bone marrow transplantation	_____	_____	_____	_____
c. Excise malignant brain tumor	_____	_____	_____	_____

To be sure your answers correspond to the definitions used in this survey, roll the mouse over the underlined terms to check the definitions.

If you would like to print a copy of the survey and definitions for your reference, click on: PediatricHospitalsSurvey.pdf

Definitions:

Tetrology of Fallot: Surgical correction of a set of congenital heart defects, involving closure of a hole in the ventricular septum with a patch and removing an obstruction to right ventricular outflow (pulmonary stenosis). To answer this question, include only those patients with ICD-9 procedure code:

- Pr 35.81 Total repair of tetrology of Fallot.

Bone marrow transplantation: A procedure that transplants healthy bone marrow stem cells into a patient whose bone marrow is not functioning properly. It may be done for several conditions, including hereditary blood diseases, hereditary metabolic diseases, hereditary immune deficiencies, and various cancers. The healthy bone marrow may be taken from the patient prior to chemotherapy or radiation treatment (autograft) or from a donor (allograft). To answer this question, include only those patients with ICD-9 procedure code:

- 41.0x Bone marrow or hematopoietic stem cell transplant.

Excise malignant brain tumor: Only surgically accessible tumors are of interest in answering this question. Include only those patients with one of the following malignant brain tumor diagnosis codes and one of the indicated corrective surgical procedure codes.

ICD-9 diagnosis codes:

- 191.x Malignant neoplasm of brain
- 192.0 Malignant neoplasm of cranial nerves
- 192.1 Malignant neoplasm of cerebral meninges

ICD-9 procedure codes:

- 01.24 Other craniotomy
- 01.25 Other craniectomy
- 01.41 Operations on thalamus
- 01.42 Operations on globus pallidus
- 01.51 Excision of lesion or tissue of cerebral meninges
- 01.52 Hemispherectomy
- 01.53 Lobectomy of brain
- 01.59 Other excision or destruction of lesion or tissue of brain

Appendix B

2007 Pediatric Rankings

				Mortality (0-6 points)						Advanced care		
Rank	Hospital	U.S. News Score	Reputation (%)	Tetralogy of Fallot	Brain surgery	Bone marrow transplant	Discharges (all patients)	Nurse staffing	Nurse Magnet hospital	Technology (of 5)	Palliative care program	FACT accredita-tion
1	Children's Hospital of Philadelphia	100.0	45.5	1	2	1	24,120	3.1	Yes	2.5	0.5	Yes
2	Children's Hospital Boston	96.5	42.0	2	2	1	21,835	3.8	No	5.0	0.0	Yes
3	Johns Hopkins Hospital, Baltimore	54.2	21.5	0	2	1	8,296	2.6	Yes	5.0	0.0	Yes
4	Children's Hospital, Denver	50.3	16.7	2	1	2	9,840	2.7	Yes	2.5	0.0	Yes
5	Rainbow Babies and Children's Hospital, Cleveland	46.3	15.5	2	2	0	8,095	2.3	Yes	5.0	0.0	Yes
6	Texas Children's Hospital, Houston	44.0	14.4	2	2	0	21,230	3.0	Yes	2.0	0.0	Yes
7	Cincinnati Children's Hospital Medical Center	43.1	19.7	0	0	1	16,482	1.7	No	2.5	1.0	Yes
8	New York-Presbyterian Univ. Hosp. of Columbia and Cornell	38.7	11.7	2	2	0	12,253	3.0	No	5.0	0.0	Yes
9	Children's Hospital and Regional Medical Center, Seattle	34.1	12.0	2	0	1	12,381	2.2	No	1.0	0.5	Yes
10	Lucile Packard Children's Hospital, Palo Alto, Calif.	33.1	10.1	1	1	1	13,358	3.1	No	5.0	0.0	Yes
11	Children's National Medical Center, Washington, D.C.	32.8	7.6	2	2	1	13,106	2.2	No	2.5	0.0	Yes
12	Columbus Children's Hospital	31.7	5.9	2	2	1	14,931	2.4	Yes	2.5	0.0	Yes
13	Children's Hospital of Pittsburgh of UPMC	31.6	11.0	0	2	0	13,328	2.8	No	5.0	0.0	Yes
14	Children's Healthcare of Atlanta	30.7	5.7	2	2	1	22,436	3.0	No	3.0	0.0	Yes
15	St. Louis Children's Hospital	30.4	6.4	2	2	0	14,682	3.4	Yes	2.5	1.0	Yes
16	UCSF Children's Hospital, San Francisco	29.3	6.8	2	0	2	4,963	3.8	No	5.0	0.0	Yes
17	Childrens Hospital Los Angeles	28.8	8.3	2	1	0	11,295	2.1	No	4.0	0.0	Yes
18	Primary Children's Medical Center, Salt Lake City, Utah	27.6	2.6	2	2	2	12,138	3.5	No	3.0	0.0	Yes
19	Duke University Medical Center, Durham, N.C.	26.0	4.2	2	2	0	5,024	2.4	Yes	5.0	0.0	Yes
20	St. Jude Children's Research Hospital, Memphis	24.7	8.6	N.A.	0	2	2,574	3.8	No	2.5	0.0	Yes
21	Mattel Children's Hospital at UCLA, Los Angeles	23.0	7.6	0	0	1	5,297	2.2	Yes	5.0	0.0	Yes
22	University of Michigan C.S. Mott Children's Hospital, Ann Arbor	22.2	2.1	2	0	2	8,360	4.7	No	5.0	0.5	Yes
23	Vanderbilt University Medical Center, Nashville	22.0	3.0	1	0	2	14,871	2.0	Yes	5.0	0.0	Yes
24	Long Island Jewish Medical Center, New Hyde Park, N.Y.	21.0	1.9	2	2	0	11,769	2.7	No	5.0	0.5	No
25	Children's Memorial Hospital, Chicago	20.7	7.9	0	0	0	9,604	4.1	Yes	3.0	0.0	Yes
26	Miami Children's Hospital	20.5	3.0	1	2	0	12,594	1.9	Yes	3.0	0.0	Yes
27	Children's Hospitals and Clinics of Minnesota, Minneapolis	19.7	0.3	2	2	0	13,143	4.6	Yes	3.0	1.0	No
28	Children's Medical Center Dallas	18.1	2.3	2	1	0	22,655	3.1	No	3.0	0.0	No
29	Mayo Clinic, Rochester, Minn.	18.1	3.1	0	0	2	3,654	3.1	Yes	5.0	0.0	Yes
30	Children's Hospital of Wisconsin, Milwaukee	16.7	1.9	1	0	1	22,221	3.4	Yes	2.0	1.0	Yes