

# **Interventions to Improve Medication Safety in Primary Care Practice**

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# Background: Medication Safety in the Ambulatory Environment

## *Description of Problem*

- Magnitude of medication related errors in ambulatory environment
- Implications

## *Strategies to Improve Medication Safety*

- *Improve immediate access to drug information/pharmaceutical decision support at the point of care when prescribing*
- *Standardize and automate prescription writing (CPOE) using practical technologies at the point of care*
- Use special procedures/protocols for the use of high-risk medications
- Make relevant patient information available at the point of patient care
- Improve patients' knowledge about their treatment

# Purpose

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- **Determine the impact of personal digital assistant use (PDAs) by prescribers on potential medication errors in primary care physician office-based practices. Measure the occurrence of potential preventable medication related errors.**

# Determinants of Medication Safety

## Structure and Process

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### *Practice Structure*

- **Medication safety environment**
- **Office and user technology readiness**
- **Access to drug information/pharmaceutical decision support**

### *Medication use process*

- **Prescribing, Dispensing, Administering, Monitoring**
- **Systems and Management Control**

1. Nadzam, Deborah M., Development of medication-use indicators by the Joint Commission on Accreditation of Healthcare Organizations. AJHP. 48:1925-1930, 1991; 2. Donabedian A. Chapter 3: the quality of care: how can it be assessed? Pp32-46, in Quality in Health Care – Theory, Application, and Evolution, Aspen Publishers, Inc. 1995.

# Assessment of Medication Safety Outcomes

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## *Primary Outcomes*

- Determine the impact of PDA use on potential medication errors in office practice
- Determine barriers and solutions to incorporating technologies in daily practice
- Improve medication prescribing by reducing potential errors.

## *Secondary Outcomes*

- Translate proven strategies into widespread practice and build capacity in the community to further reduce errors by:
  - *Describing the Practice Structure from the context of:*
    - Medication safety environment
    - Office and user technology readiness
    - Access to drug information/pharmaceutical decision support
  - *Describing the Medication use process from the context of*
    - Patient Safety - Prescribing, Dispensing, Administering, Monitoring
    - Patient Safety - Systems and Management Control

# Study Design

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## *Randomized Controlled Trial*

- **Inclusion Criteria – no prior use of PDA**
- **Willing to not use a PDA during study if randomized to control group**

## *Intervention Group (n = 40)*

- **PDA as drug information source during the prescribing process**
- **enter and print prescriptions from PDA to local printer**

## *Control group (n = 40)*

- **traditional prescribing practices throughout the study.**

# Study Design Considerations

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## *Impact of Field Research on Practice Site – Reduce Barriers to Site*

- **Minimize interference with office work**
- **Minimize/eliminate additional office work**
- **Sensitive to overhead costs of office**
- **Sensitive to impact on non-participants**

## *Benefits to Participants*

- **Receive training on PDA based drug information applications**
- **Learn if this is a desirable office-based technology for daily use**
- **Contribute to the knowledge about possible improvements in patient safety**
- **Learn how ‘technology ready’ both you and your office are**

# Site and Participant Description

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## *Site Characteristics*

- 31 primary care offices
- 2.5 practitioners/site; range = 1-7/site
- 30 urban; 1 rural<sup>a</sup>

## *Prescriber Characteristics*

- Mean age = 42 years
- Gender - 1/3 female both groups
- Type of Practitioner – family practice = 85%

<sup>a</sup> Metropolitan Statistical Area

# Selecting the Information Source

## Intra-rater Comparison of References – Medication Safety Evaluation

Rater	Micromedex Average Score	ePocrates Average Score	LexiDrugs Average Score	Significance
Rater 1	2.1	2.0	2.4	p=0.07
Rater 2	2.1	2.0	2.6	p<0.05
Rater 3	1.9	2.0	2.6	p<0.05

## Inter-rater Comparison of Each Reference – Medication Safety Evaluation

Reference	Rater 1	Rater 2	Rater 3	Significance
Micromedex	2.1	2.1	1.9	p=0.49
ePocrates	2.0	2.0	2.0	p=0.99
LexiDrugs	2.4	2.6	2.6	p=0.32

# Medication Safety Environment in Office

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- 154 item written survey was developed to assess the domain of medication safety in primary care office practice.
- Survey designed based upon existing published evidence from the scientific literature, and reports and standards from private and public organizations.
- Safety domains were identified by reviewing the areas of safety emphasis from the Institute of Medicine report “To Err is Human”, the Agency for Healthcare Quality Research patient safety agenda and portfolio, and the scientific literature.
- Survey items integrate structure, process and outcome quality concepts relevant to medication safety.

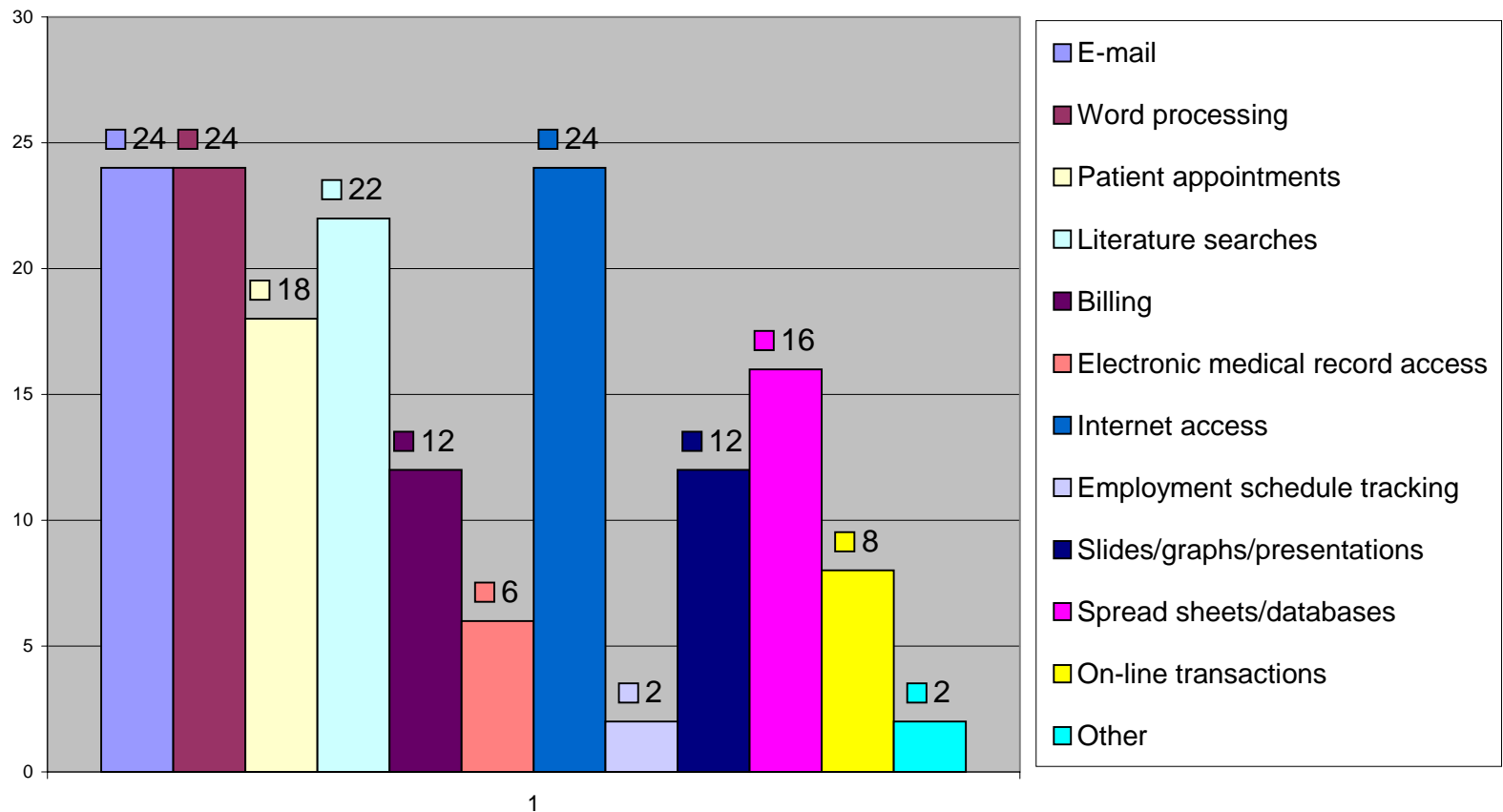
# Medication Safety Environment in Office

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- 44% - no procedure to respond to a serious medication error
- 56% - no procedure to giving prescription drug samples to patients to take home
- 6% - label samples for patients to assure proper use
- 36% - when telephone prescriptions in to pharmacist the pharmacist repeats back the order to minimize errors of verbal transmission
- 33% - update the patients chart when they renew orders by phone
- 24% - have dismissed individuals from employment because of error
- Indication for a medication is rarely included on the face of outpatient prescriptions written by primary care physicians in office based practice.

# Access to Information Sources

## What are the office computers used for?



# Access to Information Sources

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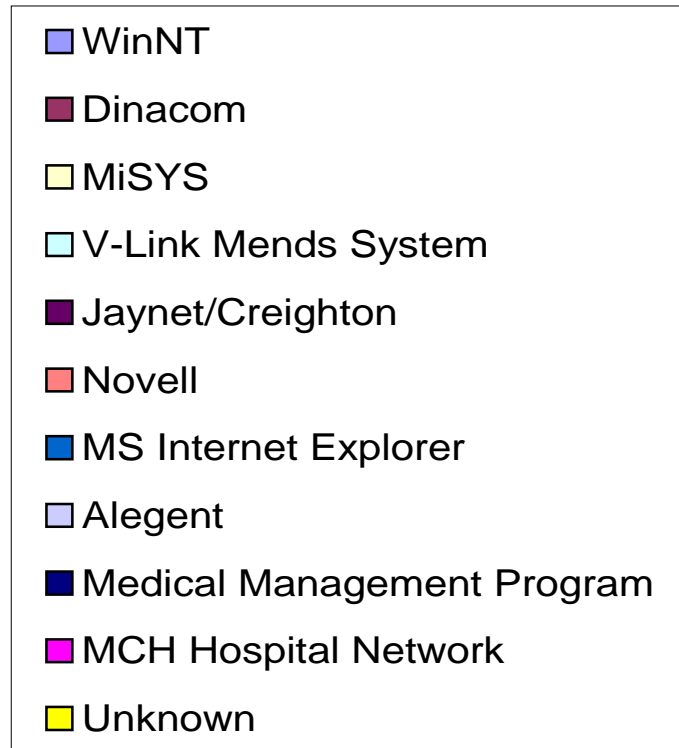
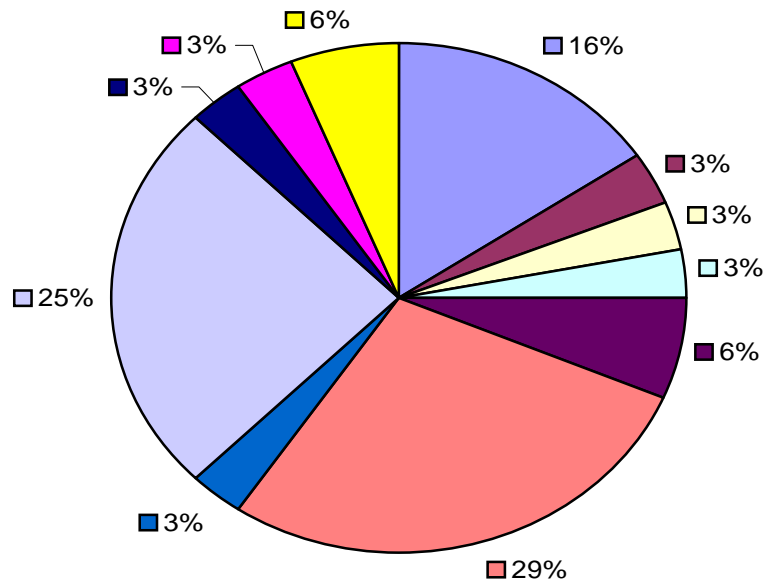
<b>Clinics in Region</b>	<b>“Top Ten” Drug Information Sources</b>
<b>28</b>	<b>Physicians Desk Reference – PDR</b>
<b>16</b>	<b>Sanford Guide to Antimicrobial Therapy</b>
<b>15</b>	<b>Harriet Lane Handbook</b>
<b>11</b>	<b>Monthly Prescribing Record (MPR)</b>
<b>10</b>	<b>The Red Book</b>
<b>10</b>	<b>The Washington Manual of Medical Therapeutic</b>
<b>8</b>	<b>The Medical Letter</b>
<b>7</b>	<b>Merck Index</b>
<b>5</b>	<b>Drugs in Pregnancy and Lactation</b>
<b>5</b>	<b>PDR Monthly</b>

# Office Technology Readiness

<i>Clinical Practice Computers</i>	% yes
Routine physician practice depends upon access to a computer	41
Personal computers are present in the patient examination rooms	0
Maintain electronic medical records	6
<i>Office Support Computers</i>	% yes
Office computers are networked	100
Office computers are networked to a printer	94
Printer is infrared enabled	6
Have a computer identified to serve as a hot sync source for a PDA	64

# Office Technology Readiness

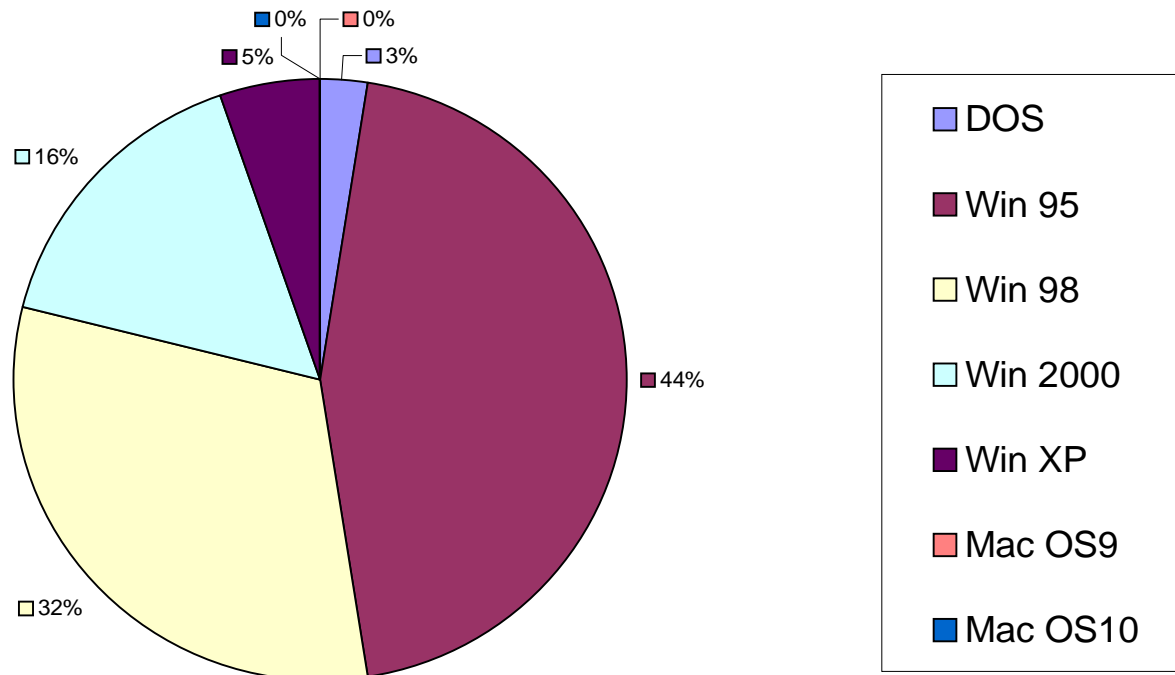
**If your office computers are networked, what type of network system is used?**



# Office Technology Readiness

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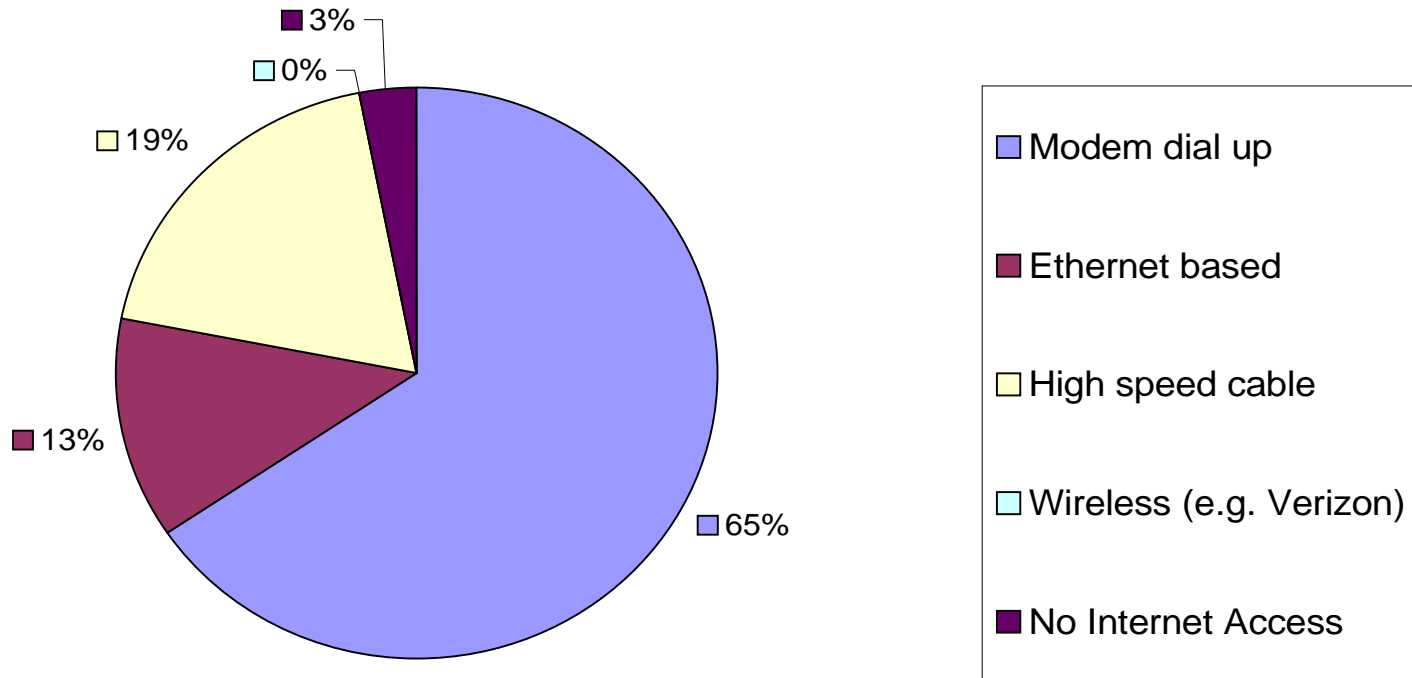
**What type of operating system is on the office computers?**



# Office Technology Readiness

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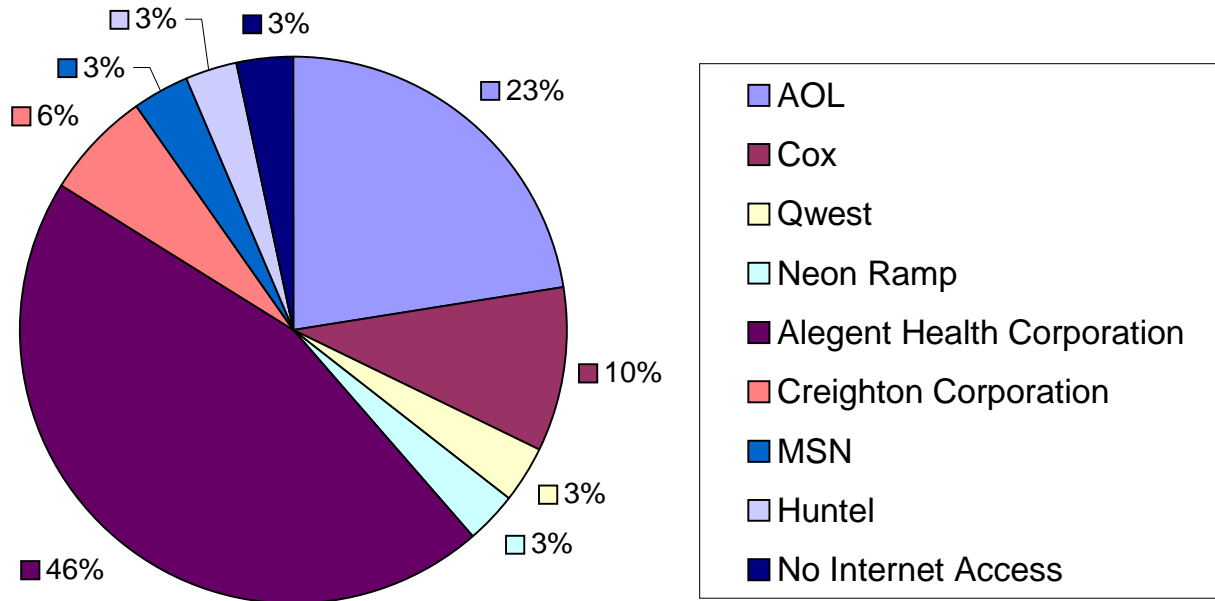
**What type of Internet access is available on the office computers?**



# Office Technology Readiness

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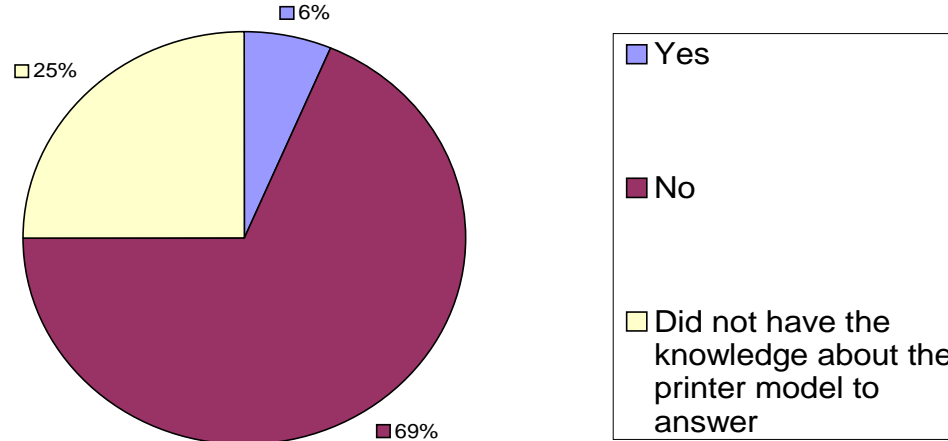
## What type of Internet Service Provider is used?



# Office Technology Readiness

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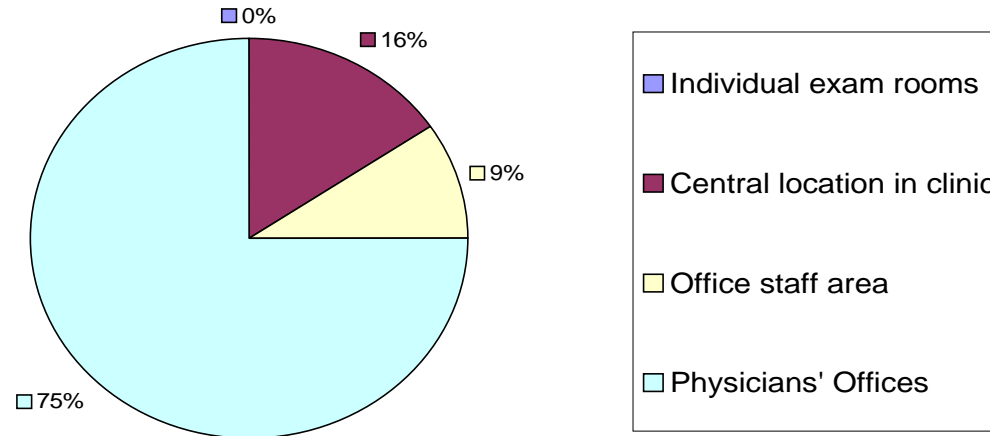
**Is the printer infrared enabled?**



# Office Technology Readiness

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**Where are these located?**



# Recommendations

- **Medication safety in office practice not developed as a concept.**
  - ***Recommendation:* Safety framework for primary care office is needed**
- **Technology readiness farther behind than expected after site assessment.**
  - ***Recommendation:* Strategic plan for technology assessment and integration is critical for future development of primary care offices.**

# Recommendations

- **Drug Information Resources are not accessible at the point of care in printed form**
  - ***Recommendation:* Consider a move to PDA based drug information sources as an early adoption.**