

The Concept and Measurement of Continuity in Primary Care

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Abstract: Continuity of care, a stated fundamental principle of family medicine, is reviewed in terms of its philosophy and definitions. A model of continuity in primary medical practice is proposed, consisting of five elements: the provider, consumer, encounter type, knowledge base, and environment of

continuity. The elements are measurable, some more easily than others. There is need to define and operationalize the model more accurately in order to evaluate continuity in primary care medicine. (*Am J Public Health* 70:122-127, 1980.)

Philosophical Concepts

The growth of the middle class in the eighteenth century permitted physicians to earn enough money to live and practice on their own in one area over a significant period of time. The stability of the physician increased accountability to patients, and the new paternalism of the wealthy led to the widespread development of hospitals.¹ Continuity of care at this time was enhanced by the stability of population and doctor, but relied upon the doctor's memory; records were infrequently kept, and used mainly as aide-memoires for medications rather than as clinical records, a situation that continues to exist in many parts of the world today. The individual medical record achieved general acceptance only at the end of the nineteenth century.²

At the present time, concern over continuity of care seems to have grown in direct proportion to the increasing fragmentation of medical care, industrialization, and the mobility of patients and doctors alike.

There appears to be a diversity of opinion regarding the nature and definition of continuity of care with resultant difficulty in interpreting the relative importance of the studies undertaken on the subject so far. Most commentators in the field of Family Medicine, as well as some in Pediatrics, con-

tend that continuity is exemplified by the feeling of the physician which embodies a continuing and caring responsibility for the person and the family rather than concern about specific problems per se.³⁻⁶ It appears that this feeling of personal responsibility (even after regular office hours) grows, as continuity of care improves.³ It has also been suggested that the patient must accept certain responsibilities to maintain the "continuity contract." McWhinney notes that the nature of this contract is a central issue for family medicine and "is terminated only by mutual agreement, or by decision of one of the parties."⁶

Continuity of care is consequently viewed as an attitude as well as an activity and this seems to be the characteristic concept held by family physicians, in contrast to other disciplines which may regard it solely as a health care task.⁷ There is no established evidence, however, that the physician's feeling of responsibility leads to better care.

An overall assertion has been made by primary care physicians that continuity is important to ambulatory care. The Royal College of General Practitioners in Great Britain states that the doctor should provide the patient with personal, primary and continuous care, and some North American authors regard it as a crucial issue for Family Medicine.^{6, 8-10} It is also described as a hallmark of primary care and identified as an important factor in the quality of care, the control of medical costs, patient satisfaction and in the enactment of national health insurance.^{3, 11-13} Continuity also appears to be important to patients, to paramedical staffs, and to social scientists. Mechanic has observed that "if the physician is to respond to the individual, he must have some acquaintance with him and be sensitive to changing needs, and this requires time and continuity."¹⁴ If expectations of

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society include personal health care (that is when the system or the provider is interested in the patient as a person, rather than as a problem), then continuity of care is a prerequisite.

What are the benefits so far postulated to support the contention that continuity is an essential to patient care? A number of good outcomes have been attributed to continuity including:

- Improved doctor-patient relationships;^{3, 6}
- Increased knowledge of and interest in the patient by the physician and other health staff;^{13, 15}
- Promotion of confidence and rapport with the doctor and the facilitation of the disclosure of personal information;^{3, 15}
- Increased compliance and cooperation with medical instruction;^{3, 16, 17}
- Reduced hospitalization rates, episodes of sickness and number of laboratory tests;¹⁸
- Increased patient satisfaction;^{19, 20}
- Reduced levels of disability, discomfort and dissatisfaction in chronic disease; reduced costs;^{4, 20, 21}
- Reductions in missed appointments, and patient waiting time with improved punctuality;²¹⁻²³
- Improved recognition of existing or previously elicited health problems;¹⁵
- An improved environment for the use of psychotherapy;^{6, 24}
- The acquisition of new knowledge in primary care;^{6, 7}
- Improved management of family problems;⁷

In spite of this seemingly long list of benefits (some hypothetical, others confirmed by investigation) accruing from the provision of continuity of care, other authors have argued that the evidence that continuity alters the standards of medical practice is poor.^{4, 20, 25} There have been some definite negative findings. A survey of comprehensive care (which included continuity) in different population groups demonstrated that "emergency services" and "care available 24 hours a day" were ranked highest, while seeing the same physician or group at each visit was ranked lowest in 11 categories of comprehensive care.²⁰ In two studies demonstrating a positive desire for discontinuity, patients regarded all physicians as equally effective and indicated a need to obtain the services of more than one doctor.²⁰ In an attitude survey conducted by McDonald, et al, only six out of 375 patients experienced a desire to see only their personal physician and other investigators confirm that patients are not overly concerned with seeing only their own or the same doctor.²⁶⁻²⁸ Studies show that physicians personally value continuity of care.^{16, 29}

A Review of the Definition and Measurement of Continuity of Care

In order to establish the value of continuity in the medical care system, it is necessary to define and then measure it. The most comprehensive theoretical definition has been set out by Hennen who has defined five continuity dimensions: chronological, geographic, interdisciplinary, interpersonal, and informational.⁷ At a more operational level, a number of

authors have defined continuity of care in such a way that effective measurement can be implemented. The matching of theoretical definition to practical measurement has been succinctly discussed by Hansen.³⁰

Continuity of care has been defined by Bass and Windle as "the relationship between past and present care in conformity with the therapeutic needs of the patients."²⁴ Gordis and Markovitz studied continuity in the context of the availability to the patient of the pediatrician at all hours, with some assistance from nurses and social workers.⁴ According to Breslau and Reeb, continuity was "the extent to which a single physician manages the health needs of a patient . . . the more the patient visits occur with a single physician, the more care is considered continuous."¹¹ This measurable definition has been used by other authors,^{12, 29, 31} On the other hand, Shorr and Nutting define continuity as "the rates of transition between major clinical elements; screening, definitive diagnostic evaluation, treatment and follow-up."³² Shortell states that continuity of medical care is the extent to which medical care services are received as a coordinated and uninterrupted succession of events, consistent with the medical care needs of the patient.¹²

In addition to the difficulties of arriving at a reasonable definition, there has been some conceptual confusion between the "longitudinality" and the "continuity" of care. The former can be described as a locus of responsibility held over long periods of time—the regular source of care—but not necessarily related to the onset of presence of illness. On the other hand, continuity has often been used to describe care over the short term, either during an illness episode or for up to one or two years.

Based on some of the above definitions and methods of measurement, attempts to measure continuity so far fall into two main categories. The first is one in which a "discontinuity" situation is identified and changed to a "continuity" situation. Evidence is then obtained that certain variables of care have improved, often in relation to a control group. The second category includes studies which attempt to document existence and completeness of an established continuity situation, usually with an implicit assumption that health outcomes are better in this system. In general, measurements have been directed towards the following situations:

1. Continuity of care given to the patient and the family by the provider or health team. This has been measured in terms of patient visits, illness episodes, or as a fraction of scheduled or unscheduled visits.

2. Continuity of care of the total health system, i.e., the investigation of missed appointment rates, number of duplicated tests, procedures and physical examinations, number of sources of care, referral letter return rate, patient dropout rate from screening or preventive programs.

3. Assessment of attitudes toward continuity of care. Patient, staff and physician attitudes have been surveyed following the implementation of continuity plans.

A Proposed Model of Continuity

Continuity is defined in most dictionaries as "an uninterrupted succession," "an unbroken course," or "an un-

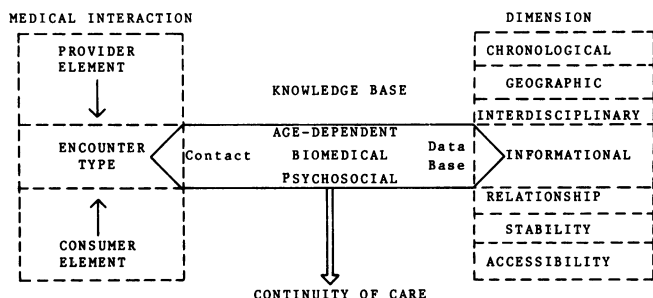


FIGURE 1—Model of Continuity of Care

broken coherent whole.” Applied to medical care, continuity appears to be not only a measurable succession of encounters but an attitude as well.

Continuity is present in a medical encounter when at least one participating element has prior knowledge of the other. The essence of continuity of medical care rests with the information concerning the coherent relationship between provider and consumer. This implies a knowledge of the sequence of a consumer’s contacts with the medical care system.

Continuity is thus conditional upon the amount of prior knowledge possessed by the *elements* involved in medical care. These elements can be subdivided into two types: consumers, who consist of patients, families and possibly larger groups; and providers, who offer health care. In the event of continuity being present, either the consumer or the provider, or both, will possess some degree of prior knowledge of each other and will use this knowledge in an encounter between the two.

The encounter will take place in a situation we have termed “the continuity environment.” This is the basic structure of continuity of care and Figure 1 demonstrates the detailed components of this model. Consumer elements consist of individuals, nuclear families and even larger cohorts of people (schools, industrial units, etc.), while the providers are made up of physicians and nurses, paramedical workers, social workers, etc. The encounter between these elements can be of two kinds, direct or indirect. The direct encounter may occur visually, verbally or by the written word, i.e., face-to-face, through the telephone or via medical records, messages, etc. The indirect encounter uses the same communication method but is undertaken by an intermediary, i.e., a mother discussing her absent child’s problem with a nurse, or a nurse giving the physician a message from a patient.

The knowledge base concerning consumers and providers may be recorded or unrecorded. The latter can be directly acquired by either group or obtained “secondhand” (i.e., reported by others). It is known by practicing physicians that considerable unreported and unrecorded knowledge is available and transmitted in the practice of primary care medicine, although there is no documentation of this fact. The consumer element does not usually possess recorded prior knowledge about the provider, but may have unrecorded first or secondhand knowledge about this person (i.e., a physician’s reputation for kindness, medical skill, willingness to

do home visits, etc.). In contrast, the provider will usually have recorded knowledge concerning the consumer—medical records, hospital summaries, laboratory tests and correspondence (i.e., the script of direct and indirect encounters between the continuity elements). In addition, the provider may have considerable unrecorded knowledge from multiple sources, both first and secondhand. The completeness and use of this knowledge has direct implications on the quality and level of continuity. It can be postulated that the greater the knowledge base, the greater the continuity of care for the consumer.

Encounters occur in the “continuity environment.” The latter is composed of a whole range of environmental factors which affect the quality and level of continuity between the elements. Based on Hennen’s original theme,⁷ this environment is made up of the following dimensions:

The chronological dimension, which includes health services provided to both patients and family over time periods covering life cycle changes and life crises. This implies care for people of all ages and exposes the limitations of continuity for pediatricians and internists. Information about the individual and the family, built up over time, provides “matured” knowledge essential for family diagnosis and patient management as well as a base for scientific study. Longitudinality may affect the continuity and possibly the quality of psychosocial care more than it influences the continuity of biomedical care, by virtue of the extended personal relationship between the consumer and provider.

The geographical dimension, which indicates the site at which care is given. Hennen suggests that continuity is established when one physician provides all medical contact regardless of site, even in the tertiary care center.⁹

The interdisciplinary dimension, which is described as the physician’s ability to step across body system boundaries, manage and integrate a wide range of diseases, and social and behavioral problems as well as those of the patient’s family. It also indicates the consumers’ willingness to seek holistic care from a single source.

The relationship dimension, which includes continuity of the doctor-patient relationship, family relationships, and those connectors who assist the patient through different aspects of the health care system (i.e., paramedical staff, secretaries, receptionists, medical colleagues, and hospital personnel). Within this dimension, the provider may feel a sense of continued responsibility toward the patient, the family, and the community which transcends agreed commitments and working hours.

The informational dimension, which supports the continuity given to patient care by information systems. This relies on adequate medical records indicating episodes of illness, follow-up, management plans, as well as effective telecommunications, good referral systems, and feedback from emergency rooms and hospitals. Implicit is the consumers’ willingness to provide information or indicate appropriate sources from which data may be obtained.

The accessibility dimension, which ensures the continuity established by convenient offices, effective appointment systems, the provision of after hours care, and ease of access to medical advice.

COMPONENT	MEASURABLE UNIT
PROVIDER ELEMENT	PHYSICIAN, PHYSICIAN EXTENDER, NURSE, NURSING AIDE, SOCIAL WORKER, TECHNICIAN, ADMINISTRATIVE STAFF
CONSUMER ELEMENT	INDIVIDUAL PATIENT; NUCLEAR FAMILY, EXTENDED FAMILY, OCCUPATIONAL GROUPS, COMMUNITY GROUPS
ENCOUNTER TYPE	DIRECT: FACE TO FACE (VISUAL AND VERBAL) TELEPHONE (VERBAL) WRITTEN MESSAGE INDIRECT: FACE TO FACE (VISUAL AND VERBAL) TELEPHONE (VERBAL) WRITTEN MESSAGE
KNOWLEDGE BASE	RECORDED: MEDICAL RECORDS, MESSAGES, MICROFICHE, COMPUTER TAPE UNRECORDED: FIRST HAND INFORMATION (MEMORY), SECOND HAND INFORMATION
CONTINUITY ENVIRONMENT	CHRONOLOGY - CARE OVER TIME GEOGRAPHY - SITE OF CARE SPECIALTY - NARROW OR HOLISTIC RELATIONSHIP - BETWEEN PATIENTS, FAMILIES AND PROVIDERS INFORMATION SYSTEM - MEDICAL RECORDS ACCESSIBILITY - SITE OF ACCESS, APPOINTMENT SYSTEMS, ETC. MOBILITY/STABILITY - CONSUMER OR PROVIDER

FIGURE 2—Components of the Continuity Model

The stability dimension, which relates to the stability of the community within which care is provided and the relative stability of the family and individual. It also applies to the stability or mobility of the provider.

Figure 2 consists of a model from which continuity can be measured. It includes the provider element, the consumer element, the encounter type, the knowledge base, and the environment dimension. The ideal direct measure for continuity would be the extent of the knowledge base, but the analysis of other components of the model may be easier to accomplish and probably provides a good indirect measure of continuity of care. These components can be evaluated mathematically, i.e., number of encounters, number of providers involved in the care of a patient or a family, the number of different sites of encounter, aspects of information recorded, etc.

On examining the encounter between the provider and consumer elements, a further complexity arises since the two elements interact with each other at varying and changing levels of intensity of continuity, somewhat as a fire blazes up and dies down. This can be illustrated by the example in which the first and most intense level of continuity is established by the encounter between the patient or the family and their assigned personal physician; the second level of continuity occurs when there is contact between the patient and/or family and a physician from the same medical team. The third level of continuity occurs when a physician

from another medical team with the same medical grouping encounters the patient or family. Levels one and two are situations in which "personal" providers have a high commitment to continuity of care for the individual or family; "Impersonal" providers are those that have a low commitment to continuity of care for the patient and tend to be people who do not feel and do not practice continuing responsibility. They may provide continuity within a narrow field of medicine but usually do not take broad or social responsibilities for the consumers.

In summary, the model consists of five parts: the provider element, the consumer element, the encounter type, the knowledge base, and the environment of continuity, all modified by the level of intensity of continuity.

Discussion

It seems unlikely that continuity can be measured in a global sense, nor can all the dimensions suggested by Hennen be accurately defined.⁷ It is therefore important to select and agree upon specific areas of continuity of care which are easily measured, yet have significance when related to outcome studies. Continuity based on fractions or percentages of patient or family visits to their own physician has been investigated and no judgments have been made as to the appropriateness of these fractions. Breslau and Reeb noted a

continuity index of 0.84 for families in a private pediatric practice (the number of visits with the personal physician divided by the total number of visits to the practice in one year). Expressed as a percentage, this dropped from 84 per cent continuity to 68 per cent after the practice had become a university training program two years later. For well child care, the continuity percentage was high (90 per cent), but for acute illness, it dropped from 73 per cent to 43 per cent after two years. The authors stressed the importance of attempting to provide continuity for acute illness care.¹¹

Aylett, in a study of 45 practices in England, reported that the majority of general practitioners no longer organized their work in order to care for a defined list of patients.²⁵ However, Hill, in Canada, reported that 83 per cent of patients and 86 per cent of family households surveyed had not seen another primary care physician since attending their personal doctor.¹⁵ Continuity with a personal physician is said to occur in 80 per cent of patient visits in General Practice in England.³³ The question of what constitutes satisfactory continuity ratios is therefore unanswered.

Although the proposed definition and "levels" of continuity presented in this paper offer some guide to the quality and measurement of the continuity of care experienced by both the doctor and patient, other qualitative factors exist. Hansen has proposed a scoring system in relation to certain kinds of medical and psychological problems in which continuity may be more important than in others.³⁰ For example, the follow-up of a chronic condition has a high score (important) compared to the continuity score assigned to an injury requiring sutures and minimal follow-up.

In addition to the relevance of varieties of medical and psychological problems, the age group of the population served may also be important. Boyle has shown that patients who return to see their physicians in sequential years tend to be in the older age groups and have a relative abundance of chronic or long term health problems.³⁴ Non-returners tend to have more acute health problems and come from younger adult age groups. It has already been noted that continuity is seen to be important for well child care, so it appears that the two extremes of the life-span are most in need of continuity from the point of view of the consumer.

Wessen has raised the question of the adequate return rate of patients over prolonged periods and recent data cast some gloom over the concept of continuity of care in the chronological dimension as a desirable and attainable entity.³⁵ As noted above, Boyle studied returning and non-returning patients in eight family practice sites (training and community) over a three-year period.³⁴ Of the patients who attended for care in the first year, only 25 per cent returned in the two subsequent years, and 48 per cent of the patients seen in the third year were "new." The practices studied were located in a variety of settings (both urban and rural), so the data would appear to be representative of the visiting patterns of the population where the investigation took place. This implies that whatever the efforts on the part of the provider to give continuity of care, there may be impressive forces of health and social behavior which tend to counteract those efforts. The high mobility of the American population may render the kind of continuity idealized by primary

care physicians an unattainable goal, whereas other societies with more stable populations may be able to achieve good continuity of care. For example, a small study has demonstrated an attrition rate of only 7.5 per cent of all families per year registered with three family physicians practicing in a large Canadian city.³⁶

One of the easier strategies in attempting to measure continuity of care is to select provider continuity, since the activity of providers is easily accessible to analysis. Steinwachs has raised two important points regarding provider continuity.³⁷ First, in order to measure continuity, norms must be defined in relation to specific aspects of medical care (i.e., chronic disease); second, more than one measure is needed to adequately reflect provider continuity in different medical care settings. These measures may be based on simple data collection, on variance or on the probability that continuity of care will occur. The comparison of six methods of measurement, described by Steinwachs, showed a variation in the sensitivity with which continuity is measured, depending on which continuity issue is being examined.³⁷

Continuity of care is multidimensional and will probably require several different approaches both in definition and measurement. The model proposed contains components that can be measured with varying effectiveness. There is a need to define and operationalize the model more accurately in order to establish the value of continuity in primary care medicine.

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