

## Are Patients' Chief Complaints Generally Specific to One Organ System?

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**Background:** The coordinator of care function is one of the most important roles played by primary care physicians. This role is essential for efficient delivery of healthcare to patients with unfocused medical problems.

**Objectives:** To identify which chief complaints are unfocused and to determine how often visits to office-based physicians are for unfocused chief complaints.

**Study Design:** Retrospective review of National Ambulatory Medical Care Survey data.

**Methods:** We defined an unfocused chief complaint as one for which fewer than 95% of the office visits for the top 10 diagnoses associated with that chief complaint were related to a single organ system or specialty area. We analyzed data from the 1990-1994 National Ambulatory Medical Care Survey to determine the frequency of new patient visits to physicians for different chief complaints and to determine the frequency with which common chief complaints yield diagnoses in a single organ system.

**Results:** The 3 most common chief complaints in each of 12 symptom categories accounted for 80 million (32%) of the 250 million new patient office visits made during the survey period. Unfocused conditions accounted for 26% of visits for these chief complaints. The unfocused chief complaints included musculoskeletal conditions (back pain, knee pain, low back pain), mental/nervous system conditions (anxiety/nervousness, smoking problems, headaches, vertigo/dizziness), abnormal pulsations, swollen glands, and abdominal pain.

**Conclusions:** Patients' chief complaints and the resulting diagnoses are often within the same organ system. We found that a coordinator of care role for primary care physicians is appropriate for common neurologic, rheumatologic, and general complaints. A coordinator of care is not needed for specific specialty areas, including ophthalmology, dermatology, obstetrics/gynecology, urology, and otolaryngology, because patients typically can accurately self-refer to these specialists. Our study did not address reasons to use primary care physicians as coordinators of care, such as preventive care, patient preference, or cost effectiveness of care.

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Primary care is defined as first-contact, comprehensive, continuous, and coordinated care provided to populations that are not differentiated by sex, disease, or organ system.<sup>1-3</sup> Within this umbrella definition, the primary care physician serves many specific roles in the healthcare system. One of these roles is that of coordinator of care. As a coordinator of care, the primary care physician synthesizes information from multiple sources. For patients who require specialty care, the primary care physician serves as a resource to help patients identify the appropriate specialist to meet their medical needs.

A coordinator of care is most clearly needed by patients with unfocused medical problems. These patients have problems that could relate to 1 of several specialties. By using a primary care provider as a guide, the patient can be routed efficiently to the appropriate specialist. For patients who have a well-focused complaint and can correctly identify the appropriate specialist, an initial visit to a primary care physician might not be cost efficient if it is solely for the purpose of identifying the appropriate specialist.<sup>4</sup>

The set of chief complaints that are unfocused has not been defined, nor has a quantitative definition of an unfocused problem been created. This is by itself a complex issue, difficult to define by a single statis-

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tic. Are chief complaints that are related to a specific specialty 90% of the time focused or unfocused? Should the cutoff be 95% or 98%? The purpose of our study was to provide an initial estimate and understanding of how focused common chief complaints are. For common chief complaints, we provide descriptive data on how often the associated diagnoses are limited to a single organ system or specialty area.

... METHODS ...

The National Ambulatory Medical Care Survey (NAMCS) is a national survey of office-based physicians conducted by the Division of Health Care Statistics of the National Center for Health Statistics of the Centers for Disease Control and Prevention.\* This survey contains data on individual visits to office-based physicians that are then weighted to reflect national estimates describing the utilization of ambulatory medical care services in the United States. Non-federal physicians classified by the American Medical Association or the American Osteopathic Association as providing office-based patient care and all physician specialties except anesthesiology, pathology, and radiology are included in the NAMCS. Data are collected from physicians or office staff who complete a patient record form providing the patient's reason for visit classification, or chief complaint,<sup>†</sup> diagnoses (coded using *The International Classification of Diseases, Ninth Revision, Clinical Modification* [ICD-9-CM]<sup>5</sup>), demographic data, services provided, and referral practices. In small practices, 100% of patient visit data are available, while in large practices 20% of patient visits are randomly sampled. Patient visits are sampled during a randomly assigned 1-week reporting period.

In our study, we used data from a total of 181,446 NAMCS records from 1990 to 1994, which reflect the experience of more than 3.5 billion visits to office-based physicians. To obtain these national estimates, each individual record is assigned an inflation factor called the patient visit weight that is then used to predict the total number of office visits made in the United States. All estimates from the

NAMCS are related to the number of patient visits and subject to sampling variability. The relative standard error is used to measure the sampling variability. Representative relative standard errors for estimates derived from the 1994 NAMCS are as follows: 8.1% for estimates of 10,000,000 visits, 23.9% for estimates of 1,000,000 visits, 33.6% for estimates of 500,000 visits, and 74.8% for estimates of 100,000 visits. Relative standard error rates from other years are similar. When considering the reliability of the estimates, the National Center for Health Statistics considers an estimate to be reliable if it has a relative standard error of 30% or less of the estimate.

To analyze the NAMCS data regarding chief complaints (reasons for outpatient visits to office-based physicians), we took a multifaceted approach. First, we divided all chief complaints by type of complaint, as defined by the NAMCS reason for visit classification, to determine the proportion of all visits to office-based physicians that each type of reason comprised. The reason for visit classification is divided into 8 modules, or groups of reasons: symptom, disease, diagnostic and screening, treatment, injury and adverse effects, test results, administrative, and uncodable.

To analyze patients' chief complaints, we reviewed data only from visits for symptoms for new, nonreferred patients with 1 and only 1 reason for the visit. The "symptom module" accounts for 58.7% of all visits and is subdivided into categories relating to organ systems. We adhered closely to the reason for visit categories, with the exception of further subdividing several categories to make them more descriptive and to make them correlate better with specialty fields. For example, we divided genitourinary symptoms and diseases into urinary symptoms and diseases and obstetric/gynecologic symptoms and diseases. Similarly, symptoms pertaining to the eye and ear, which are in 1 category as defined by the NAMCS, were subdivided into an eye symptom category and an ear symptom category. Symptoms and diseases pertaining to the nose and throat were removed from the respiratory symptoms and diseases categories and combined with ear symptoms and diseases to obtain a combined ear, nose, and throat category in both the symptoms and disease modules.

Next, we analyzed the data to identify the 3 most common chief complaints within the 12 symptom module categories from the previous analysis. We did not use the disease module categories because we wanted to avoid including patients who sought medical help for a previously diagnosed problem. We also

\*Additional documentation is available online at: [ftp://ftp.cdc.gov/pub/Health\\_Statistics/NCHS/Dataset\\_Documentation/NAMCS/](ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NAMCS/).

<sup>†</sup>Additional documentation is available online at: <http://www.cdc.gov/nchs/data/rvc97.pdf>

did not use the remaining modules, because they lacked specificity to an organ system or specialty area. For each symptom module category, we determined the 3 most common chief complaints and the respective number of visits to office-based physicians for that complaint. We also determined the proportion of all visits within that category comprised by the 3 most common chief complaints.

The proportion of chief complaints that resulted in a diagnosis related to its specified organ system or specialty was determined for the 3 most common chief complaints in each reason for visit category. To do this, we individually reviewed the diagnoses listed at visits for each chief complaint to determine whether they were associated with the corresponding organ system or specialty. We chose not to use the ICD-9-CM code range pertaining to the organ system as the criterion, because that approach would omit many relevant diagnoses, such as those for infectious and neoplastic diseases (for example, using the skin disease range would omit such common diagnoses as wart [ICD-9-CM code 078.10] and basal cell carcinoma [173.9]). For musculoskeletal conditions, the diagnosis list was reviewed twice, once for association with rheumatologic conditions and once for association with orthopedic conditions.

Individual chief complaints were commonly associated with numerous diagnoses; in some cases, many of these accounted for only a tiny proportion (< 0.2%) of the visits. We considered several methods to limit the analysis: limiting the diagnoses considered to those accounting for at least 1% or 0.5% of visits for the given chief complaint; limiting the diagnoses to include at least 80% or 90% of all visits for the chief complaint; and limiting the analysis to the 5 or 10 most common diagnoses. We chose the last approach because of our need to individually examine each diagnosis, because of the marked differences between chief complaints in the number and distribution of associated diagnoses, and to provide consistency in the analysis of different chief complaints. Of the most common 10 diagnoses, we determined the proportion of diagnoses within the same organ system or specialty as the chief complaint by individually examining each diagnosis. In a few instances, a diagnosis that could not be assigned with certainty to an organ system or specialty appeared in the 10 most common diagnoses (these included other entries, routine child health checks, postsurgical status, observation, and illegible entry); these visits were omitted from the analysis.

We defined an unfocused chief complaint as one for which fewer than 95% of the visits to office-based physicians for the top 10 diagnoses associated with that chief complaint were related to a single organ system or specialty area.

To permit direct correlation of the diagnoses made at the visit to the patients' chief complaint, we sought to include only patients who had not been told to what organ system or specialty their problem related. Consequently, we included data only from new, non-referred visits to office-based physicians by patients with 1 and only 1 reason for the visit. Using this criterion, we excluded patients who had already been given a diagnosis by a physician.

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... RESULTS ...

Over the 1990-1994 period, there were 3.5 billion visits to office-based physicians in the United States. Of these, 250 million (6.9%) were for new, non-referred patients with 1 and only 1 chief complaint. Chief complaints related to symptoms were the most common category, accounting for 154 million visits (59% of all new, nonreferred patients with 1 chief complaint).

Within the symptoms category, the reason for visit was further subclassified into 12 groups: musculoskeletal (32.6 million visits); skin, hair, and nails (27.4 million); respiratory (17.8 million); ear, nose, and throat (16.6 million); eye (14 million); digestive (10.6 million); general (10.4 million); obstetric/gynecologic (7.7 million); urinary (5.7 million); neurologic (5.5 million); psychiatric/mental (5.0 million); and cardiovascular/lymphatic (1.1 million).

For each organ system or specialty-specific reason for visit category, we identified the 3 most common chief complaints, as well as the proportion of all chief complaints within that category that they comprised (**Table 1**). The proportion of all chief complaints comprised by the 3 most common complaints varied greatly among categories. For example, the 3 most common reasons for visiting a physician for a nervous system complaint (headaches, vertigo, and convulsions) together comprise 87.0% of all nervous system complaints. The 3 most common obstetric/gynecologic reasons for an office visit (vaginal discharge, lump in breast, and absence of menstruation) together comprise only 25.7% of all obstetric/gynecologic complaints. Overall, the 3 most common chief complaints in the 12 symptom module categories accounted for 32% of all visits for all new, nonre-

**Table 1.** Three Most Common Chief Complaints in Each Reason for Visit Category

Reason Category	Reason Code	Reason for Visit (Chief Complaint)	Estimated Total Number of Visits* (Thousands)	Proportion of All Complaints Within Reason Category
General	1050.1	Chest pain	1961	18.9
	1010.0	Fever	1205	11.6
	1015.0	Tiredness	944	9.1
		<b>Total</b>	<b>4110</b>	<b>39.6</b>
Mental	1110.0	Depression	2015	40.5
	1100.0	Anxiety/nervousness	1086	21.9
	1140.0	Smoking problems	442	8.9
		<b>Total</b>	<b>3543</b>	<b>71.3</b>
Nervous	1210.0	Headaches	3261	59.0
	1225.0	Vertigo/dizziness	1194	21.6
	1205.0	Convulsions	3556	6.4
		<b>Total</b>	<b>8011</b>	<b>87.0</b>
Cardiovascular	1275.1	Swollen glands	396	36.4
	1260.0	Abnormal pulsations	254	23.4
	1260.3	Irregular heartbeats	116	10.7
		<b>Total</b>	<b>766</b>	<b>70.5</b>
Eye	1305.2	Diminished vision	6793	48.5
	1320.1	Pain in eye	1007	7.2
	1305.3	Extraneous vision	740	5.3
		<b>Total</b>	<b>8540</b>	<b>61.0</b>
Respiratory	1455.1	Sore throat	6016	33.8
	1440.0	Cough	5796	32.5
	1445.0	Head cold	2337	13.1
		<b>Total</b>	<b>14,149</b>	<b>79.4</b>
Digestive	1545.1	Abdominal pain, NOS	2696	25.4
	1595.0	Diarrhea	1176	11.1
	1545.0	Stomach pain	861	8.1
		<b>Total</b>	<b>4733</b>	<b>44.6</b>
Urinary	1650.0	Painful urination	1148	20.2
	1645.0	Urinary frequency/urgency	524	9.2
	1640.1	Blood in urine	461	8.1
		<b>Total</b>	<b>2133</b>	<b>37.5</b>
Dermatologic	1860.0	Rash	8097	29.6
	1830.0	Acne	3573	13.1
	1865.0	Skin lesion	2440	8.9
		<b>Total</b>	<b>14,110</b>	<b>51.6</b>
Musculoskeletal	1905.1	Back pain	4284	13.1
	1925.1	Knee pain	4058	12.4
	1910.1	Low back pain	3308	10.1
		<b>Total</b>	<b>11,650</b>	<b>35.6</b>
Ear, Nose, Throat	1355.1	Earache	6240	42.5
	1400.0	Nasal congestion	2118	14.4
	1360.0	Plugged feeling in ear	1583	10.8
		<b>Total</b>	<b>9941</b>	<b>67.7</b>
Obstetric/Gynecologic	1760.0	Vaginal discharge	797	10.4
	1805.0	Lump in breast	593	7.7
	1730.0	Absence of menstruation	585	7.6
		<b>Total</b>	<b>1975</b>	<b>25.7</b>

NOS = not otherwise specified.

\*The number of visits for each survey year are combined into an aggregate estimate.

ferred patients with 1 symptom-related chief complaint.

For each of the 3 most common reasons for an office visit in the 12 symptom categories, we determined what proportion they made up of the 5 and 10 most common diagnoses within a single specialty area. For most of the common chief complaints, the 5 most common diagnoses were all within 1 specialty area. Only nervous system symptoms and rheumatologic symptoms resulted in a significant number of the 5 most common diagnoses not falling within 1 specialty area. When we extended the analysis to include the 10 most common diagnoses, the proportion falling within 1 specialty area fell slightly, yet remained high (Table 2). Again, nervous system symptoms and rheumatologic symptoms were the least likely to result in diagnoses within a single specialty area.

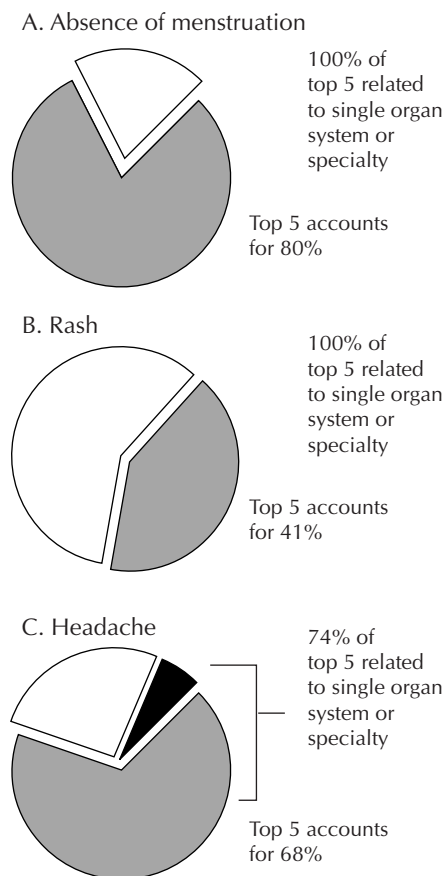
The proportion of diagnoses comprising the 5 and 10 most frequent diagnoses for common chief complaints varied markedly between symptom categories (Figure). The 10 most common diagnoses for the ear, nose, and throat symptoms we studied made up more than 80% of all diagnoses for each symptom. Among the 10 most frequent diagnoses for dermatologic symptoms, rash and skin lesion barely made up more than 50% of all diagnoses for those symptoms. Such was also the case for abdominal pain. For these conditions, we examined the 20 most frequent diagnoses associated with these chief complaints. All 20 of the most common diagnoses made for patients with a rash were found to be related to skin, comprising 67.9% of all diagnoses made for rash. The 20 most frequent diagnoses made for patients with abdominal pain were found to be related to the digestive system in

**Table 2.** Proportion of Diagnoses Within a Single Specialty Area for the Three Most Common Chief Complaints in Each Reason for Visit Category

Reason Category	Reason for Visit (Chief Complaint)	Proportion of Top 10 Diagnoses Within Specialty Area (Proportion of All Diagnoses)
Mental	Depression	100.0 (79.0)
	Anxiety/nervousness	94.8 (61.3)
	Smoking problems	78.2 (98.9)
Nervous	Headaches	69.9 (74.2)
	Vertigo/dizziness	52.0 (58.8)
	Convulsions	98.6 (91.9)
Cardiovascular/Lymphatic	Swollen glands	68.6 (83.1)
	Abnormal pulsations	93.7 (77.6)
	Irregular heartbeats	100.0 (83.3)
Eye	Diminished vision	100.0 (67.9)
	Pain in eye	100.0 (52.3)
	Extraneous vision	96.8 (64.8)
Respiratory	Sore throat	100.0 (88.7)
	Cough	96.1 (80.3)
	Head cold	100.0 (87.1)
Digestive	Abdominal pain, NOS	93.9 (54.1)
	Diarrhea	97.8 (78.5)
	Stomach pain	100.0 (67.3)
Urinary	Painful urination	100.0 (86.9)
	Urinary frequency/urgency	97.1 (69.6)
	Blood in urine	100.0 (80.3)
Dermatologic	Rash	100.0 (51.6)
	Acne	99.8 (95.0)
	Skin lesion	100.0 (50.6)
Rheumatologic	Back pain	33.6 (51.2)
	Knee pain	49.1 (53.4)
	Low back pain	29.9 (63.9)
Orthopedic	Back pain	88.7 (51.2)
	Knee pain	86.5 (53.4)
	Low back pain	75.4 (63.9)
Ear, Nose, Throat	Earache	98.4 (86.2)
	Nasal congestion	100.0 (82.8)
	Plugged feeling in ear	100.0 (89.1)
Obstetric/Gynecologic	Vaginal discharge	97.8 (81.5)
	Lump in breast	98.2 (91.8)
	Absence of menstruation	100.0 (88.9)

NOS = not otherwise specified.

**Figure.** Illustration of How the Proportion of Unfocused Complaints Varies for Selected Symptoms.



The white area represents the fraction of visits that were not accounted for by the 5 most common diagnoses. The grey area represents visits for these diagnoses that were associated with the chief complaint. The black area, where present, represents visits for these diagnoses that were not associated with the chief complaint.

A. The 5 most common diagnoses associated with the chief complaint of absence of menstruation accounted for 80% of all visits for absence of menstruation. One hundred percent of visits for these 5 most common diagnoses were gynecologic problems.

B. The 5 most common diagnoses associated with the chief complaint of rash accounted for only 41% of all visits for rash. One hundred percent of visits for these 5 most common diagnoses were dermatologic problems.

C. The 5 most common diagnoses associated with the chief complaint of headache accounted for 68% of all visits for headache. Of these visits, 74% had neurologic diagnoses and 26% did not.

91.8%, comprising 65.8% of all diagnoses for abdominal pain. For these conditions, extending our analysis to include more diagnoses had relatively little impact on the results.

... DISCUSSION ...

In a general sense, the concept of focused and unfocused chief complaints is easily understood. Defining these terms in a quantitative fashion, however, is challenging. We believe the best approach to understanding this issue is simply to describe how frequently common chief complaints are associated with diagnoses in the corresponding organ system or specialty. In our study, we also used an operational definition of unfocused chief complaint to simplify reporting of the results.

We found a number of conditions that were clearly unfocused. These included headaches, vertigo/dizziness, swollen glands, and musculoskeletal conditions. Our data strongly support the first-contact role of primary care providers for patients with these disorders. The data also indicate that many common chief complaints are remarkably well focused. For chief complaints related to the eyes, skin, genitourinary tract, and ears, nose, throat, the common chief complaints were very well focused. This suggests that patients who require specialty care in these areas (ophthalmology, dermatology, obstetrics/gynecology, urology, and otolaryngology) may not require initial contact with a primary care physician to receive the care they need. When insurance systems allow for self-referral to specialists, patients may already be selecting their care from specialists as appropriate.

The limitations of this study and the scope of our conclusions need to be carefully considered. First, we used survey data that have error associated with the estimates. By combining estimates from multiple years, we were able to increase the power of our data-gathering approach and improve the precision of the estimates. However, conclusions from this type of survey data would best be confirmed by a complementary data source. An additional limitation is that we chose a priori to analyze the 10 most common diagnoses associated with each chief complaint. These diagnoses accounted for more than 50% of all visits for every condition we analyzed; this is sufficient to ensure that what we have found to be unfocused truly is unfocused but limits our ability to determine with certainty whether focused problems are indeed focused. In those cases in which we did look at additional diagnoses (skin diseases and abdominal pain), we found that analysis of additional diagnoses did not significantly affect the results.

Another important issue affecting the scope of our conclusions is that we cannot conclude from

these data that patients with truly well-focused chief complaints need specialty care; that is, we cannot conclude that these patients would receive inadequate treatment for these problems by a primary care provider. Additionally, the data do not address the potential benefit from the preventive care offered by a primary care physician or whether specialty care is cost effective. These issues require further multifactorial analysis. Moreover, even if patients with well-focused chief complaints do need specialty care, we cannot conclude from the data presented here that they will know which specialist to see. We have demonstrated that for skin disease, however, patients who self-refer to dermatologists do have skin disease; whether this is true for other specialties has not been determined.

In those situations in which the problem is well focused, in which the patient can identify the appropriate specialist, and in which specialty care is needed or cost effective, direct access to the specialist might be desirable from both a cost and quality-of-care perspective. For the most common category of chief complaints (musculoskeletal symptoms) and several other common complaints, (ie, mental/nervous conditions, abnormal pulsations, swollen

glands, and abdominal pain) their unfocused character supports the use of primary care physicians as coordinators of care.

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