

# Defining The State of Emergency Care Research

Robert W. Neumar MD, PhD

Chair, Research Committee

American College of Emergency Physicians



Future of Emergency Care Series

# **Hospital-Based Emergency Care**

At the Breaking Point

Committee on the Future of Emergency Care in the  
United States Health System

**INSTITUTE OF MEDICINE**

*OF THE NATIONAL ACADEMIES*

2006

**Advising the Nation. Improving Health.**

# Recommendations

**8.2:** The Secretary of the Department of Health and Human Services (DHHS) should conduct a study to examine the gaps and opportunities in emergency and trauma care research, and recommend a strategy for the optimal organization and funding of the research effort.

**8.2a:** This study should include consideration of training of new investigators, development of multi-center research networks, funding of *Clinical Translational Science Centers (CTSCs)* that specifically include an emergency and trauma care component, involvement of emergency and trauma care researchers in the grant review and research advisory processes, and improved research coordination through a dedicated center or institute.

**8.2b:** Congress and federal agencies involved in emergency and trauma care research (including the Department of Transportation, the Department of Health and Human Services, the Department of Homeland Security, and Department of Defense) should implement the study's recommendations.

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## Testimony

Statement by

**Walter J. Koroshetz, M.D.,  
Deputy Director**

**National Institutes of Neurological Disorders and Stroke  
National Institutes of Health  
U.S. Department of Health and Human Services**

on

**NIH Emergency Care Research**

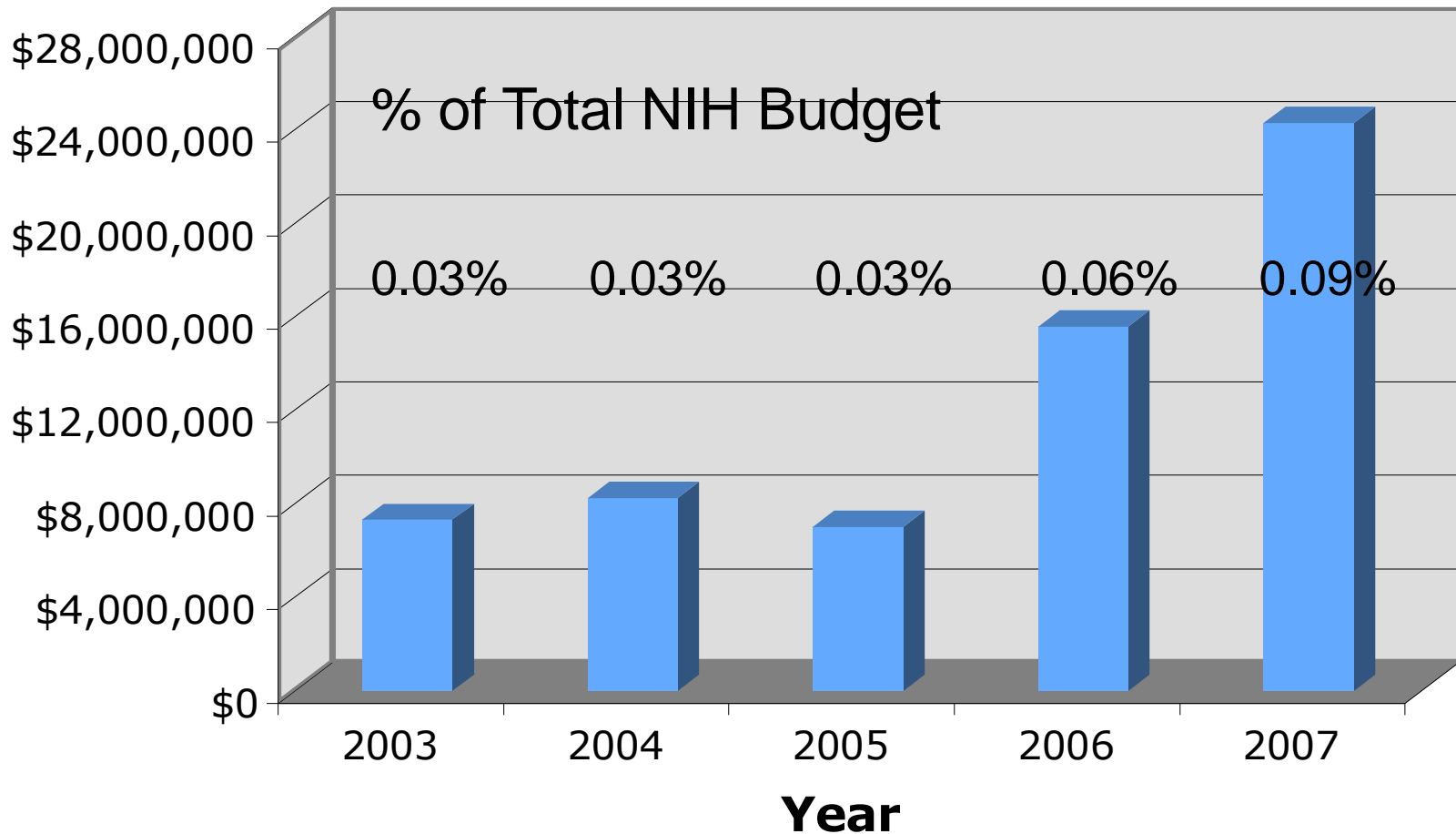
before

**Committee on Oversight and Government Reform  
U.S. House of Representatives**

**Friday, June 22, 2007**

*To understand the scope and nature of NIH supported research and training that underpin emergency care, the NIH is conducting a targeted internal review of its current research portfolio as it relates to the key scientific questions that need to be addressed to improve emergency medical care. This will include research in pediatric emergency care, pre-hospital acute care, and research training opportunities.*

# Annual NIH Funding for Departments of Emergency Medicine



QuickTime™ and a  
TIFF (LZW) decompressor  
are needed to see this picture.

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# Defining The State of Emergency Care Research

- Patients
- Presentations and Diseases
- Places
- Practitioners
- Timing
- Summary



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## Ambulatory Medical Care Utilization Estimates for 2005

by Catharine W. Burt, Ed.D.; Linda F. McCaig, M.P.H.; and  
Elizabeth A. Rechtsteiner, M.S., Division of Health Care Statistics

### Abstract

*Objective*—This report presents statistics on ambulatory care visits to physician offices, hospital outpatient departments (OPDs), and hospital emergency departments (EDs) in the United States in 2005. Ambulatory medical care utilization is described in terms of patient, practice, facility, and visit characteristics.

*Methods*—Data from the 2005 National Ambulatory Medical Care Survey (NAMCS) and the National Hospital Ambulatory Medical Care Survey (NHAMCS) were combined to produce averaged annual estimates of ambulatory medical care utilization.

*Results*—Patients in the United States made an estimated 1.2 billion visits to physician offices and hospital OPDs and EDs, a rate of 4.0 visits per person annually. Between 1995 and 2005, population visit rates increased by about 20% in primary care offices, surgical care offices, and OPDs; 37% in medical specialty offices; and 7% in EDs. The aging of the population has contributed to increased volume of visits because older patients have higher visit rates. Visits by patients 40–59 years of age represented about 28.5 percent in 2005, compared with 23.9 percent in 1995. Black persons had higher visit rates than white persons to hospital OPDs and EDs, but lower visit rates to office-based primary care and to

### Introduction

This report presents summary information on the utilization of ambulatory medical care across physician offices and hospital emergency and outpatient departments. Physician offices are further classified by the physician specialty: primary care, surgical, and medical. The tables present total visits across all settings as well as percent distributions by setting type. Data are from NAMCS and NHAMCS, which are part of the ambulatory care component of the National Health Care Survey, a family of provider-based surveys conducted by the Centers for Disease Control and Prevention's National Center for Health Statistics.

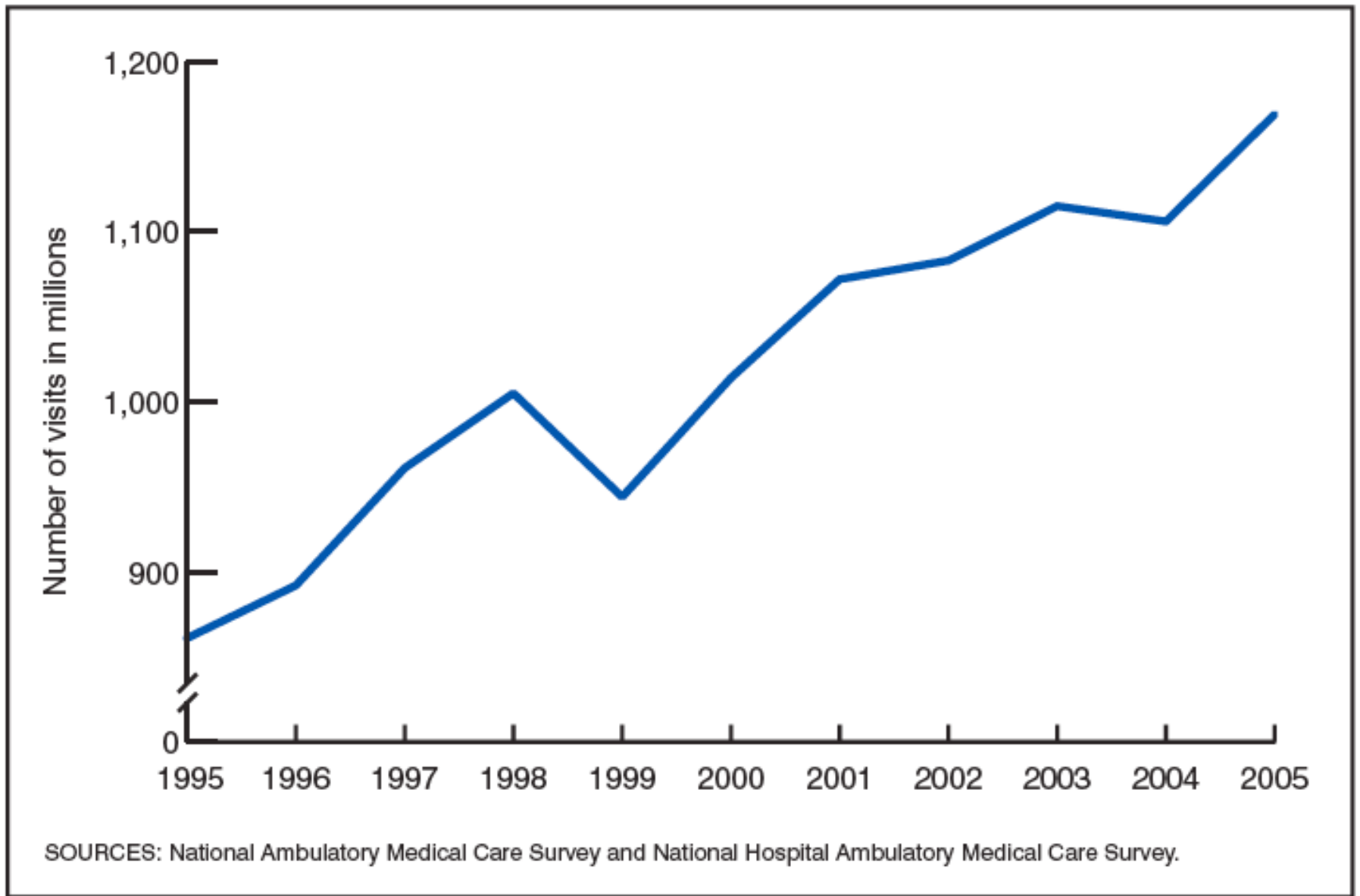
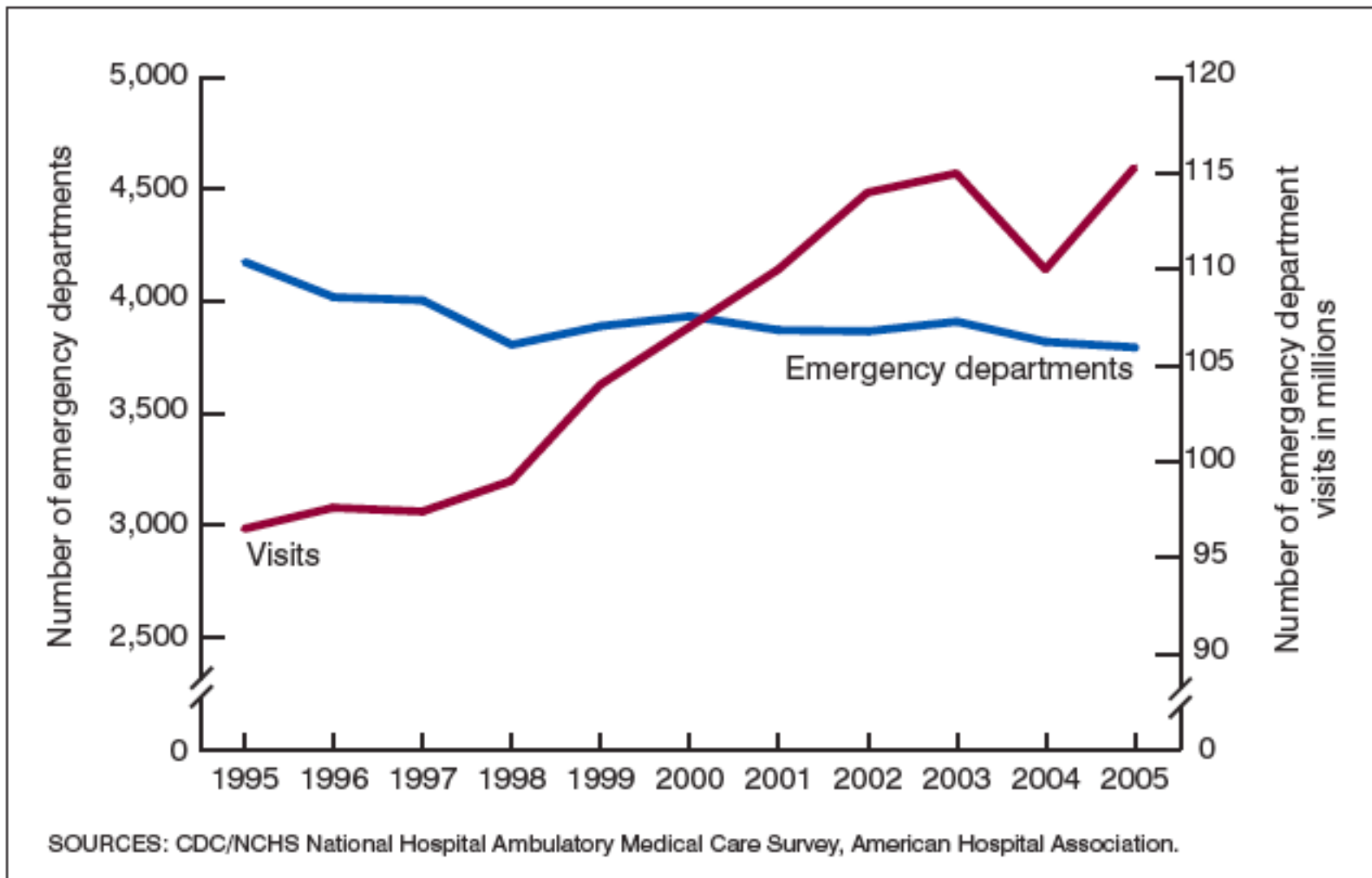


Figure 1. Trends in ambulatory care visits: United States, 1995–2005



**Figure 1. Trends in numbers of emergency departments and related visits: United States, 1995–2005**

# Number and Distribution of Ambulatory Care Vists 2005

(Numbers in Millions)

|                   | <b>All</b> | <b>ED</b> | <b>ED %</b> |
|-------------------|------------|-----------|-------------|
| <b>All visits</b> | 1,169,333  | 115,323   | 10%         |

## Number and Distribution of Ambulatory Care Vists 200!

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- Timing
- Summary



## National Hospital Ambulatory Medical Care Survey: 2005 Emergency Department Summary

by Eric W. Nawar, M.H.S.; Richard W. Niska, M.D., F.A.C.E.P.;  
and Jianmin Xu, M.S., Division of Health Care Statistics

### Abstract

*Objective*—This report presents the most current (2005) nationally representative data on visits to hospital emergency departments (ED) in the United States. Statistics are presented on selected hospital, patient, and visit characteristics. Selected trends in ED utilization from 1995 through 2005 are also presented.

*Methods*—Data are from the 2005 National Hospital Ambulatory Medical Care Survey (NHAMCS), the longest continuously running nationally representative survey of hospital ED and outpatient department (OPD) utilization. The NHAMCS collects data on visits to emergency and outpatient departments of nonfederal, short-stay, and general hospitals in the United States. Sample data are weighted to produce annual national estimates.

*Results*—During 2005, an estimated 115.3 million visits were made to hospital EDs, about 39.6 visits per 100 persons. This represents on average roughly 30,000 visits per ED in 2005, a 31 percent increase over 1995 (23,000). Visit rates have shown an increasing trend since 1995 for persons 22–49 years of age, 50–64 years

### Introduction

The National Hospital Ambulatory Medical Care Survey (NHAMCS) was inaugurated in 1992 to gather, analyze, and disseminate information about the health care provided by hospital EDs and OPDs. NHAMCS is part of the ambulatory component of the National Health Care Survey, a family of surveys that measures health care utilization across various types of providers. More information about the National Health Care Survey can be found at the National Center for Health Statistics (NCHS) website: [www.cdc.gov/nchs](http://www.cdc.gov/nchs).

Table 9. Emergency department visits principal reasons for visit: United States, 2005

| Principal reason for visit                                      | Number of visits in thousands | Percent distribution |
|-----------------------------------------------------------------|-------------------------------|----------------------|
| All visits . . . . .                                            | 115,323                       | 100.0                |
| Stomach and abdominal pain, cramps, and spasms . . . . .        | 7,833                         | 6.8                  |
| Chest pain and related symptoms . . . . .                       | 5,812                         | 5.0                  |
| Fever . . . . .                                                 | 5,042                         | 4.4                  |
| Cough . . . . .                                                 | 3,359                         | 2.9                  |
| Headache, pain in head . . . . .                                | 3,104                         | 2.7                  |
| Back symptoms . . . . .                                         | 2,918                         | 2.5                  |
| Shortness of breath . . . . .                                   | 2,802                         | 2.4                  |
| Pain, site not referable to a specific body system . . . . .    | 2,554                         | 2.2                  |
| Vomiting . . . . .                                              | 2,535                         | 2.2                  |
| Symptoms referable to throat . . . . .                          | 2,178                         | 1.9                  |
| Lacerations and cuts - upper extremity . . . . .                | 1,843                         | 1.6                  |
| Accident, not otherwise specified . . . . .                     | 1,808                         | 1.6                  |
| Earache or ear infection . . . . .                              | 1,707                         | 1.5                  |
| Leg symptoms . . . . .                                          | 1,568                         | 1.4                  |
| Skin rash . . . . .                                             | 1,548                         | 1.3                  |
| Injury, other and unspecified type—head, neck, and face . . . . | 1,538                         | 1.3                  |
| Labored or difficult breathing (dyspnea) . . . . .              | 1,530                         | 1.3                  |
| Nausea . . . . .                                                | 1,525                         | 1.3                  |
| Vertigo-dizziness . . . . .                                     | 1,524                         | 1.3                  |
| Motor vehicle accident, type of injury unspecified . . . . .    | 1,494                         | 1.3                  |
| All other reasons . . . . .                                     | 61,101                        | 53.0                 |

Table 11. ED visits by primary ED diagnosis groups: United States, 2005

| Primary diagnosis group                                            | Number of visits in thousands | Percent distribution |
|--------------------------------------------------------------------|-------------------------------|----------------------|
| All visits . . . . .                                               | 115,323                       | 100.0                |
| Contusion with intact skin surface . . . . .                       | 4,880                         | 4.2                  |
| Abdominal pain . . . . .                                           | 4,628                         | 4.0                  |
| Chest pain . . . . .                                               | 4,438                         | 3.8                  |
| Acute upper respiratory infection, excluding pharyngitis . . . . . | 4,316                         | 3.7                  |
| Open wound, excluding head . . . . .                               | 4,031                         | 3.5                  |
| Spinal disorders . . . . .                                         | 2,903                         | 2.5                  |
| Cellulitis and abscess . . . . .                                   | 2,663                         | 2.3                  |
| Sprains and strains, excluding ankle and back . . . . .            | 2,541                         | 2.2                  |
| Sprains and strains of neck and back . . . . .                     | 2,493                         | 2.2                  |
| Fractures, excluding lower limb . . . . .                          | 2,299                         | 2.0                  |
| Otitis media and eustachian tube disorders . . . . .               | 2,216                         | 1.9                  |
| Open wound of head . . . . .                                       | 2,186                         | 1.9                  |
| Rheumatism, excluding back . . . . .                               | 1,840                         | 1.6                  |
| Urinary tract infection, site not specified . . . . .              | 1,813                         | 1.6                  |
| Asthma . . . . .                                                   | 1,770                         | 1.5                  |
| Chronic and unspecified bronchitis . . . . .                       | 1,657                         | 1.4                  |
| Superficial injuries . . . . .                                     | 1,600                         | 1.4                  |
| Unspecified viral and chlamydial infections . . . . .              | 1,598                         | 1.4                  |
| Acute pharyngitis . . . . .                                        | 1,596                         | 1.4                  |
| Heart disease, excluding ischemic . . . . .391–392.0,393-          | 1,572                         | 1.4                  |
| All other diagnoses . . . . .                                      | 62,280                        | 54.0                 |

Table 11. ED visits by hospital discharge diagnosis: United States, 2005

| Principal diagnosis group and ICD-9-CM code(s) <sup>1</sup>                            | Number of visits in thousands | Percent distribution |
|----------------------------------------------------------------------------------------|-------------------------------|----------------------|
| All visits . . . . .                                                                   | 13,867                        | 100.0                |
| Heart disease, excluding ischemic . . . . . 391-392.0,393-398,402,404,415-416,420-429  | 1,057                         | 7.6                  |
| Chest pain . . . . . 786.5                                                             | 786                           | 5.7                  |
| Pneumonia . . . . . 480-486                                                            | 613                           | 4.4                  |
| Ischemic heart disease . . . . . 410-414                                               | 486                           | 3.5                  |
| Cerebrovascular disease . . . . . 430-438                                              | 378                           | 2.7                  |
| Psychoses, excluding major depressive disorder . . . . . 290-295,296.0-296.1,296.4-299 | 368                           | 2.7                  |
| Chronic and unspecified bronchitis . . . . . 490-491                                   | 257                           | 1.9                  |
| Cellulitis and abscess . . . . . 681-682                                               | 257                           | 1.9                  |
| Fracture of the lower limb . . . . . 820-829                                           | 247                           | 1.8                  |
| Syncope and collapse . . . . . 780.2                                                   | 240                           | 1.7                  |
| Urinary tract infection, site not specified . . . . . 599.0                            | 234                           | 1.7                  |
| Asthma . . . . . 493                                                                   | 233                           | 1.7                  |
| Fractures, excluding lower limb . . . . . 800-819                                      | 232                           | 1.7                  |
| Diabetes mellitus . . . . . 786.5                                                      | 219                           | 1.6                  |
| Malignant neoplasms . . . . . 140-208,230-234                                          | 217                           | 1.6                  |
| Disorder of gallbladder and biliary tract . . . . . 574-576                            | 200                           | 1.4                  |
| Anemias . . . . . 280-285                                                              | 199                           | 1.4                  |
| Abdominal pain . . . . . 789.0                                                         | 186                           | 1.3                  |
| Gastrointestinal hemorrhage . . . . . 578                                              | 182                           | 1.3                  |
| Poisonings . . . . . 960-989                                                           | 155                           | 1.1                  |
| All other diagnoses . . . . .                                                          | 7,119                         | 51.3                 |

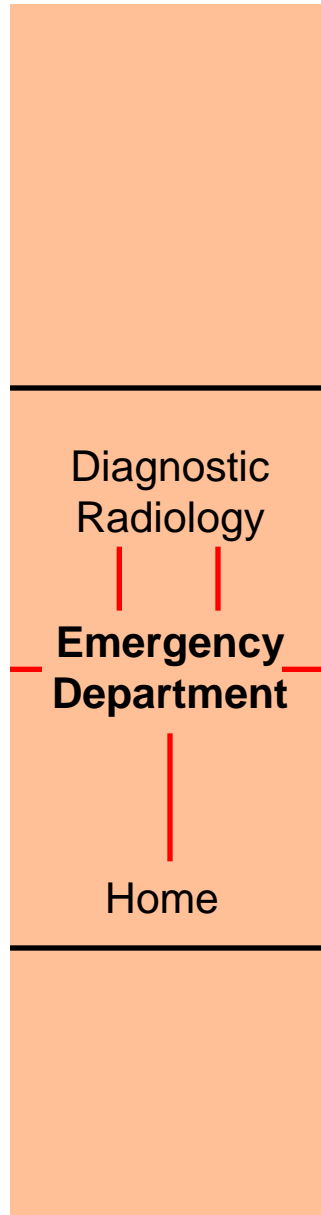
# Projected NIH Expenditures 2009

|                                 |               |
|---------------------------------|---------------|
| 1 Biotechnology                 | 9,794,000,000 |
| 2 Clinical Research             | 8,688,000,000 |
| 3 Prevention                    | 6,739,000,000 |
| 4 Cancer                        | 5,654,000,000 |
| 5 Genetics                      | 4,865,000,000 |
| 6 Neurosciences                 | 4,823,000,000 |
| 7 Brain Disorders               | 4,671,000,000 |
| 8 Pediatric                     | 3,188,000,000 |
| 9 Behavioral and Social Science | 3,057,000,000 |
| 10 Infectious Diseases          | 3,045,000,000 |
| 11 Clinical Trials              | 2,958,000,000 |
| 12 HIV/AIDS 1/                  | 2,913,000,000 |
| 13 Health Disparities           | 2,732,000,000 |
| 14 Aging                        | 2,461,000,000 |
| 15 Minority Health              | 2,393,000,000 |
| 16 Cardiovascular               | 2,361,000,000 |
| 17 Heart Disease                | 2,111,000,000 |
| 18 Mental Health                | 1,849,000,000 |
| 19 Emerging Infectious Diseases | 1,815,000,000 |
| 20 Biodefense                   | 1,748,000,000 |
| 21 Substance Abuse              | 1,522,000,000 |
| 22 Bioengineering               | 1,478,000,000 |
| 23 Vaccine Related              | 1,341,000,000 |
| 24 Immunization                 | 1,324,000,000 |
| 25 Digestive Diseases           | 1,231,000,000 |

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# Emergency Care

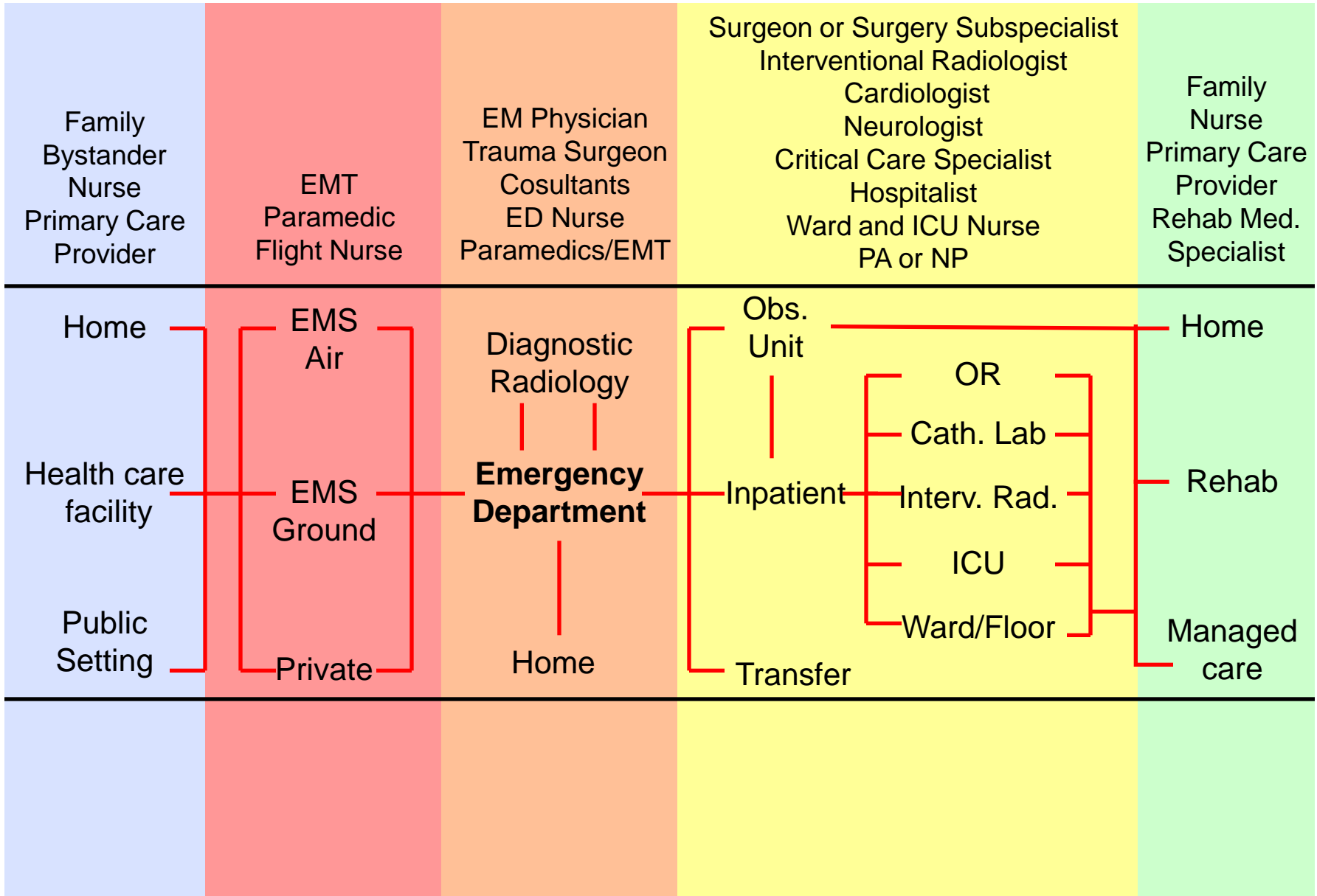


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# Emergency Care



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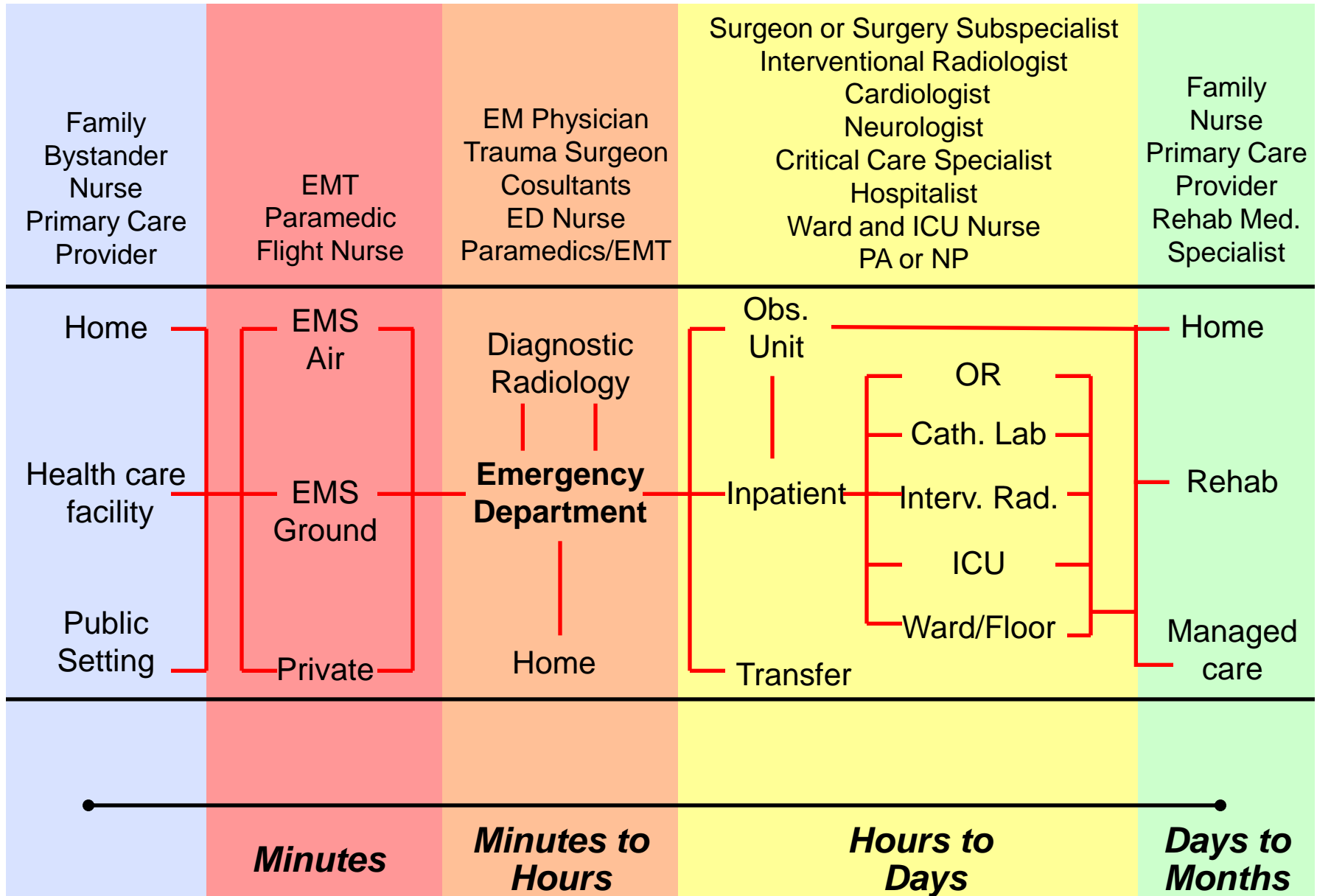
- Patients
- Diseases
- Places
- Practitioners
- Timing
- Strengths and challenges

# Emergency Care Research *Hypothesis*

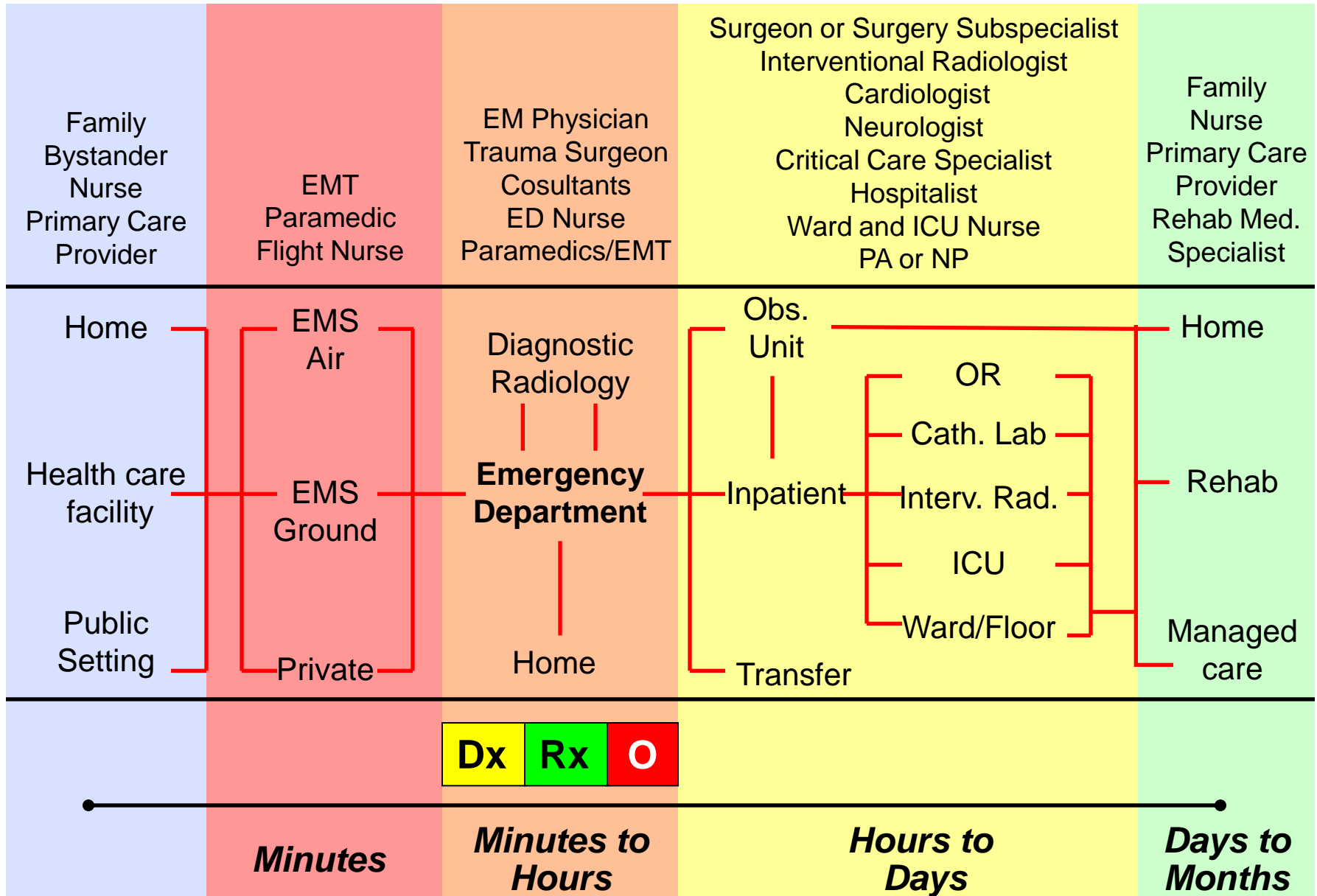
***“Rapid diagnosis and early intervention in acute illness or acutely decompensated chronic illness improves patient outcomes.”***

*Neumar, Ann Emerg Med, 2007*

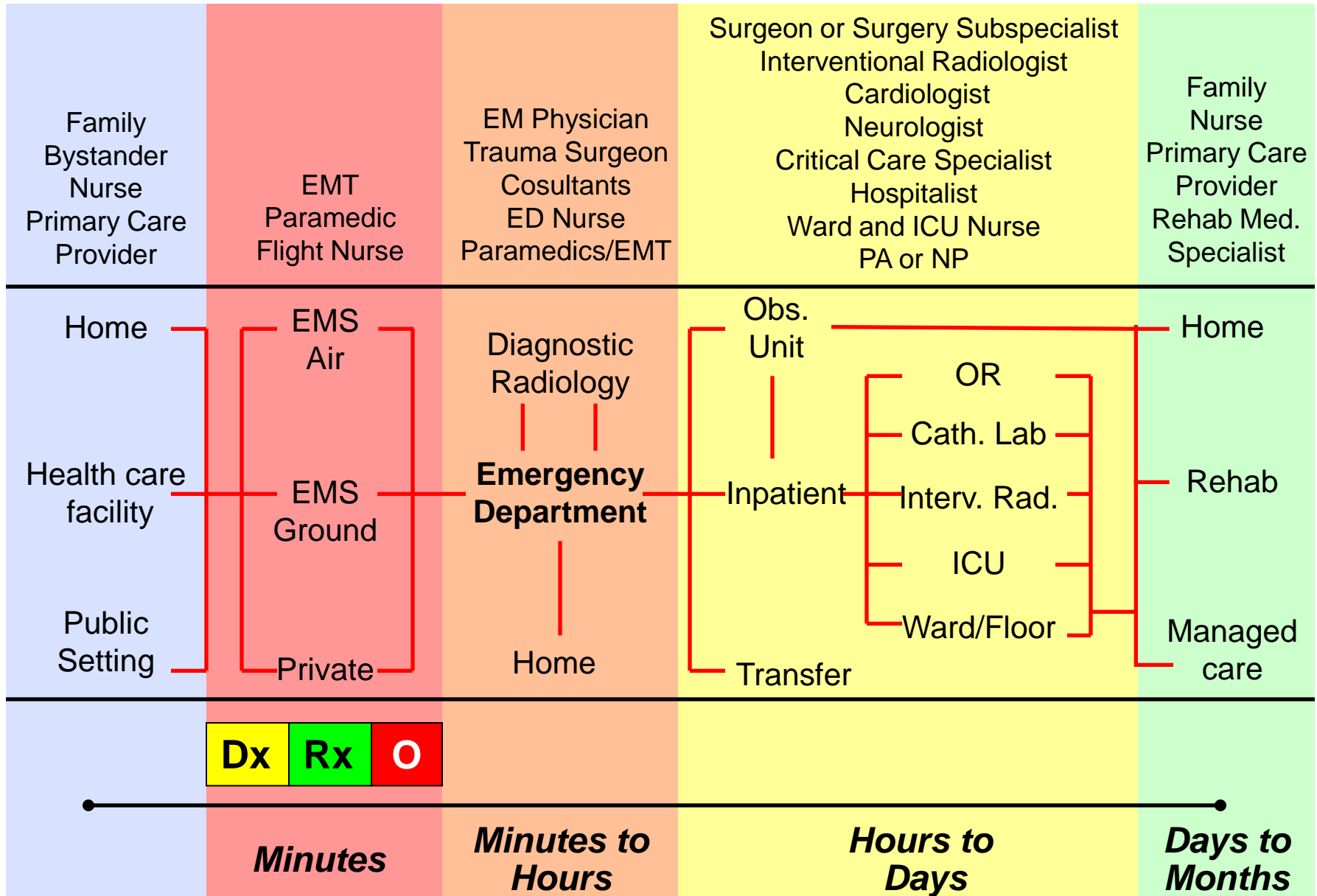
# Emergency Care



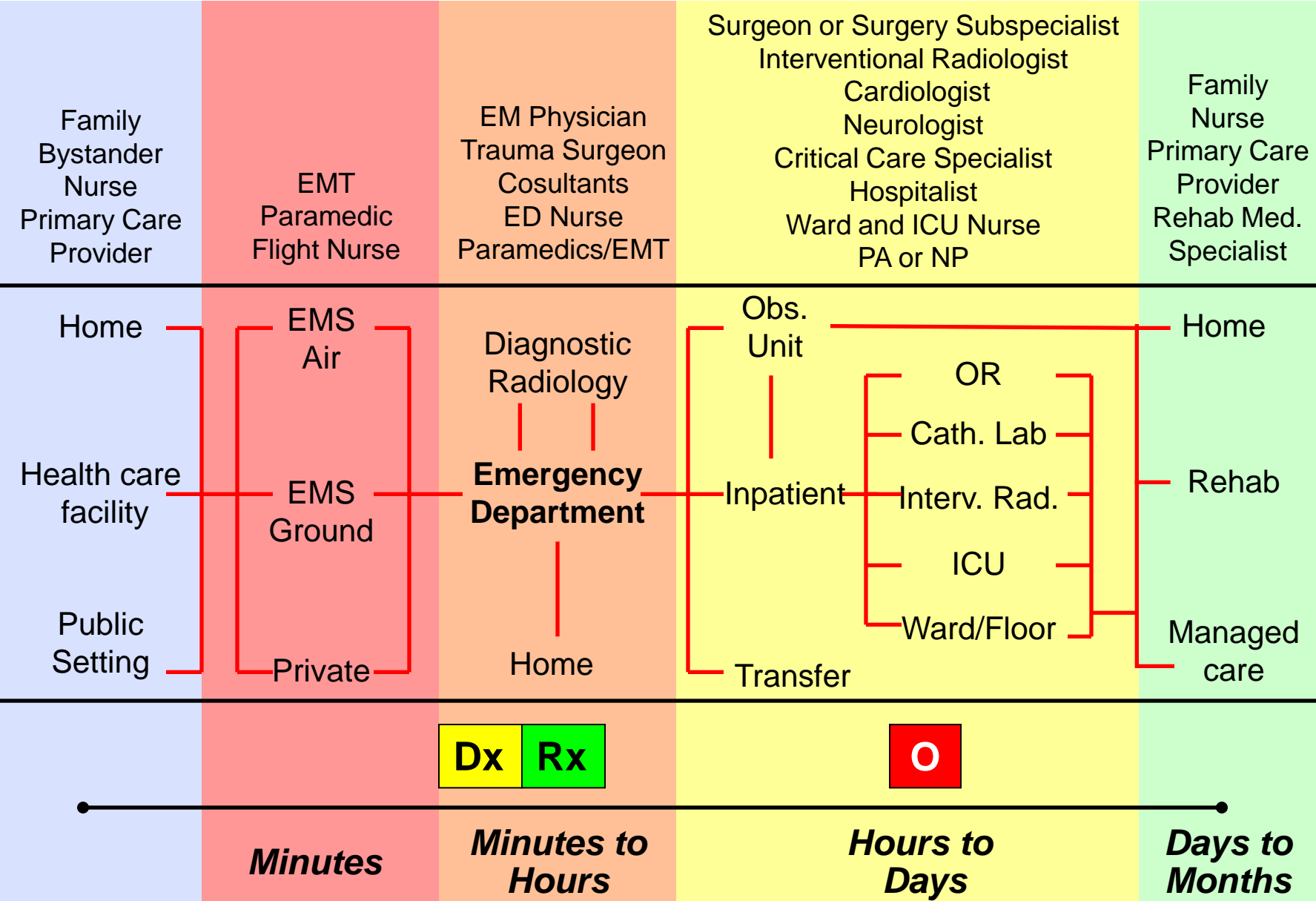
# Emergency Care Research



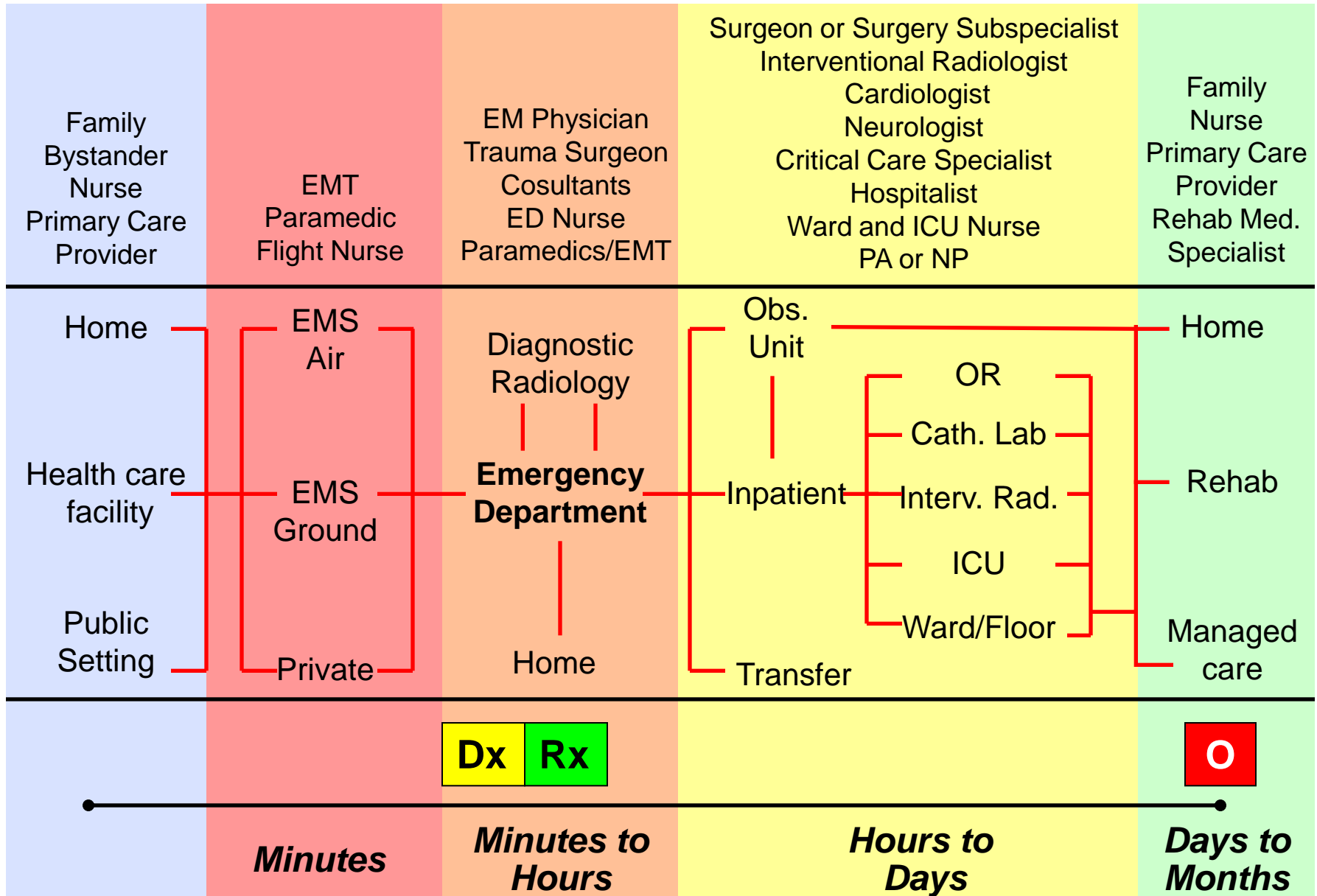
# Emergency Care Research



# Emergency Care Research



# Emergency Care Research



Family  
Bystander  
Nurse  
Primary Care  
Provider

EMT  
Paramedic  
Flight Nurse

EM Physician  
Trauma Surgeon  
Cosultants  
ED Nurse  
Paramedics/EMT

Surgeon or Surgery Subspecialist  
Interventional Radiologist  
Cardiologist  
Neurologist  
Critical Care Specialist  
Hospitalist  
Ward and ICU Nurse  
PA or NP

Family  
Nurse  
Primary Care  
Provider  
Rehab Med.  
Specialist

Home

EMS  
Air

Diagnostic  
Radiology

Obs.  
Unit

Home

Health care  
facility

EMS  
Ground

**Emergency  
Department**

Inpatient

OR

Cath. Lab

Interv. Rad.

Rehab

Public  
Setting

Private

Home

Transfer

ICU

Ward/Floor

Managed  
care

**Dx** **Rx**

**O**

*Minutes*

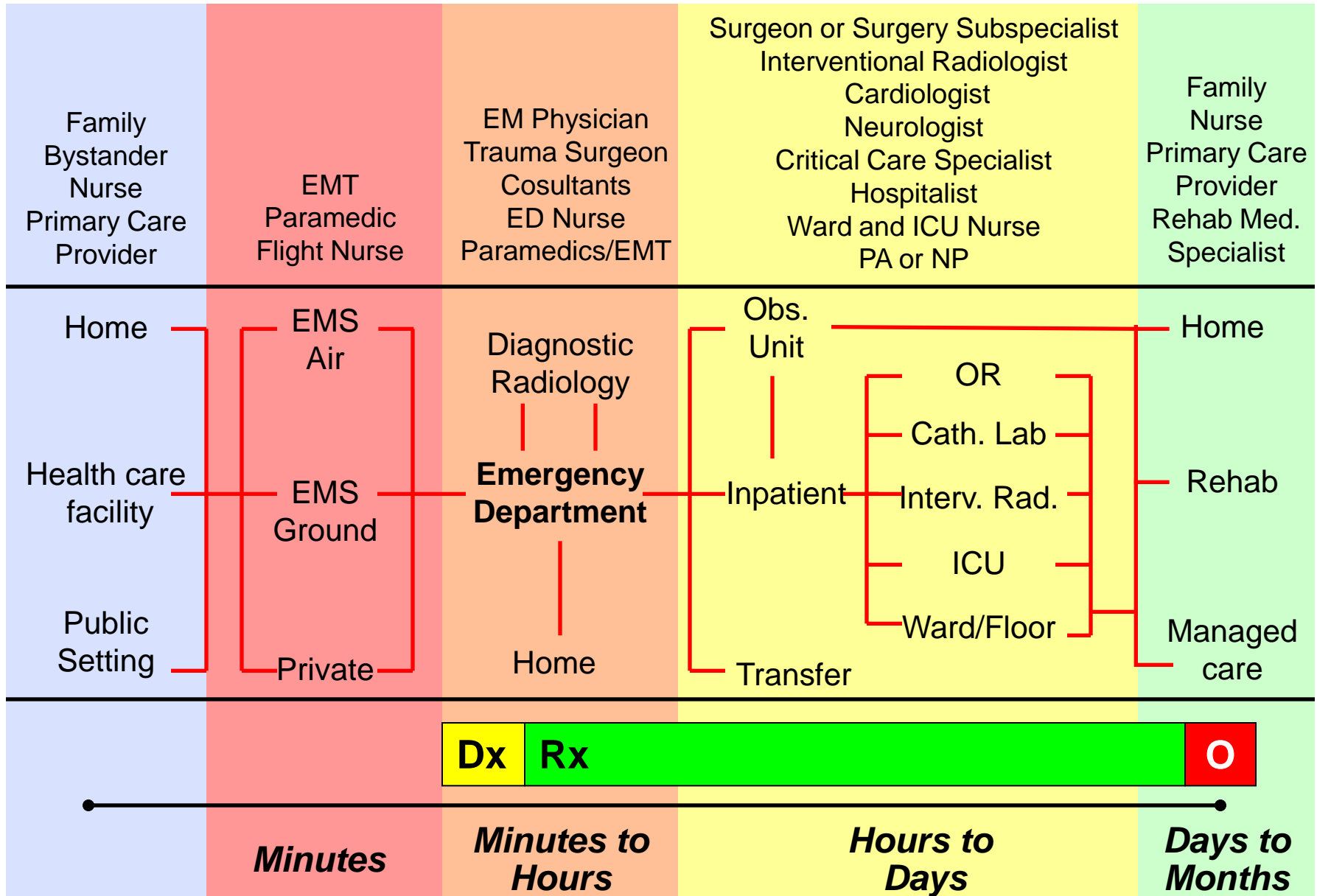
*Minutes to  
Hours*

*Hours to  
Days*

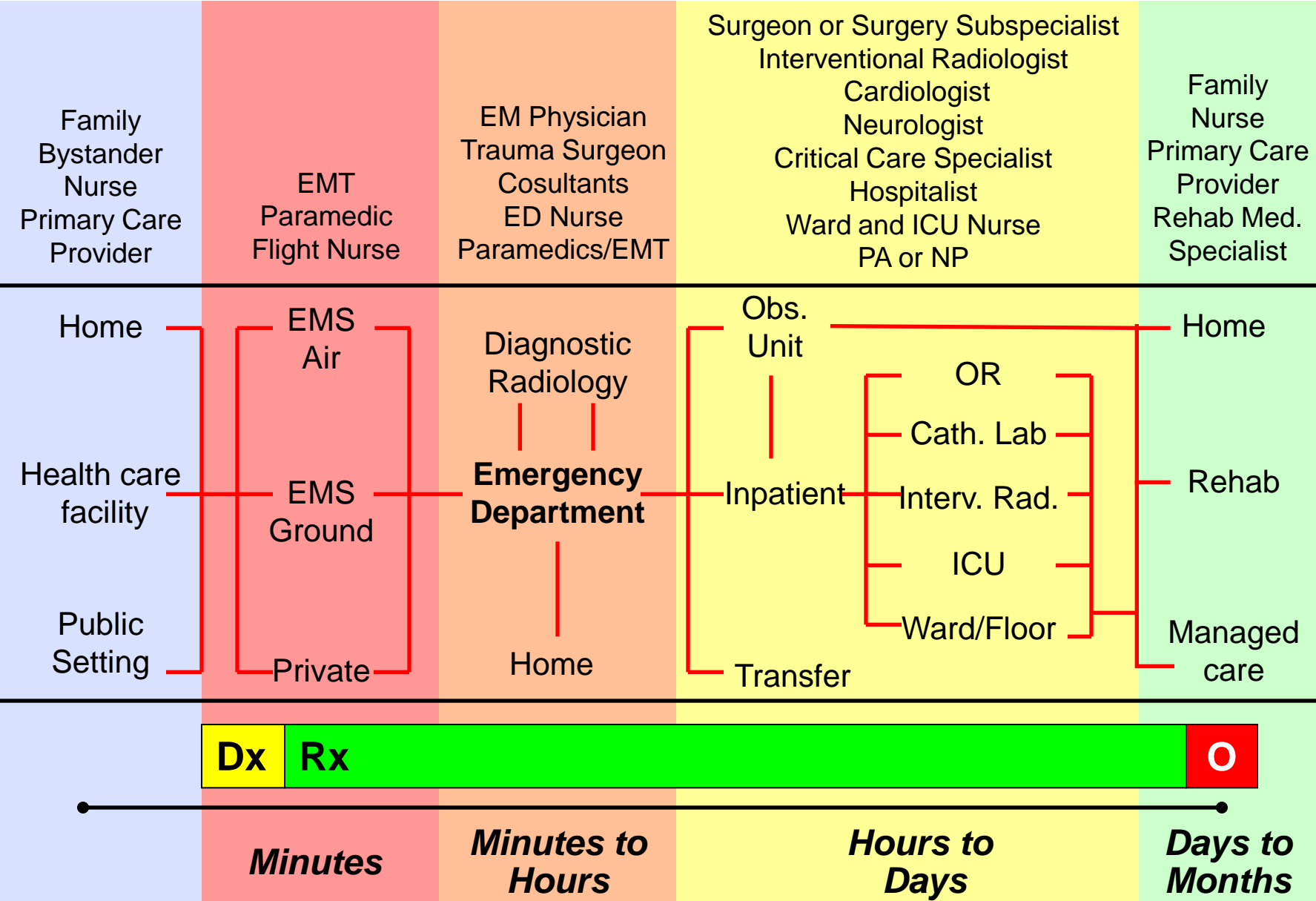
*Days to  
Months*



# Emergency Care Research



# Emergency Care Research



# Defining The State of Emergency Care Research

- Patients
- Diseases
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- Practitioners
- Timing
- Strengths and challenges

# Emergency Care Research *Strengths*

- 24/7/365 operation
- High acuity
- High volume
- Concentrated resources
- Patient access
- Integral part of health care system

# Emergency Care Research *Challenges*

- Unscheduled
- Multiple locations and providers
- Time sensitive diagnosis and treatment
- Consent
- Standardized data elements
- Interoperable data sets
- Investigator training infrastructure

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# **Conference on Emergency Care Research Networks**

May 28, 2008

Marriott Wardman Park Hotel

Washington DC

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**Supported by:**

**The Society for Academic Emergency Medicine (SAEM)**

**and the**

**The American College of Emergency Physicians (ACEP)**