Results from the National Survey of Ambulatory Surgery (NSAS)

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National Center for Health Statistics
Division of Health Care Statistics
Overview

- National Center for Health Statistics (NCHS)
- National Survey of Ambulatory Surgery (NSAS)
  - Survey Design
  - Data
    - Overall
    - Anesthesia
  - Next Steps
NCHS

- **Who we are:**
  - Department of Health and Human Services (DHHS)
    - Centers for Disease Control and Prevention (CDC)
    - National Center for Health Statistics (NCHS)
- **NCHS is the Nation’s principal health statistics agency**
  - compile statistical information to guide actions and policies to improve the health of the population
Our health statistics allow us to:

- document the health status of the population
- monitor trends in health status and health care delivery
- support biomedical and health services research
- provide information to guide and evaluate health policy decisions and programs
NCHS Major Surveys

- Vital Statistics
- NHANES (National Health and Nutrition Examination Survey)
- NHIS (National Health Interview Survey)
- NHCS (National Health Care Surveys)
National Health Care Surveys

- Provider-based surveys which include:
  - National Survey of Ambulatory Surgery (NSAS)
  - National Hospital Discharge Survey (NHDS)
  - National Hospital Ambulatory Medical Care Survey (NHAMCS)
  - National Ambulatory Medical Care Survey (NAMCS)
  - National Nursing Home Survey (NNHS)
  - National Home & Hospice Care Survey (NHHCS)
National Health Care Surveys

- Obtaining information about the:
  - facilities that supply health care,
  - services rendered, and
  - characteristics of the patients served

- Data are collected directly from the establishments and/or their records rather than from the patients
National Health Care Surveys

- National probability samples
- Voluntary
- Maintain confidentiality of providers and patients
NSAS

- National probability sample of freestanding and hospital-based ambulatory surgery centers and their patients

- Last conducted 1994 – 1996
Scope of the NSAS

- Two stage probability design
- First stage: sample of facilities
  - Freestanding ASCs
  - Hospital-based ASCs
- Second stage: sample of ambulatory surgical visits
Scope of the NSAS

- Surgical and nonsurgical procedures performed on an ambulatory (outpatient) basis
  - General operating rooms
  - Dedicated ambulatory surgery rooms
  - Other specialized rooms such as endoscopy units and cardiac catheterization labs
  - Pain block was included in the 2006 NSAS
Endorsements

- Federated Ambulatory Surgery Association (FASA)
- Society for Ambulatory Anesthesia (SAMBA)
- American Health Information Management Association (AHIMA)
- American Association of Ambulatory Surgery Centers (AAASC)
- American College of Surgeons (ACS)
- American Academy of Ophthalmology (AAO)
NSAS Participation

- Total of 696 facilities sampled
  - Freestanding ASCs
    - 472 sampled
    - 295 participated → 74% response rate
  - Hospital-based ASCs
    - 224 sampled
    - 142 participated → 75% response rate
- Sample of about 10-12 records per month per facility
  - Collected data on 52,233 visits
Data Collection

- The US Census Bureau collected data
- Induction interview
  - obtain data on practice or facility characteristics
  - train staff
- Preferred method was ASC/ hospital staff completing Medical Abstract forms
Medical Abstract Form
Medical Abstract Form

- Patient characteristics
  - Date of Birth / Age
  - Sex
  - Race
  - Ethnicity
  - ZIP Code
Medical Abstract Form

- Visit characteristics
  - Expected source of payment
    - Principal
    - Other Sources
  - Disposition
Medical Abstract Form

- Surgical characteristics
  - Surgical times
  - Type of anesthesia
  - Anesthesia provider
  - Diagnoses
  - Procedures
  - Symptoms present during or after surgery
Medical Abstract Form

- Follow-up information
  - Contact with patient within 24 hours
Coding Systems Used

- ICD-9-CM codes reported
  - Up to 7 diagnoses coded
  - Up to 6 procedures coded
- CPT-4 codes not used
  - American Medical Association's CPT-4 codes are proprietary information
  - Needed a coding system that we could release publicly
Facility Questionnaire

2006 National Survey of Ambulatory Surgery
Facility Questionnaire

Prepared for the
U.S. Department of Health and Human Services
 Centers for Disease Control and Prevention
National Center for Health Statistics

by
U.S. Department of Commerce
Census Bureau

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Facility Profile – Continued

10. How is it implemented? [If yes] In what plan? [If yes, please specify]
   [ ] Other
   [ ] ICIP
   [ ] CDC

11. What is the planned time for implementation? [ ] Yes/No
   [ ] 1 year
   [ ] 2 years
   [ ] 3 years
   [ ] 4 years
   [ ] 5 years
   [ ] More than 5 years

12. What was the reason for the delay? [ ] Yes/No
   [ ] Other

13. Was it completed a survey in accordance? [ ] Yes/No
   [ ] Other

14. What is the expected time for the survey to be completed? [ ] Yes/No
   [ ] 1 year
   [ ] 2 years
   [ ] 3 years
   [ ] 4 years
   [ ] 5 years
   [ ] More than 5 years

15. What were the reasons for the delay? [ ] Yes/No
   [ ] Other

16. What is the expected time for the survey to be completed? [ ] Yes/No
   [ ] 1 year
   [ ] 2 years
   [ ] 3 years
   [ ] 4 years
   [ ] 5 years
   [ ] More than 5 years
Facility Questionnaire

- **Facility information**
  - Accreditation, ownership
  - After hours care
  - Payer Mix
  - Emergency capabilities
    - Unscheduled cases
    - Travel to the closest acute care hospital
    - Life support

- **Staff profile**
  - # medical staff
  - Physician specialties
  - Physician board certification
  - Affiliation with teaching hospital

- **Postoperative care**
  - Time in recovery
  - Extended care
Quality control procedures

- Forms reviewed by Census supervisors before being keyed
- Rekey of forms
  - Rate of discrepancy <0.3%
- Edit checks performed by NCHS
Estimation from the Sample to the Nation

- Each sampled record will represent hundreds of other visits

- Components of the estimation procedure:
  - Inflation by reciprocals of sampling selection probabilities
  - Adjustment for non-response
Confidentiality

- Confidentiality protected by Title 42, USC, Section 242m(d)
- Identifying information may be stripped
- Unable to identify either the facility or the individual patient
- Disclosure Review Board approves release
- Users agree not to try to identify providers/facilities or individual patients or publish small cells
- This protocol was approved by the NCHS Institutional Review Board
Who uses NSAS data?

- Health professional associations
- State and federal policy makers
- Health services researchers
- Epidemiologists
- Hospitals and ASCs
- Universities and medical schools
- Broadcast & print media
- Medical supply companies
2006 NSAS Data
## Number and rate of visits, 1996 vs. 2006

<table>
<thead>
<tr>
<th>Utilization measure</th>
<th>1996</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of visits</td>
<td>20,838,000</td>
<td>35,225,000</td>
</tr>
<tr>
<td>Visits to freestanding ASCs</td>
<td>3,313,000</td>
<td>15,243,000</td>
</tr>
<tr>
<td>Visits to hospital-based ASCs</td>
<td>17,524,000</td>
<td>19,982,000</td>
</tr>
<tr>
<td>Rate of visits per 1,000 population</td>
<td>78.9</td>
<td>118.1</td>
</tr>
<tr>
<td>Rate to freestanding ASCs</td>
<td>12.6</td>
<td>51.1</td>
</tr>
<tr>
<td>Rate to hospital-based ASCs</td>
<td>66.4</td>
<td>67.0</td>
</tr>
</tbody>
</table>

Excludes ambulatory surgery patients admitted to hospitals as inpatients

Source: CDC/NCHS, National Survey of Ambulatory Surgery (NSAS)
Percent distribution of procedures by setting, 1996

- Inpatient: 40.4 million (56%)
- Ambulatory*: 31.5 million (44%)
- Freestanding: 5.1 million
- Hospital-based: 26.4 million

*Excludes ambulatory surgery patients admitted to hospitals as inpatients

Sources: CDC/NCHS, National Survey of Ambulatory Surgery (NSAS) and National Hospital Discharge Survey (NHDS)
Percent distribution of procedures by setting, 2006

Inpatient 46.0 million 44%
Ambulatory* 57.8 million 56%
Hospital-based 32.4 million
Freestanding 25.4 million

*Excludes ambulatory surgery patients admitted to hospitals as inpatients

Sources: CDC/NCHS, National Survey of Ambulatory Surgery (NSAS) and National Hospital Discharge Survey (NHDS)
Rate of ambulatory procedures by age and sex, 2006

Source: CDC/NCHS, National Survey of Ambulatory Surgery (NSAS)
Most common ambulatory procedures, 1996

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Number of procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cataract removal</td>
<td>2,367,000</td>
</tr>
<tr>
<td>Endoscopy of large intestine</td>
<td>1,913,000</td>
</tr>
<tr>
<td>Removal of skin lesion</td>
<td>877,000</td>
</tr>
<tr>
<td>Arthroscopy of knee</td>
<td>629,000</td>
</tr>
<tr>
<td>Repair of inguinal hernia</td>
<td>531,000</td>
</tr>
<tr>
<td>Myringotomy</td>
<td>524,000</td>
</tr>
</tbody>
</table>

Source: CDC/NCHS, National Survey of Ambulatory Surgery (NSAS)
Most common ambulatory procedures, 2006

- Endoscopy of large intestine: 5,907,000
- Endoscopy of small intestine: 3,544,000
- Extraction of lens: 3,136,000
- Injection of agent into spinal canal: 2,763,000
- Insertion of prosthetic lens: 2,639,000
- Injection of therapeutic substance: 1,681,000

Number of procedures

Source: CDC/NCHS, National Survey of Ambulatory Surgery (NSAS)
Procedures performed by setting and body system, 2006

Number of procedures

Sources: CDC/NCHS, National Survey of Ambulatory Surgery (NSAS) and National Hospital Discharge Survey (NHDS)
### Characteristics of ambulatory surgery patients by facility type, 2006

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Freestanding</th>
<th>Hospital-based</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>53.5</td>
<td>51.7</td>
</tr>
<tr>
<td>Female (%)</td>
<td>58.3</td>
<td>57.3</td>
</tr>
<tr>
<td>Race/Ethnicity (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not stated</td>
<td>63.3</td>
<td>15.9</td>
</tr>
</tbody>
</table>

Source: CDC/NCHS, National Survey of Ambulatory Surgery (NSAS)
Characteristics of ambulatory surgery patients by facility type, 2006

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Freestanding</th>
<th>Hospital-based</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disposition (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Routine</td>
<td>95.4</td>
<td>91.3</td>
</tr>
<tr>
<td>Observation status</td>
<td>&lt;1</td>
<td>1.7</td>
</tr>
<tr>
<td>Recovery care facility</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Inpatient admission</td>
<td>&lt;1</td>
<td>1.4</td>
</tr>
<tr>
<td>Surgery cancelled</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Other</td>
<td>1.4</td>
<td>2.1</td>
</tr>
<tr>
<td>Not stated</td>
<td>2.5</td>
<td>3.0</td>
</tr>
</tbody>
</table>

Source: CDC/NCHS, National Survey of Ambulatory Surgery (NSAS)
Types of anesthesia provider by ASC location, 2006

Freestanding
- Anesthesiologist: 40%
- CRNA: 17%
- Surgeon/other physician: 17%
- Multiple providers: 14%
- Unknown: 9%

Hospital-based
- Anesthesiologist: 35%
- CRNA: 17%
- Surgeon/other physician: 16%
- Multiple providers: 18%
- Unknown: 14%

Source: CDC/NCHS, National Survey of Ambulatory Surgery (NSAS)
Type of anesthesia by ASC location, 2006

Source: CDC/NCHS, National Survey of Ambulatory Surgery (NSAS)
Calculation of surgical times, 2006

- Surgical time = Time surgery ended – Time surgery began
- OR time = Time out of OR – Time in OR
- Post Op time = Time out of PO care – Time in PO care
- Total time = Time out of PO care – Time in OR
AHRQ’s Procedure Class grouper

- ICD-9-CM procedures are grouped into one of 4 broad categories
  - Minor Diagnostic
  - Minor Therapeutic
  - Major Diagnostic
  - Major Therapeutic

Procedure Classes

- **Minor Diagnostic** - Non-operating room procedures that are diagnostic
  - e.g., 87.03 CT scan of head

- **Minor Therapeutic** - Non-operating room procedures that are therapeutic
  - e.g., 02.41 Irrigate ventricular shunt

Procedure Classes

- **Major Diagnostic** – Operating room procedures that are diagnostic
  - e.g., 01.14 Open brain biopsy

- **Major Therapeutic** – Operating room procedures that are therapeutic
  - e.g., 39.24 Aorta-renal bypass

# Average surgical times, 2006

<table>
<thead>
<tr>
<th></th>
<th>Surgical Time (min)</th>
<th>OR Time (min)</th>
<th>Post Op Time (min)</th>
<th>Total Time (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>30.4</td>
<td>53.9</td>
<td>67.0</td>
<td>125.0</td>
</tr>
<tr>
<td>Minor Diagnostic</td>
<td>20.8</td>
<td>41.1</td>
<td>60.6</td>
<td>107.1</td>
</tr>
<tr>
<td>Minor Therapeutic</td>
<td>27.0</td>
<td>47.7</td>
<td>58.1</td>
<td>111.1</td>
</tr>
<tr>
<td>Major Diagnostic</td>
<td>42.1</td>
<td>73.0</td>
<td>92.7</td>
<td>167.9</td>
</tr>
<tr>
<td>Major Therapeutic</td>
<td>41.3</td>
<td>68.0</td>
<td>78.1</td>
<td>149.6</td>
</tr>
</tbody>
</table>

Source: CDC/NCHS, National Survey of Ambulatory Surgery (NSAS)
Symptoms present during or after surgery, 2006

- Any symptom listed in the medical record during or after surgery
- Symptoms occurred infrequently (4.15%)
  - Nausea
  - Hypertension
  - Vomiting
  - Bleeding

Source: CDC/NCHS, National Survey of Ambulatory Surgery (NSAS)
## Presence of symptoms by type of anesthesia, 2006

<table>
<thead>
<tr>
<th>Type of anesthesia</th>
<th>Percent that experienced symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>6.0%</td>
</tr>
<tr>
<td>Regional</td>
<td>4.3%</td>
</tr>
<tr>
<td>Multiple types</td>
<td>3.9%</td>
</tr>
<tr>
<td>IV</td>
<td>3.8%</td>
</tr>
<tr>
<td>Topical/ local</td>
<td>2.5%</td>
</tr>
<tr>
<td>Other/ not specified</td>
<td>2.6%</td>
</tr>
<tr>
<td>MAC</td>
<td>2.3%</td>
</tr>
</tbody>
</table>

Source: CDC/NCHS, National Survey of Ambulatory Surgery (NSAS)
Follow up with patients

- Follow up within 24 hours after surgery
  - 55% yes
  - 15% no
  - 30% unknown

- Patient was reached
  - 40% yes
  - 14% no
  - 28% unknown, 19% missing

Source: CDC/NCHS, National Survey of Ambulatory Surgery (NSAS)
Plans for the future
Publications

- Data released to the public on the web via de-identified public use data file (July/August)
- Reports and publications using NSAS data
  - National Health Statistics Reports
  - NCHS Series 13 Report on inpatient and ambulatory procedures
- Articles for peer-reviewed journals
Re-fielding the NSAS

- Incorporate the NSAS into the National Hospital Ambulatory Medical Care Survey (NHAMCS)
  - Recognize the importance of collecting this data more frequently
  - Hospitals
    - Emergency departments
    - Outpatient departments
    - Hospital-based ASCs
  - Freestanding ASCs
For more information on NSAS

- Check out our website:
  [www.cdc.gov/nchs/nsas.htm](http://www.cdc.gov/nchs/nsas.htm)

- Data released in July/August 2008.

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