

# **Medical Records Institute's Sixth Annual Survey of Electronic Health Record Trends and Usage for 2004**

The results of the MRI Survey of EHR Trends and Usage are displayed on this web site for you to review and refer to at no cost. A total of 808 individuals responded to the survey. However, to increase relevancy and reduce bias, responses from vendors, consultants, and payers are not included in the results. Therefore, the results that follow include only provider responses with a total database size of 436. The data includes responses from April 30<sup>th</sup> through June 11<sup>th</sup>, 2004. The EHR Survey includes the results from all sixteen questions in the survey, including the first four demographic questions.

The MRI Survey of EHR Trends and Usage reveals insights into the:

- Motivations driving the need for Electronic Health Record systems
- EHR applications and functions being implemented or planned
- IT platforms used to support EHR applications
- EHR configurations for different environments
- Data capture methods being employed
- Major barriers to implementing EHR systems
- Mobile/Wireless healthcare priorities, applications, platforms, and concerns

## **How to Interpret the Survey Results**

Users of this survey should keep mind that the method used to gather the information is not strictly scientific. The information in this survey is a compilation of data from individuals that chose to respond to email broadcasts inviting them to fill in the survey at the MRI or TEPR website. While the respondents to this survey are not representative of the medical community as a whole, they are clearly knowledgeable about healthcare IT solutions and plans. This level of knowledge among the respondents adds greatly to the value of the survey results.

The survey results should not be interpreted as a measure of the actual implementation levels of EHR and mobile/wireless applications for the healthcare industry. However, the results are valuable as an indicator of the relative implementation levels or plans of the respondents.

To facilitate comparison, the survey results include:

- Results from prior years if the wording of the questions is essentially the same from year-to-year.
- Market segment results whenever the total for an individual segment is over 100 respondents so that the margin-of-error remains within a reasonable range.

When the survey results are compared from year-to-year, the following three factors should be considered:

- The profile of respondent roles has been fairly consistent over the last three years.
- The profile of decision-makers has been fairly consistent over the last three years.
- The market segment respondent representation has shifted significantly. Over the last three years, the percentage of respondents from the Ambulatory sector has increased, while the percentage of respondents from the Hospital sector has decreased. This shift is depicted in Question 1.

To assist you in forming an appropriate level of confidence for interpreting the results, we have presented the actual number of individuals who responded to each question, plus the margin of error, in the preface or at the bottom of each table where appropriate.

**1. Which of the following best describes the environment where you spend most of your workday?**

| <b>Provider Environment</b> | <b>2002</b> | <b>2003</b> | <b>2004</b> |
|-----------------------------|-------------|-------------|-------------|
| Ambulatory                  | 26.3%       | 28.4%       | 44.5%       |
| Hospitals                   | 51.40%      | 38.5%       | 31.4%       |
| IHDSO                       | 12.10%      | 17.9%       | 14.9%       |
| Other                       | 10%         | 15.1%       | 9.6%        |
| Total Respondents           | 761         | 759         | 436         |

## 2. Which of the following best describes your role within your organization?

### Preface:

- IT Managers and Professionals include: Medical Information Systems Professionals (i.e., Analyst Strategic Planner, Chief Technology Officer); Health Information Manager, MIS Manager, CIS Manager; Vice President or Director of Information Systems or Chief Information Officer; Program, Applications, or Network Manager; Health Information Administrator, Manager, Director.
- Physicians and Nurses include: Physician; Nurse; Vice President of Medical Services, Medical Director, or Chief Medical Officer.
- Non-IT Management includes: President, Chief Executive Officer, or Executive VP; Vice President of Finance or Chief Operating Officer; Office Manager (Ambulatory Setting); Quality Manager, Officer, or Director; Privacy/Security Manager, Officer, or Director.

| <b>Role Categories</b>        | <b>2002</b> | <b>2003</b> | <b>2004</b> |
|-------------------------------|-------------|-------------|-------------|
| IT Managers and Professionals | 44.8%       | 45.0%       | 46.1%       |
| Physicians and Nurses         | 22.7%       | 23.0%       | 27.3%       |
| Non-IT Management             | 10.7%       | 19.0%       | 14.9%       |
| OTHER                         | 21.8%       | 13.0%       | 11.7%       |
|                               | 100.0%      | 100.0%      | 100.0%      |

| <b>Respondent Roles for 2004</b>                                                                      | <b>Number of Respondents</b> | <b>Percent of Total Respondents</b> |
|-------------------------------------------------------------------------------------------------------|------------------------------|-------------------------------------|
| Physician                                                                                             | 92                           | 21.1%                               |
| Health Information Manager, MIS Manager, CIS Manager                                                  | 54                           | 12.4%                               |
| Vice President or Director of Information Systems, or Chief Information Officer                       | 54                           | 12.4%                               |
| Medical Information Systems Professional (i.e., Analyst, Strategic Planner, Chief Technology Officer) | 45                           | 10.3%                               |
| Health Information Administrator, Manager, Director                                                   | 33                           | 7.6%                                |
| President, Chief Executive Officer, or Executive VP                                                   | 29                           | 6.7%                                |
| Vice President of Medical Services, Medical Director, or Chief Medical Officer                        | 16                           | 3.7%                                |
| Program, Applications, or Network Manager                                                             | 15                           | 3.4%                                |
| Vice President of Finance or Chief Operating Officer                                                  | 14                           | 3.2%                                |
| Nurse                                                                                                 | 11                           | 2.5%                                |
| Quality Manager, Officer, or Director                                                                 | 10                           | 2.3%                                |
| Privacy/Security Manager, Officer, or Director                                                        | 6                            | 1.4%                                |
| Office Manager (Ambulatory Setting)                                                                   | 6                            | 1.4%                                |
| Other                                                                                                 | 51                           | 11.7%                               |
|                                                                                                       | 436                          | 100%                                |

### 3. How would you describe your role in the EHR decision-making process?

| <b>Decision-Making Role</b> | <b>2002</b> | <b>2003</b> | <b>2004</b> |
|-----------------------------|-------------|-------------|-------------|
| I strongly influence.       | 53.4%       | 50.6%       | 53.4%       |
| I have some influence.      | 26.5%       | 28.7%       | 25.5%       |
| I make the final decision.  | 10.2%       | 13.4%       | 13.8%       |
| I have little influence.    | 8.5%        | 4.2%        | 4.8%        |
| I have no influence.        | n/a         | 2.8%        | 1.6%        |
| No Response                 | 1.2%        | 0.3%        | 0.9%        |
|                             | 100.0%      | 100.0%      | 100.0%      |

#### 4. Where do you work?

| <b>2002</b>                      | <b>2003</b>                      | <b>2004</b>                      |
|----------------------------------|----------------------------------|----------------------------------|
| United States of America (83.8%) | United States of America (84.9%) | United States of America (86.0%) |
| Canada (4.6%)                    | Canada (6.3%)                    | Canada (4.6%)                    |
| Great Britain (1.4%)             | Great Britain (0.9%)             | Belgium (0.9%)                   |
| Australia (1.1%)                 | Germany (0.9%)                   | Netherlands (0.7%)               |
|                                  | France (0.7%)                    | Hong Kong (0.7%)                 |
|                                  | Denmark (0.7%)                   | Great Britain (0.7%)             |
| Other (9.2%)                     | Other (5.6%)                     | Other (6.4%)                     |
| 761 Respondents                  | 759 Respondents                  | 436 Respondents                  |

## 5. What are the factors that are driving the need for Electronic Health Record (EHR) Systems within your organization?

### Preface:

- The results for this question cannot be compared directly to previous years, because this year the question is a combination of two separate questions from previous years.

### Analyzed by Market Segments

| Motivating Factors                                                                                         | 2004     | Hospital | Ambulatory | Other    |
|------------------------------------------------------------------------------------------------------------|----------|----------|------------|----------|
| The need to improve clinical processes or workflow efficiency                                              | 84.6%    | 83.9%    | 87.1%      | 81.0%    |
| The need to improve quality of care                                                                        | 83.3%    | 78.8%    | 86.1%      | 83.8%    |
| The need to share patient record information among healthcare practitioners and professionals              | 79.8%    | 87.6%    | 69.6%      | 88.6%    |
| The need to reduce medical errors (improve patient safety)                                                 | 76.4%    | 81.0%    | 69.6%      | 82.9%    |
| The need to improve clinical data capture                                                                  | 68.3%    | 67.9%    | 67.0%      | 71.4%    |
| The need to improve clinical documentation to support appropriate billing service levels                   | 67.7%    | 58.4%    | 78.4%      | 60.0%    |
| The need to provide access to patient records at remote locations                                          | 65.4%    | 62.0%    | 67.5%      | 65.7%    |
| The need to facilitate clinical decision support                                                           | 63.1%    | 69.3%    | 54.1%      | 71.4%    |
| The need to meet the requirements of legal, regulatory, or accreditation standards                         | 53.7%    | 48.9%    | 56.2%      | 55.2%    |
| The requirement to contain or reduce healthcare delivery costs                                             | 51.8%    | 47.4%    | 57.2%      | 47.6%    |
| The need to establish a more efficient and effective information infrastructure as a competitive advantage | 51.1%    | 46.7%    | 60.3%      | 40.0%    |
| Other                                                                                                      | 6.4%     | 5.8%     | 4.6%       | 10.5%    |
| Totals                                                                                                     | 436      | 137      | 194        | 105      |
| Margin of Error                                                                                            | +/- 4.7% | +/- 8.4% | +/- 7.0%   | +/- 9.6% |

### **Analyzed by Respondent Roles**

| <b>Motivations</b>                                                                                         | <b>Percent of Total Respondents</b> | <b>IT Managers and Professionals</b> | <b>Physicians and Nurses</b> | <b>Non-IT Management</b> |
|------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------------------|------------------------------|--------------------------|
| The need to improve clinical processes or workflow efficiency                                              | 84.6%                               | 86.6%                                | 84.9%                        | 81.0%                    |
| The need to improve quality of care                                                                        | 83.3%                               | 82.1%                                | 87.4%                        | 81.0%                    |
| The need to share patient record information among healthcare practitioners and professionals              | 79.8%                               | 89.1%                                | 70.6%                        | 73.3%                    |
| The need to reduce medical errors (improve patient safety)                                                 | 76.4%                               | 81.1%                                | 73.1%                        | 71.6%                    |
| The need to improve clinical data capture                                                                  | 68.3%                               | 72.6%                                | 67.2%                        | 62.1%                    |
| The need to improve clinical documentation to support appropriate billing service levels                   | 67.7%                               | 66.7%                                | 74.8%                        | 62.1%                    |
| The need to provide access to patient records at remote locations                                          | 65.4%                               | 67.2%                                | 63.0%                        | 64.7%                    |
| The need to facilitate clinical decision support                                                           | 63.1%                               | 69.2%                                | 57.1%                        | 75.9%                    |
| The need to meet the requirements of legal, regulatory, or accreditation standards                         | 53.7%                               | 54.2%                                | 54.6%                        | 51.7%                    |
| The requirement to contain or reduce healthcare delivery costs                                             | 51.8%                               | 50.2%                                | 53.8%                        | 52.6%                    |
| The need to establish a more efficient and effective information infrastructure as a competitive advantage | 51.1%                               | 46.8%                                | 54.6%                        | 55.2%                    |
| Other                                                                                                      | 6.4%                                | 5.5%                                 | 4.2%                         | 10.3%                    |
| Total Respondents                                                                                          | 436                                 | 201                                  | 119                          | 116                      |
| Margin of Error                                                                                            | +/- 4.7%                            | +/-6.9                               | +/- 9.0%                     | +/- 9.1%                 |

**6. Please identify the primary and secondary IT platforms that your EHR System is based on.**

**Preface:**

- When comparing the results from 2003 to 2004, take into consideration the shift in demographics (increase in Ambulatory respondents) and the margin of error.
- The percentages for Table B will add up to more than 100% because the respondents were asked to select all that apply.

**TABLE A: Primary IT Platforms selected**

|                         | <b>2003</b> | <b>2004</b> |
|-------------------------|-------------|-------------|
| Client Server           | 51.0%       | 55.1%       |
| Mainframe               | 28.0%       | 23.1%       |
| ASP                     | 6.0%        | 6.9%        |
| Website                 | 6.0%        | 5.4%        |
| Standalone PC           | 3.0%        | 4.2%        |
| Mobile/Wireless Systems | 4.0%        | 2.7%        |
| Remote Computing Option | 2.0%        | 0.9%        |
| Other                   | 0.0%        | 1.8%        |
| Total Respondents       | 611         | 334         |
| Margin of Error         | +/- 4.0%    | +/- 5.4%    |

**TABLE B: For those that selected a client server system as their primary IT platform**

| <b>Secondary Platform</b> | <b>2003</b> | <b>2004</b> |
|---------------------------|-------------|-------------|
| Mobile/Wireless Systems   | 33.3%       | 32.1%       |
| Website                   | 28.2%       | 27.2%       |
| Standalone PC             | 22.0%       | 19.6%       |
| Client Server             | 15.9%       | 13.0%       |
| Remote Computing Option   | 15.2%       | 14.7%       |
| Mainframe                 | 14.2%       | 11.4%       |
| ASP                       | 11.3%       | 9.8%        |
| Other                     | 1.3%        | 1.6%        |

## 7. What methods do you use to enter clinical information into your EHR?

### Preface:

- When comparing the results from 2003 to 2004, take into consideration the shift in demographics (increase in Ambulatory respondents) and the margin of error.
- The percentages will add up to more than 100% because the respondents were asked to select all that apply.

| <b>Free Text and/or Unstructured Data Entry</b>                                   | <b>2003 Total In Use</b> | <b>Used More Frequently</b> | <b>Used Less Frequently</b> | <b>2004 Total In Use</b> | <b>Used More Frequently</b> | <b>Used Less Frequently</b> |
|-----------------------------------------------------------------------------------|--------------------------|-----------------------------|-----------------------------|--------------------------|-----------------------------|-----------------------------|
| Using keyboard and mouse                                                          | 86.1%                    | 71.0%                       | 15.1%                       | 83.7%                    | 66.5%                       | 17.2%                       |
| Dictation/transcription (without speech recognition)                              | 69.8%                    | 57.0%                       | 12.8%                       | 68.6%                    | 54.8%                       | 13.8%                       |
| Using stylus with Tablet PC or PDA                                                | 33.5%                    | 11.9%                       | 21.6%                       | 37.0%                    | 14.8%                       | 22.2%                       |
| Dictation/transcription (with speech recognition)                                 | 30.5%                    | 8.7%                        | 21.8%                       | 31.7%                    | 10.5%                       | 21.2%                       |
| <b>Structured Data Entry</b>                                                      |                          |                             |                             |                          |                             |                             |
| Keyboard/mouse (using templates or fields or XML DTDs)                            | 75.3%                    | 65.5%                       | 9.8%                        | 75.7%                    | 66.5%                       | 9.2%                        |
| Touch screen                                                                      | 23.9%                    | 12.1%                       | 11.8%                       | 30.2%                    | 15.7%                       | 14.5%                       |
| Optical character recognition (OCR)                                               | 15.0%                    | 3.9%                        | 11.1%                       | 16.6%                    | 5.5%                        | 11.1%                       |
| Light pen                                                                         | 11.8%                    | 4.3%                        | 7.5%                        | 13.6%                    | 7.1%                        | 6.5%                        |
| <b>Input from other departmental systems within your institution</b>              | 61.1%                    | 46.5%                       | 24.6%                       | 61.3%                    | 50.8%                       | 10.5%                       |
| <b>Document Scanning</b>                                                          | 58.6%                    | 31.9%                       | 26.7%                       | 59.7%                    | 38.2%                       | 21.5%                       |
| <b>Input from other practitioners or EHR systems external to your institution</b> | n/a                      | n/a                         | n/a                         | 37.2%                    | 16.9%                       | 20.3%                       |
| <b>Input from Patients</b>                                                        | n/a                      | n/a                         | n/a                         | 25.8%                    | 12.9%                       | 12.9%                       |
| <b>Other data capture methods</b>                                                 | 6.4%                     | 5.1%                        | 1.3%                        | 4.6%                     | 3.7%                        | 0.9%                        |
| Total Respondents                                                                 | 611                      |                             |                             | 325                      |                             |                             |
| Margin of Error                                                                   | +/- 4.0%                 |                             |                             | +/- 5.4%                 |                             |                             |

**8. If you work in a Hospital, IHDSO, MCO or Other Healthcare Institution (and you have an EHR System), does it support...**

| <b>Hospital or other Healthcare Settings</b> | <b>2003</b> | <b>2004</b> |
|----------------------------------------------|-------------|-------------|
| Both Inpatient and Outpatient capabilities   | 82.3%       | 92.7%       |
| Inpatient capabilities only                  | 17.7%       | 7.3%        |
| Total Respondents                            | 362         | 327         |
| Margin of Error                              | +/- 5.2%    | +/- 5.4%    |

**9. If you work in an Ambulatory setting (and you have an EHR System), does it support...**

| <b>Ambulatory Setting</b>                           | <b>2003</b> | <b>2004</b> |
|-----------------------------------------------------|-------------|-------------|
| Integrated with Practice Management Applications    | 42.0%       | 40.7%       |
| Interfaced to a Separate Practice Management System | 34.9%       | 37.7%       |
| Standalone                                          | 23.1%       | 21.6%       |
| Total Respondents                                   | 281         | 199         |
| Margin of Error                                     | +/- 5.9%    | +/- 6.9%    |

## 10. Which of the following applications or functions do you have in use today or planned for implementation?

### Preface:

- Percentages are based on the total respondents for the survey (436).
- Margin of error for all portions of Question 10 is +/- 4.7%.
- The percentages will add to more than 100% because the respondents were asked to select all that apply.
- The Survey results for this question should not be interpreted as a measure of the actual implementation levels of EHR components for the healthcare industry as a whole. However, the results are valuable as an indicator of the relative implementation levels or plans of the respondents.

### A. EHR Administrative and Financial Applications

|                                                                            | In Use Today | Total Planned | 1 year | 2 years | 3 years | 4 or more years |
|----------------------------------------------------------------------------|--------------|---------------|--------|---------|---------|-----------------|
| Scheduling                                                                 | 58.0%        | 12.1%         | 7.3%   | 2.3%    | 0.9%    | 1.6%            |
| Patient appointments                                                       | 56.0%        | 13.3%         | 7.8%   | 3.0%    | 0.9%    | 1.6%            |
| Billing and accounts receivable                                            | 55.5%        | 9.3%          | 5.0%   | 2.3%    | 0.9%    | 1.1%            |
| Registration/Admissions /Discharge/Transfer                                | 55.0%        | 13.3%         | 7.8%   | 3.0%    | 0.9%    | 1.6%            |
| Claims processing                                                          | 52.3%        | 9.4%          | 5.3%   | 1.8%    | 0.9%    | 1.4%            |
| Master patient index for a single system or site of care                   | 47.0%        | 9.9%          | 1.4%   | 0.5%    | 3.0%    | 5.0%            |
| Charge capture and/or coding                                               | 46.8%        | 15.0%         | 10.1%  | 2.8%    | 0.7%    | 1.4%            |
| Patient eligibility                                                        | 39.0%        | 18.2%         | 12.4%  | 2.8%    | 1.4%    | 1.6%            |
| Master person index or enterprise directory to support multiple facilities | 35.1%        | 15.1%         | 7.3%   | 5.5%    | 1.4%    | 0.9%            |

### B. EHR Data Capture, Review, and Update Capabilities

|                                                              | In Use Today | Total Planned | 1 year | 2 years | 3 years | 4 or more years |
|--------------------------------------------------------------|--------------|---------------|--------|---------|---------|-----------------|
| Demographics                                                 | 59.2%        | 11.0%         | 6.4%   | 2.3%    | 0.5%    | 1.8%            |
| Laboratory results                                           | 50.2%        | 16.6%         | 11.5%  | 3.7%    | 0.5%    | 0.9%            |
| Allergies                                                    | 47.5%        | 21.1%         | 15.6%  | 3.4%    | 1.4%    | 0.7%            |
| Medications being taken                                      | 44.7%        | 24.2%         | 18.3%  | 3.9%    | 1.1%    | 0.9%            |
| Radiology results                                            | 43.3%        | 19.5%         | 12.2%  | 5.3%    | 0.9%    | 1.1%            |
| Vital statistics                                             | 40.8%        | 25.1%         | 17.7%  | 5.5%    | 0.5%    | 1.4%            |
| Past medical history                                         | 39.4%        | 26.5%         | 19.0%  | 4.8%    | 1.6%    | 1.1%            |
| Discharge summary                                            | 38.8%        | 17.7%         | 13.1%  | 2.8%    | 1.1%    | 0.7%            |
| Progress Notes                                               | 35.3%        | 29.0%         | 18.6%  | 6.0%    | 2.3%    | 2.1%            |
| Operative notes                                              | 35.3%        | 17.0%         | 11.9%  | 2.8%    | 1.4%    | 0.9%            |
| On-site patient intake/history & physical                    | 34.4%        | 29.1%         | 18.3%  | 6.9%    | 2.5%    | 1.4%            |
| Problem lists                                                | 31.7%        | 29.6%         | 19.7%  | 6.2%    | 2.1%    | 1.6%            |
| Referrals or consults                                        | 31.0%        | 28.1%         | 18.3%  | 8.0%    | 0.7%    | 1.1%            |
| Alerts, warnings, or reminders generated by decision support | 28.7%        | 31.2%         | 18.1%  | 8.3%    | 1.8%    | 3.0%            |
| OT/PT/RT notes                                               | 26.4%        | 25.6%         | 15.4%  | 6.7%    | 2.1%    | 1.4%            |
| Post-visit patient education                                 | 25.5%        | 29.1%         | 16.3%  | 7.1%    | 3.2%    | 2.5%            |
| Pre-visit health screenings, evaluations, or assessments     | 22.7%        | 34.0%         | 22.5%  | 6.7%    | 3.4%    | 1.4%            |
| Problem knowledge couplers                                   | 13.8%        | 31.0%         | 15.8%  | 9.2%    | 2.8%    | 3.2%            |

### C. EHR Access to Remote Locations by Clinicians

|                                | In Use Today | Total Planned | 1 year | 2 years | 3 years | 4 or more years |
|--------------------------------|--------------|---------------|--------|---------|---------|-----------------|
| EHR Access to Remote Locations | 36.7%        | 20.0%         | 12.4%  | 4.6%    | 1.6%    | 1.4%            |

### D. Order Entry Applications and Functions

| Nurse or staff order entry                                                                               | In Use Today | Total Planned | 1 year | 2 years | 3 years | 4 or more years |
|----------------------------------------------------------------------------------------------------------|--------------|---------------|--------|---------|---------|-----------------|
| Laboratory                                                                                               | 36.0%        | 20.2%         | 13.8%  | 4.6%    | 1.1%    | 0.7%            |
| Radiology                                                                                                | 30.0%        | 22.5%         | 14.7%  | 5.7%    | 1.6%    | 0.5%            |
| Pharmacy                                                                                                 | 29.6%        | 21.6%         | 15.6%  | 3.7%    | 1.8%    | 0.5%            |
| Other                                                                                                    | 5.3%         | 2.1%          | 0.9%   | 0.5%    | 0.5%    | 0.2%            |
| Physician order entry without clinical decision support                                                  | In Use Today | Total Planned | 1 year | 2 years | 3 years | 4 or more years |
| Laboratory                                                                                               | 21.6%        | 20.2%         | 11.9%  | 6.9%    | 0.9%    | 0.5%            |
| Radiology                                                                                                | 18.3%        | 21.8%         | 12.4%  | 7.8%    | 1.1%    | 0.5%            |
| Pharmacy                                                                                                 | 16.7%        | 19.9%         | 13.5%  | 4.8%    | 0.9%    | 0.7%            |
| Other                                                                                                    | 3.7%         | 3.1%          | 1.8%   | 0.9%    | 0.2%    | 0.2%            |
| Physician order entry with clinical decision support (i.e., alerts, warnings, reminders, or guidelines): | In Use Today | Total Planned | 1 year | 2 years | 3 years | 4 or more years |
| Laboratory                                                                                               | 13.5%        | 30.1%         | 15.6%  | 10.3%   | 2.1%    | 2.1%            |
| Radiology                                                                                                | 10.6%        | 32.3%         | 16.7%  | 9.9%    | 3.9%    | 1.8%            |
| Pharmacy                                                                                                 | 17.2%        | 27.7%         | 15.8%  | 8.0%    | 2.5%    | 1.4%            |
| Other                                                                                                    | 2.1%         | 7.3%          | 3.4%   | 2.1%    | 1.1%    | 0.7%            |

### E. E-Prescribing to Commercial/Retail Pharmacies

|                                                                    | In Use Today | Total Planned | 1 year | 2 years | 3 years | 4 or more years |
|--------------------------------------------------------------------|--------------|---------------|--------|---------|---------|-----------------|
| Access to drug reference information                               | 26.1%        | 20.8%         | 14.7%  | 3.4%    | 1.6%    | 1.1%            |
| Medication history review                                          | 24.8%        | 22.2%         | 14.7%  | 4.6%    | 1.8%    | 1.1%            |
| Drug allergy checking                                              | 24.5%        | 23.2%         | 15.1%  | 5.3%    | 1.4%    | 1.4%            |
| Drug-drug interactions                                             | 23.6%        | 23.1%         | 15.6%  | 5.0%    | 1.4%    | 1.1%            |
| Prescription renewal                                               | 19.3%        | 28.7%         | 17.7%  | 6.4%    | 2.8%    | 1.8%            |
| New prescriptions                                                  | 17.9%        | 29.6%         | 18.6%  | 6.7%    | 2.5%    | 1.8%            |
| Patient eligibility verification                                   | 16.5%        | 28.6%         | 18.3%  | 6.4%    | 1.8%    | 2.1%            |
| Refill tracking                                                    | 14.4%        | 27.5%         | 17.2%  | 6.2%    | 2.3%    | 1.8%            |
| Patient eligibility for specific drug within health plan formulary | 8.3%         | 31.3%         | 19.5%  | 6.7%    | 2.1%    | 3.0%            |

### F. Use of Continuity of Care Record (CCR)

|                                          | In Use Today | Total Planned | 1 year | 2 years | 3 years | 4 or more years |
|------------------------------------------|--------------|---------------|--------|---------|---------|-----------------|
| Referral to another practitioner         | 14.0%        | 28.0%         | 13.8%  | 8.7%    | 3.7%    | 1.8%            |
| Transfer to another care setting         | 11.7%        | 26.6%         | 12.4%  | 8.3%    | 4.1%    | 1.8%            |
| Discharge without a referral or transfer | 12.2%        | 20.6%         | 9.6%   | 6.2%    | 3.2%    | 1.6%            |
| Personal health record                   | 7.3%         | 28.5%         | 10.8%  | 8.5%    | 5.5%    | 3.7%            |
| Other                                    | 2.3%         | 3.0%          | 1.1%   | 0.9%    | 0.5%    | 0.5%            |

### G. Access to Reference Information

|                                       | In Use Today | Total Planned | 1 year | 2 years | 3 years | 4 or more years |
|---------------------------------------|--------------|---------------|--------|---------|---------|-----------------|
| Drug reference information            | 38.5%        | 19.7%         | 14.0%  | 3.0%    | 1.6%    | 1.1%            |
| Drug formularies                      | 31.9%        | 21.9%         | 16.7%  | 3.2%    | 1.1%    | 0.9%            |
| Clinical guidelines and protocols     | 31.7%        | 24.3%         | 13.3%  | 7.1%    | 2.5%    | 1.4%            |
| Administrative policies and practices | 29.4%        | 19.9%         | 11.2%  | 5.5%    | 1.6%    | 1.6%            |

### H. Email

|                                    | In Use Today | Total Planned | 1 year | 2 years | 3 years | 4 or more years |
|------------------------------------|--------------|---------------|--------|---------|---------|-----------------|
| Between practitioners              | 48.9%        | 13.2%         | 8.5%   | 2.8%    | 0.5%    | 1.4%            |
| Between patients and practitioners | 20.2%        | 27.1%         | 11.5%  | 10.3%   | 3.2%    | 2.1%            |

### I. Clinical Data Repositories

|                                                                                   | In Use Today | Total Planned | 1 year | 2 years | 3 years | 4 or more years |
|-----------------------------------------------------------------------------------|--------------|---------------|--------|---------|---------|-----------------|
| Supporting storage of EHR data, text, and reimbursement codes (ICD and CPT codes) | 42.2%        | 14.9%         | 8.9%   | 2.8%    | 2.1%    | 1.1%            |
| Also supports storage of clinical codes (LOINC, MEDCIN, SNOMED, etc.)             | 21.1%        | 25.0%         | 13.3%  | 7.1%    | 2.8%    | 1.8%            |
| Also supports storage of voice or sound                                           | 11.0%        | 27.0%         | 11.9%  | 7.8%    | 3.4%    | 3.9%            |
| Also supports storage of clinical images                                          | 25.5%        | 29.0%         | 16.5%  | 8.0%    | 3.4%    | 1.1%            |

### J. Medical Records Document Imaging Systems

|                                          | In Use Today | Total Planned | 1 year | 2 years | 3 years | 4 or more years |
|------------------------------------------|--------------|---------------|--------|---------|---------|-----------------|
| Interim to a clinical data repository    | 16.7%        | 17.7%         | 11.2%  | 3.0%    | 2.8%    | 0.7%            |
| Supplement to a clinical data repository | 19.5%        | 20.1%         | 11.0%  | 4.8%    | 3.4%    | 0.9%            |

**K. A Data Warehouse or Secondary Database of Patient Information to Support Retrospective Analysis of Outcomes, Utilization, and Clinical Processes**

|                                                                  | <b>In Use Today</b> | <b>Total Planned</b> | <b>1 year</b> | <b>2 years</b> | <b>3 years</b> | <b>4 or more years</b> |
|------------------------------------------------------------------|---------------------|----------------------|---------------|----------------|----------------|------------------------|
| A data warehouse or secondary database of patient information... | 21.8%               | 21.5%                | 11.9%         | 5.7%           | 2.5%           | 1.4%                   |

**L. Clinical Trial Applications**

|                             | <b>In Use Today</b> | <b>Total Planned</b> | <b>1 year</b> | <b>2 years</b> | <b>3 years</b> | <b>4 or more years</b> |
|-----------------------------|---------------------|----------------------|---------------|----------------|----------------|------------------------|
| Clinical Trial Applications | 8.5%                | 17.7%                | 6.2%          | 5.3%           | 3.9%           | 2.3%                   |

## 11. What are the major barriers to your plans for implementing an EHR System?

### Preface:

- When comparing the results from 2004 to the previous two years, take into consideration the shift in demographics (increase in Ambulatory respondents) and the margin of error.
- The percentages will add to more than 100% because the respondents were asked to select all that apply.

| <b>Barriers</b>                                                                            | <b>2002</b> | <b>2003</b> | <b>2004</b> |
|--------------------------------------------------------------------------------------------|-------------|-------------|-------------|
| Lack of adequate funding or resources                                                      | 58.5%       | 64.2%       | 55.5%       |
| Inability to find an EHR solution or components at an affordable cost                      | 31.7%       | 32.3%       | 36.0%       |
| Lack of support by medical staff                                                           | 35.4%       | 37.2%       | 35.4%       |
| Difficulty in finding an EHR solution that is not fragmented among vendors or IT platforms | 28.7%       | 30.2%       | 34.1%       |
| Difficulty in creating a migration plan from paper to electronic health records            | 31.2%       | 29.2%       | 27.6%       |
| Unable to find an EHR solution that meets our application or technical requirements        | 22.9%       | 27.3%       | 27.3%       |
| Inadequate or incomplete healthcare information standards or code sets                     | 25.2%       | 22.9%       | 27.3%       |
| Difficulty in building a strong business case (ROI)                                        | 20.1%       | 21.9%       | 24.7%       |
| Difficulty in evaluating EHR solutions or components                                       | 24.9%       | 17.2%       | 23.1%       |
| Lack of structured medical terminologies                                                   | 12.4%       | 18.1%       | 16.9%       |
| Other                                                                                      | 7.8%        | 8.0%        | 11.0%       |
| Total Respondents                                                                          | 477         | 576         | 308         |
| Margin of Error                                                                            | +/- 4.6%    | +/- 4.2%    | +/- 5.6%    |

## 12. What priority would you give to the following reasons for implementing mobile health/wireless solutions within your organization?

### Preface:

- Percentages are based on the total respondents for Question 12 (326).
- Margin of error for Question 12 is +/- 5.4%.

| <b>Priorities</b>                                                               | <b>High</b> | <b>Medium</b> | <b>Low</b> |
|---------------------------------------------------------------------------------|-------------|---------------|------------|
| Strengthens the ability to retain and recruit practitioners                     | 42.3%       | 42.0%         | 13.2%      |
| Enhances the public image of the organization as being technologically advanced | 31.3%       | 47.2%         | 19.9%      |
| Improves patient safety                                                         | 19.3%       | 25.8%         | 52.1%      |
| Supports the organizations strategy to expand the use of information technology | 13.5%       | 42.9%         | 41.4%      |
| Enhances clinical workflow and/or efficiency                                    | 6.7%        | 24.5%         | 68.7%      |

### 13. If you are using mobile/wireless devices for healthcare applications, which ones are they?

**Preface:**

- The total number of respondents to Question 13 is 252.
- Percentages are based on the total respondents for the survey (436) to facilitate comparison with the results from the previous year.
- When comparing the results from 2003 to 2004, take into consideration the shift in demographics (increase in Ambulatory respondents) and the margin of error.
- The percentages will add to more than 100% because the respondents were asked to select all that apply.

| <b>Mobile/Wireless Devices</b>   | <b>2003</b> | <b>2004</b> |
|----------------------------------|-------------|-------------|
| Laptop/notebook Computer         | 46.9%       | 41.3%       |
| Personal Digital Assistant (PDA) | 36.5%       | 29.8%       |
| Tablet PC                        | 20.4%       | 25.5%       |
| Cell Phone                       | 16.7%       | 22.0%       |
| Other                            | 3.3%        | 1.6%        |
| Total Respondents                | 759         | 436         |
| Margin of Error                  | +/- 3.6%    | +/- 4.7%    |

## 14. What mobile healthcare applications do you use or plan to implement in your facility within the next four years?

### Preface:

- Percentages are based on the total respondents for the survey (436).
- Margin of error for all portions of Question 14 is +/- 4.7%.
- The percentages may add to more than 100% because the respondents were asked to select all that apply.

### A. Administrative/Financial Management

|                                   | In Use Today | Total Planned | 1 year | 2 years | 3 years | 4 or more years |
|-----------------------------------|--------------|---------------|--------|---------|---------|-----------------|
| Scheduling                        | 23.2%        | 19.0%         | 10.3%  | 5.5%    | 2.1%    | 1.1%            |
| Charge Capture                    | 19.7%        | 25.7%         | 14.9%  | 6.4%    | 3.4%    | 0.9%            |
| E-Signature                       | 15.6%        | 31.0%         | 18.8%  | 7.8%    | 3.0%    | 1.4%            |
| Asset Tracking (Bar coding, RFID) | 8.0%         | 27.3%         | 11.5%  | 10.8%   | 3.0%    | 2.1%            |
| Location access (geo-fencing)     | 5.0%         | 16.5%         | 7.3%   | 4.6%    | 2.5%    | 2.1%            |

### B. Access To Reference Information

|                                   | In Use Today | Total Planned | 1 year | 2 years | 3 years | 4 or more years |
|-----------------------------------|--------------|---------------|--------|---------|---------|-----------------|
| Drug-to-drug interactions         | 23.2%        | 30.5%         | 19.5%  | 7.1%    | 3.4%    | 0.5%            |
| Database access                   | 21.1%        | 28.0%         | 17.7%  | 7.1%    | 2.8%    | 0.5%            |
| Clinical guidelines and protocols | 20.2%        | 31.2%         | 17.4%  | 9.4%    | 3.7%    | 0.7%            |
| Alerts, warnings, reminders       | 19.3%        | 33.3%         | 19.7%  | 8.9%    | 3.9%    | 0.7%            |
| Formularies                       | 18.1%        | 33.5%         | 21.8%  | 7.8%    | 3.4%    | 0.5%            |
| Internet web access               | 3.0%         | 20.2%         | 11.7%  | 5.0%    | 3.2%    | 0.2%            |

### C. Access To Patient Data

|                            | In Use Today | Total Planned | 1 year | 2 years | 3 years | 4 or more years |
|----------------------------|--------------|---------------|--------|---------|---------|-----------------|
| Patient record             | 30.7%        | 26.4%         | 17.2%  | 6.0%    | 2.5%    | 0.7%            |
| Lab and other test results | 29.8%        | 26.1%         | 17.7%  | 6.0%    | 1.8%    | 0.7%            |
| PACS access                | 12.8%        | 22.2%         | 11.2%  | 6.4%    | 2.1%    | 2.5%            |
| Still image access         | 12.2%        | 25.0%         | 14.0%  | 6.9%    | 2.3%    | 1.8%            |
| WWAN Cardiac telemetry     | 4.1%         | 14.4%         | 3.9%   | 4.6%    | 3.0%    | 3.0%            |
| Remote ICU monitoring      | 3.2%         | 22.5%         | 7.8%   | 6.9%    | 4.4%    | 3.4%            |

### D. Capture of Patient Care Documentation

|                                     | In Use Today | Total Planned | 1 year | 2 years | 3 years | 4 or more years |
|-------------------------------------|--------------|---------------|--------|---------|---------|-----------------|
| Dictation capture                   | 21.3%        | 19.3%         | 13.1%  | 3.4%    | 2.3%    | 0.5%            |
| Electronic data capture             | 21.3%        | 25.2%         | 16.3%  | 5.5%    | 2.8%    | 0.7%            |
| Order entry                         | 18.6%        | 29.4%         | 19.5%  | 6.4%    | 2.8%    | 0.7%            |
| Nursing data capture (vitals, I/Os) | 17.9%        | 28.0%         | 17.0%  | 6.9%    | 3.4%    | 0.7%            |

**E. Medications**

|                                                    | <b>In Use Today</b> | <b>Total Planned</b> | <b>1 year</b> | <b>2 years</b> | <b>3 years</b> | <b>4 or more years</b> |
|----------------------------------------------------|---------------------|----------------------|---------------|----------------|----------------|------------------------|
| E-prescribing                                      | 11.5%               | 37.2%                | 22.7%         | 9.2%           | 4.4%           | 0.9%                   |
| Medication management (i.e. bar-coding at bedside) | 4.1%                | 31.0%                | 13.5%         | 12.6%          | 3.2%           | 1.6%                   |

**F. Communication**

|                                   | <b>In Use Today</b> | <b>Total Planned</b> | <b>1 year</b> | <b>2 years</b> | <b>3 years</b> | <b>4 or more years</b> |
|-----------------------------------|---------------------|----------------------|---------------|----------------|----------------|------------------------|
| Email                             | 30.7%               | 14.7%                | 9.6%          | 3.0%           | 1.6%           | 0.5%                   |
| Nursing/staff voice communication | 11.0%               | 17.2%                | 9.2%          | 4.8%           | 1.8%           | 1.4%                   |
| Videoconferencing                 | 11.0%               | 14.0%                | 4.6%          | 4.4%           | 2.8%           | 2.3%                   |
| Document transfer                 | 8.9%                | 19.7%                | 10.6%         | 4.8%           | 2.5%           | 1.8%                   |
| Push-to-talk voice communication  | 8.5%                | 16.1%                | 6.7%          | 4.6%           | 2.5%           | 2.3%                   |
| Video capture and transmission    | 4.1%                | 17.7%                | 5.5%          | 5.7%           | 3.2%           | 3.2%                   |
| Other                             | 0.2%                | 0.9%                 | 0.7%          | 0.2%           | 0.0%           | 0.0%                   |

## 15. What wireless connectivity technology are you using?

### Preface:

- Percentages are based on the total respondents for the survey (436).
- Margin of error for all portions of Question 15 is +/- 4.7%.
- The percentages may add to more than 100% because the respondents were asked to select all that apply.

| <b>Wireless Connectivity Technology</b>                                             | <b>In Use Today</b> |
|-------------------------------------------------------------------------------------|---------------------|
| WiFi (wireless local area networks)                                                 | 32.1%               |
| Digital cellular service                                                            | 13.3%               |
| WPAN (wireless personal area networks):<br><i>for example</i> - Infrared, Bluetooth | 6.4%                |
| Analog cellular service                                                             | 3.0%                |
| Not sure                                                                            | 10.8%               |
| None                                                                                | 19.0%               |

## 16. What do you consider to be the major concerns/problems related to implementation of mobile/wireless healthcare devices and applications?

### Preface:

- When comparing the results from 2004 with the previous two years, take into consideration the shift in demographics (increase in Ambulatory respondents) and the margin of error.
- The percentages may add to more than 100% because the respondents were asked to select all that apply.

| <b>Major Concerns/Problems</b>                                                          | <b>2002</b> | <b>2003</b> | <b>2004</b> |
|-----------------------------------------------------------------------------------------|-------------|-------------|-------------|
| Lack of security of confidential information when sending/receiving                     | 52.1%       | 51.2%       | 47.6%       |
| Concern about unauthorized use of mobile/wireless devices that have been lost or stolen | 39.5%       | 44.6%       | 42.8%       |
| Inconsistent connectivity when roaming within the healthcare facility                   | n/a         | n/a         | 36.6%       |
| Slow data transfer rates to/from the host system                                        | 38.7%       | 35.4%       | 35.6%       |
| Lack of a strategy or implementation plan for adoption                                  | n/a         | n/a         | 29.5%       |
| Interference with medical devices                                                       | 20.8%       | 24.2%       | 27.1%       |
| Delays in data synchronization with host systems or applications                        | 38.7%       | 31.9%       | 26.4%       |
| Lack of interoperability with other devices or systems                                  | 34.6%       | 31.5%       | 24.0%       |
| Inability to achieve workflow integration                                               | n/a         | 28.0%       | 20.2%       |
| Difficult to use                                                                        | 31.2%       | 31.2%       | 13.7%       |
| Other                                                                                   | 10.0%       | 13.0%       | 7.5%        |
| Total Respondents                                                                       | 491         | 596         | 292         |
| Margin of Error                                                                         | +/- 4.5%    | +/- 4.1%    | +/-5.7%     |