Guidelines for the Revision of Practice Data Sets

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As residencies and practices mature, a frequent undertaking is the revision of initial data sets and information systems. This report presents an expanded data set which has been developed in the Family Medicine Residency Program at the University of Rochester and suggests guidelines for the selection of data items and revision of existing information systems. In the selection of data items it is important to carefully identify planned use and definition of terms, as well as to carefully consider the complexity of the items and the realistic ability of personnel to maintain and update both individual items and the entire set of data. The implementation of a revised data system requires careful planning and frequent involvement of staff to insure accurate collection of information and proper management of workload. The implementation phase should not be considered complete until an ongoing system for reviewing and maintaining data is established.

In recent years, a constant debate has followed attempts to define the appropriate data base for ambulatory care. Such discussions have centered primarily on defining the minimum data appropriate for the informational needs of governmental agencies and reimbursement systems.[1-3] Family medicine practices and educational programs have information needs beyond these.[4] Several such data systems have been described in the recent literature.[5-21] As residencies and practices mature, a frequent undertaking is the revision of initial data sets and information systems. To facilitate this process, this report presents an expanded data set and guidelines for the selection and implementation of a data set, which have been found useful in the Family Medicine Residency Program at the University of Rochester.

Patient related information consists of both registration and encounter information.[9] Registration information is less likely to change once collected. It frequently is used at each encounter, and it should be checked periodically for updating purposes. Encounter data are new information that are likely to be different at each visit. Their collection is facilitated by use of the encounter form. Development and use of an encounter form has been previously reported by the author and others.[12,16,17]

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0094-3509/80/090437-06$01.50

Table 1. Expanded Data Set: Registration Demographic Data

1. Name
2. Clinic Number (should indicate household and position in household)
3. Address (consider including mailing address and census tract)
4. Telephone (home and business)
5. Birth Date (age)
6. Sex
7. Race
8. Ethnic Background (or country of birth)
9. Language
10. Marital Status
11. Religion
12. Socioeconomic Status
13. Educational Level (patient, parent, or spouse)
14. Income (family, patient, parent, or spouse)
15. Date of Last Registration Update

Expanded Data Base

Within family medicine environments, information needs frequently include demographic, practice management, financial, educational, and research data.

Demographic data that should be considered are presented in Table 1. These data are routinely collected at the time of registration and should be updated periodically. The numbering system used within the practice setting should allow for coding individuals, households, and position within the household (head, spouse, child, etc). Such a code has been presented previously.[9] In considering the address, mailing address as well as household address may be necessary. Census tract may also be an important address addition.[10] It may be used for practice management activities, such as identifying practice population, geographic distribution, lead belt populations,[22] or for research. If a socioeconomic status indicator is to be included as part of the demographic base, the specific code should be carefully evaluated.[18,23-26] The Hollingshead code should be considered.[27] A date of "last registration information update" may be useful in prompting practice staff to periodically review registration information.

Table 2 presents practice management data items. The joint practice item indicates that responsibility for a patient is shared between the family physician and other personnel such as a nurse practitioner. It may be of use to medical secretaries in scheduling patients, or in audit and surveillance activities. Date of last visit may be of use in inactivating charts. Activity status may be of use in maintaining medical records and guiding outreach efforts.[9] Disability status may be helpful in completion of insurance or compensation forms at a later date or in allowing the encounter form to fulfill a "super bill" function as outlined below.

Table 3 presents financial data which may be required. In assessing financial data needs, it may be helpful to check with the State Insurance Commissioner regarding the "super bill" concept. Most states will certify a properly designed encounter form as an acceptable vehicle of reimbursement if certain information is included on the form, such as disability information, income tax identification number, and Workers' Compensation information, which might otherwise not be incorporated into the form. An encounter form so certified may be used in lieu of insurance statements, disability claims, motor vehicle accident reports, or Workers' Compensation forms, if properly filled out.

Table 4 includes examples of educational and research items which may be appropriate to incorporate. Numerous other items in these categories may be added depending on the needs of a specific practice or educational setting.

Guidelines for Selection of Data Base Items

The careful selection of items for inclusion within a data set is essential for the proper performance of an information system. The following are guidelines for avoiding problems which the author has encountered.

1. *Identify the uses for each data item.* Frequently, items will be used by multiple personnel within a practice setting. Physician, billing, secretarial, medical records, and research staff all have specific overlapping information needs for similar

Table 2. Expanded Data Set: Practice Management

Registration	Encounter
1. Family physician	1. Date this visit
2. Joint practice flag (care shared with a nurse practitioner, physician's assistant, or other)	2. Time of visit (appointment, arrived, departed)
3. Team	3. Visit type (length, routine, complex, physical)
4. Date of first visit	4. Doctor of visit (code can indicate type [faculty, resident, nurse] and level of training)
5. Date of last visit (computer use)	5. Also to see: Name
6. Individual activity status	6. Facility and clinic (location and telephone number may be preprinted)
7. Household activity status	7. Outcome (appointment kept, rescheduled, broken, error, walk in)
8. High-risk surveillance flags (chronic disease, flu, vaccination)	8. Problem code (ICHPPC checklist)
9. No show status	9. Procedures (laboratory, x-ray, ECG)
10. Mail "next appointment reminder" flag	10. Next appointment (date, time, type, preliminary, laboratory, physician)

data items. All should be involved in the determination of the appropriate items or group of items for inclusion.

Socioeconomic status rubrics are an example of a complex group of items requiring careful determination of anticipated uses. Financial staff may desire such items to guide collection policy. Research staff may desire such items for categorizing populations. Physicians may wish to use similar items to aid in educational, referral, or treatment regimens. Unless all viewpoints are explored and taken into account, later inappropriate collection or misuse of information, including poor compliance by the disillusioned staff, may result.

2. *Define items in writing.* All items should be clearly defined and a practice glossary of definitions prepared. This glossary is of importance in assuring agreement and consistency in interpretation of items through initial and periodic review and use in orientation of new employees. The Glossary for Primary Care[26] is an excellent reference for the development of definitions. Compliance with this set of definitions will promote future comparability of data to the data from other systems.

3. *Review the complexity of items.* Certain items that at first appear straightforward will, at further review, involve complex issues. "Education status of parents" is such an item. While seemingly straightforward, issues requiring clarification include the identification of the parent in case of divorce and remarriage, and the treatment of graduate equivalency diploma or vocational training attainment.

Table 3. Expanded Data Set: Financial

Registration	Encounter
1. Individual responsible for bill	1. Current charge (patient, insurance)
2. Insurance(s) (carrier identification no., individual/group no., effective/termination dates)	2. Responsible party
3. Billing cycle or date	3. Current credits (cash, check, allowance, adjustments)
4. Special payment arrangement code (discount, courtesy, time payment)	4. Source of payment (patient, insurance, third party)
5. Billing status (current, past due)	5. Diagnosis for insurance
6. Credit status (collection, dismissed	6. Physician's workers' compensation no. and specialty certification
7. Balance	7. Physician's signature
8. Date of last payment	
9. Past due amounts (30, 60, 90, 180, 360 days)	
10. Institution or physician tax no.	

Table 4. Expanded Data Set: Educational and Research

Registration	Encounter
1. Special patient codes	1. Preceptor
	2. Type of preception (observation, one-way mirror, video, chart audit)
2. Study population codes	3. Study data items (patient problem code, drug prescription code)

4. *Consider whether it is realistic to collect and update registration information.* "Family stage" is an example of data which, while possibly valuable, may be difficult to update because of lack of knowledge of change of household membership or change in educational level of its members. Updating needs should be considered in determining items to be included on the encounter form. As an example, the updating of primary family physician, as opposed to physician of visit, was a

chronic problem within the Rochester Family Medicine Residency practice, which vanished when its visibility was enhanced by adding it to the encounter form.

5. *Consider future information needs.* If future needs are anticipated, they should be included during the initial formulation of the data set, but only if the above concerns are met. If uses and definitions are not clear, the item should be excluded. Significant error is introduced through changing of definitions or groups of items after data collection has been started. Frequently such errors cannot be anticipated at the time of change, or easily retrieved once detected.

Allow room, either on manual forms or within computerized data sets, for addition of items. The space may not be used, but will allow much easier and more timely expansion through decreasing the need to redesign and reprint forms or computer storage formats.

6. *Consider whether the complete set of information desired is realistic.* Once all items desired have been identified, it is crucial to determine whether staff or patients will be overwhelmed by the amount of information requested. Both the initial entry and updating of information must be considered. It is much better to eliminate items than to be faced with a set of data that becomes increasingly incorrect through improper updating. Estimating turnover of the practice population as well as status mobility (eg, address, insurance changes) may be helpful in anticipating the work involved in data maintenance (20 percent of the US population moves each year).

Implementation

Once the set of data items has been determined, appropriate planning for implementation of changes is the next critical step in developing an effective data base. While this activity will be largely determined by the characteristics of the practice involved, the guidelines described below may be helpful.

1. *Establish a master plan* for the transition, with input from all personnel involved. This is particularly important in large groups or residency settings, and will allow proper work delegation by medical records, secretarial, and billing staff. Careful attention should be given to workloads during the transition period. Proper staging of work will decrease the stress and workload required. As an example, in a recent transition in the Rochester Family Medicine Residency practice, the updating and correction of addresses was performed over a three-month period prior to other changes. The decrease in number of wrong addresses used for billing and other mailings was dramatic, and provided staff with time for other activities.

Immediately prior to implementation, definitions should be reviewed with the staff involved. At that time, it is important to set up a process for handling unforeseen dilemmas regarding definitions that may arise. In general, staff should be asked to use their best judgment, but to be sure to set aside the case in question for later review. Frequent discussion with staff involved during the implementation phase is important to assure proper interpretation of definitions.

2. *Review and rationalize information flow* within the practice setting. The changing of data items will require rethinking of both the forms used and the timing of information flow among secretaries, medical records, billing, and research personnel. To decrease problems occurring during transition, both should be reviewed. One form which may be of benefit, if not already present, is a preregistration form. This may be used in the office, or mailed to new or established patients, as warranted. It permits the patient to write down all registration information prior to the visit. It is particularly useful in collecting information such as insurance numbers, which the patient might not otherwise bring to the office.

3. *Plan for frequent feedback of information* to those responsible for collection and use. Within two to three months of initiating the collection of new information, its use should be apparent to staff, or a decrease in the data reliability can be anticipated. Physicians particularly need frequent feedback to motivate their continuing compliance with data collection. Feedback of patient lists or E-book data has been critical to maintaining the accuracy of information supplied by physicians.

4. *Set up a mechanism for the ongoing maintenance of the data system* once implementation is completed. Personnel should be identified who are responsible for ongoing review and troubleshoot-

ing of the data in each area of the practice. This group should meet periodically to review data needs, identify problems in either the collection or the maintenance of the data, and implement further changes as necessary. The group may wish to perform periodic audits to aid in identifying problems.

Conclusion

A frequent maturational activity of group practices or residencies is the revision of the initial data systems to meet more adequately the multiple practice management, financial, education, and research needs. An expanded data set is presented for use in identifying desired data items. In selection of data items, it is important to carefully identify the planned uses and definitions of items, as well as to carefully consider the complexity of the items and whether it is realistic to expect personnel to maintain and update both individual items and the entire set of data. In planning a data system, future needs should be considered, but not included unless exact characteristics of the information desired are known. The implementation of a revised data system requires careful planning and frequent involvement of staff to insure accurate collection of information and to assure proper management of workload. The implementation phase should not be considered complete until an ongoing system for reviewing and maintaining data is established.

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