The Ambulatory Sentinel Practice Network: Purpose, Methods, and Policies

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The Ambulatory Sentinel Practice Network (ASPN) is a network of primary health care practices across the United States and Canada offering (1) a laboratory for the study of populations under the care of primary care providers, and (2) surveillance of primary care problems and services. This paper reports the methods and policies developed and used by ASPN to conduct studies and describes the initial sentinel practices.

ASPN (the Ambulatory Sentinel Practice Network) is a network of primary health care practices across the United States and Canada. The network offers (1) a laboratory for the study of populations under the care of primary care providers, and (2) surveillance of primary care problems and services. Such a network may be a key tool in understanding primary care; understanding environmental, psychological, and social determinants of health and disease; containing health care costs; and appropriately preparing primary care providers for practice. The purpose of this paper, co-authored by the members of the ASPN Steering Committee, is to report the methods developed and used by ASPN to conduct studies, review ASPN policies critical to the operation and maintenance of the ASPN network, and describe the sentinel practices as they existed in January 1983.

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Methods and Policies

Governance

ASPN was proposed initially by Dr. Eugene Farley at the 1979 meeting of the North American Primary Care Research Group (NAPCRG). One year later, NAPCRG endorsed the project as important and feasible. The Rockefeller Foundation has provided financial support for the development of this system since November 1, 1981. Many individuals and institutions have volunteered in-kind contributions. An initial steering committee, drawn from the NAPCRG membership, was revised in late 1981 to ensure adequate opportunity for practitioner participation. The revised steering committee met for the first time in Denver, Colorado, in January 1982 and established basic principles and operational policies.

The ASPN Steering Committee is the policy-making body for ASPN. As the policy-making body, the ASPN Steering Committee (1) determines its own membership and operating procedures, (2) determines the purposes of the sentinel practice network and oversees the overall man-

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agement of ASPN, (3) oversees the recruitment and supervision of sentinel practices, (4) establishes criteria and standards for practices participating in ASPN, questions selected for study, and reports of results obtained by ASPN studies, (5) appoints and defines the function of the ASPN Advisory Group, committees, and staff as appropriate to meet project needs, (6) accepts and responds to suggestions from the sentinel practices, the ASPN Advisory Group Project, staff, and others, (7) reports progress and policy to sponsoring institutions, and (8) seeks funding for ASPN.

The ASPN Steering Committee is composed of at least nine members and will include at least two representatives from NAPCRG, at least three representatives from academic institutions, and at least three members who are principally primary health care practitioners. The ASPN Advisory Group is composed of persons who have expressed interest and commitment to the ideas inherent in the project or who have, by virtue of their efforts or expertise, contributed to the project's development. As a prime source of advice and suggestions for ASPN, the ASPN Advisory Group (1) calls events or concerns of relevance to the attention of the ASPN Steering Committee, (2) suggests problems to investigate, and (3) responds, as possible, to requests from ASPN for assistance.

The staff of ASPN consists of a volunteer principal investigator and an executive secretary (half time). The staff are responsible for continuing development of ASPN, implementing ASPN policies, and accomplishing the objectives of grant proposals.

To promote effective communication among the practices and throughout ASPN, the steering committee appointed a group of conveners who are located in geographic proximity to clusters of sentinel practices. These conveners ensure communications among the sentinel practices through personal contact, telephone conversations, conference calls, and group meetings.

The Sentinel Practices

The ASPN Steering Committee established general and specific requirements for participation as a sentinel practice. In general, a sentinel practice has the desire to contribute to new knowledge development in primary care, the dedication to persistently record and report data about patients, and the ability to cooperate with other sentinel practices. All providers within a sentinel practice endorse and support its participation as a sentinel practice. More specifically, a sentinel practice (1) is composed of primary care providers, (2) reports annually, by February 1, an age and sex distribution of the patients seen by the practice in the previous two years (through December 31), (3) collects and reports weekly data about two to four questions defined annually, (4) contributes to the selection of projects, (5) uses standardized definitions and procedures to report and ensure the quality of data, and (6) shares its data for distribution and use in ways that are consistent with the confidentiality requirements of ASPN.

To be designated as a sentinel practice, a practice must meet the general and specific criteria, be nominated by a member of the ASPN Steering Committee, and be appointed by the ASPN Steering Committee. Designation continues only with the mutual consent of the practice and ASPN.

The practitioners in sentinel practices are special, reflected in part through their commitment to ASPN, which requires them to (1) understand the purpose and comply with the policies of ASPN, (2) participate in the conversations and meetings required to conduct studies with rigorous attention to detail, propose questions for study, and nominate other sentinel practices, (3) achieve accurate and complete reporting of data, (4) mail, without prompting, the weekly return for the prior week no later than the subsequent Friday, (5) support and insist on methodological rigor in ASPN projects, including pilot testing in ASPN practices before implementation of any project, (6) provide feedback about projects being tested and conducted in the sentinel practices, and (7) identify one contact person within their practice with whom other sentinel practices and ASPN staff can establish communication.

To begin the network, each steering committee member agreed to recruit three or four practices in his region. Other selection considerations were developed for the initial sentinel practices. These considerations included a preference for full-time practices that have been established for at least two years and that do not serve principally as residency practices. An initial goal of at least 25 practices completing the 1982-1983 studies was set. There are currently 38 sentinel practices located in 14 US states and two Canadian provinces. The

Table 1. Characteristics of ASPN Practices by Practice Location and Number of Providers per Practice

	Number of Practices
Practice Location	
Rural	24
Suburban	6
Urban	8
Number of Providers per Practice	
One	9
Two	8
Three	4
Four	8
Five	6
Six	2
Nine	1

Physicians' assistants are employed in 9 of 39 practices
Nurse practitioners are employed in 6 of 38 practices
Medical students are taught in 29 of 38 practices

Table 2. Estimate of Age-Sex Distribution of Active Patients in ASPN Practices as of January 1, 1983, for 23 (61 percent) Practices Reporting

Age (yr)	Male No. (%)	Female No. (%)
<1	700 (1.0)	655 (0.9)
1-4	2,542 (3.5)	2,222 (3.0)
5-14	5,046 (6.9)	4,711 (6.5)
15-44	14,866 (20.4)	21,996 (30.2)
45-64	4,972 (6.8)	6,335 (8.7)
≥ 65	3,830 (5.3)	4,980 (6.8)
Total	31,956 (43.9)	40,899 (56.1)

steering committee members recruited the initial practices from personal contacts in light of the criteria and these preferences. Subsequent practices are selected from volunteers and nominations from other practices. Each practice completes a registration form that indicates selected practice characteristics. Table 1 summarizes characteristics of the initial sentinel practices.

Of the total number of physician providers (n = 95), 83 are family physicians/general practitioners, 6 practice internal medicine, 1 is a pediatrician, and 5 are in other specialties; the new health providers (n = 24) are nearly equally distributed among nurse practitioners (8), physicians' assistants (9), and other (7). There are more physicians practicing in rural (n = 55) than in nonrural (n = 40) areas, with no significant differences in age, years in practice, or percent of time working. Those in nonrural areas were more likely to be board certified, however (93 percent vs 62 percent for rural areas). When the family physicians/general practitioners from ASPN (n = 77) were compared with members of the AAFP (n = 28, 118),* the ASPN physicians were slightly younger (37 vs 49 years), more likely to be board certified (82 vs 55 percent), and more representative of rural practice (51 vs 35 percent).

As of April 1, 1983, 25 of 38 practices had submitted an age-sex distribution of patients seen in their practices. Of these, 23 could be aggregated into standard groups as shown in Table 2. Figure 1 compares the age-sex distribution of these ASPN patients with the US population.

Feedback to the practices has been identified as central to the success of ASPN. Personal communication among practices, conveners, and ASPN staff is critical. A newsletter is circulated at least eight times each year. Principal investigators and steering committee members also provide periodic reports to the practices concerning progress of the various studies. Prior to each meeting of the steering committee, each practice is solicited for expression of any concerns or questions to be included on the agenda of the steering committee meeting. All practices are encouraged to contribute to the newsletter and to call the ASPN executive secretary directly with any immediate problems. Bidirectional communication is crucial.

Sentinel practices are acknowledged in any publication concerning an ASPN project by name as an acknowledgment accompanying the paper or by specific reference to another publication in which each contributing practice is named.

Selection of Questions for Study

Anyone can propose a study. Suggestions from the sentinel practices, advisory group, and the

*Analysis of data base on active academy members as of April 7, 1980

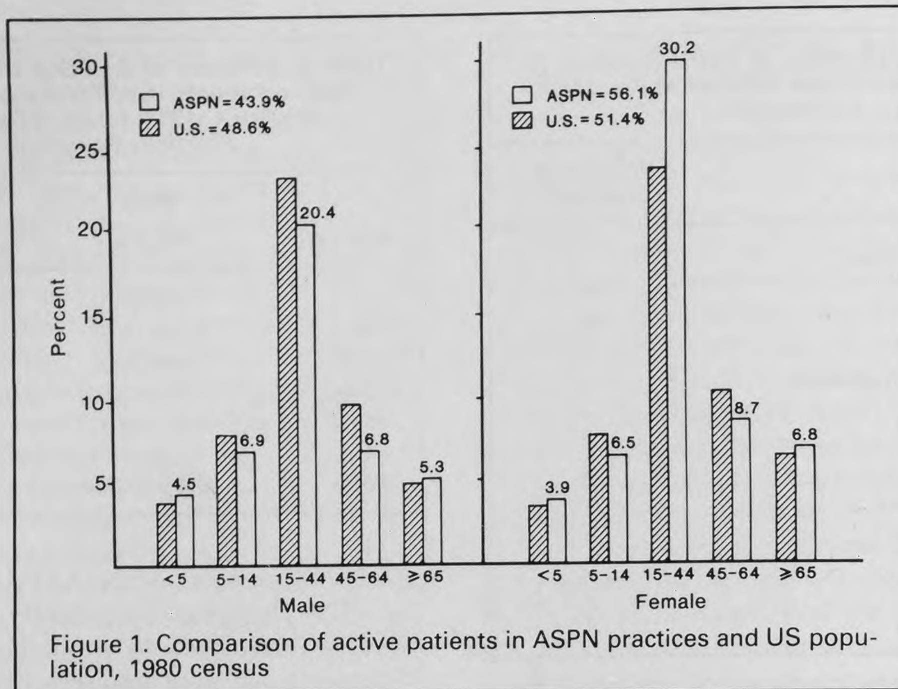

Figure 1. Comparison of active patients in ASPN practices and US population, 1980 census

steering committee are actively solicited. The steering committee decides what studies are developed. To guide selection of studies, the steering committee adopted the following criteria:

Absolute

1. Is relevant to the well-being of patients or primary care providers
2. Has strict criteria that can be formulated
3. Is not too time-consuming for the practices
4. Encourages practice participation rather than the loss of practices from the system
5. Is of adequate importance to attract support and funding
6. Has no approach preferable to ASPN that is recognized
7. Has an identified principal investigator

Relative

1. Has potential for impact on public policy
2. Has potential for impact on development of research in primary care
3. Builds on existing knowledge
4. Addresses a knowledge vacuum
5. Can combine psychological and biomedical questions for the same subject

The ASPN Steering Committee selects two to four studies each year, and immediately upon selection appoints a principal investigator for each study. The principal investigator is responsible for the planning and overall conduct of each study and the final preparation for publication of project results.

Data Management

Approval of a study is a two-step process with the steps separated by the designation of a principal investigator and satisfactory development of the study. This development must include a relevant literature search and refinement of questions and definitions of all terms. Consideration is also given to the importance of the questions or hypotheses and why ASPN should address them as well as determination of the data collection required and implications for form design. Trial applications in one or two practices precede formal pilot studies, which lead to a final version of the questions and reporting format. The data required for individual studies are collected on a pocket-sized form called the "weekly return," which was modeled after a form developed by the sentinel stations of the Netherlands.

Once the weekly return is designed, data collection can begin. The weekly return is mailed to the executive secretary of ASPN in Denver, Colorado, where it is immediately checked for completeness, legibility, and compliance with

instructions. Any deficiencies are corrected by direct contact with the practice. On Monday morning all weekly returns received the previous week are delivered by hand to the University of Colorado Health Sciences Research Center, where they are keypunched following standard operating procedures. All weekly returns from any previous weeks are collected and returned to the ASPN office and secured.

All terms and abbreviations appearing on the weekly return are carefully defined, and a reference list is prepared for each practice. Instructions for the completion of the form are organized into instructions specific for each study and the following general instructions.

The sentinel practices report the total number of ambulatory direct encounters conducted by the providers in the practice during each week. Each practice also reports weekly the availability of its services by marking the portion of each day (morning, afternoon, night) that patients were receiving care from providers reporting about patients in ASPN studies. For all patients meeting the study criteria, the practice records the patient's name, identifier, and birthdate. The patient's full name as registered in the practice, one per line, is recorded on a detachable stub. When recording is completed for the week, the stub is detached, retained, and secured in the practice. Thus, the practice and only the practice is able to identify by name the patients about whom the report is provided. Self-addressed, stamped envelopes are provided for each practice for each week. Each practice is invited to call ASPN collect at any time for clarification.

Quality Assurance

The quality assurance policy of ASPN focuses upon estimating the accuracy, appropriateness, and completeness of recording and reporting by the entire network, not individual providers or practices. Accuracy and appropriateness are assessed by comparing information reported on the weekly return with information recorded in the medical records of patients receiving care in ASPN practices. Completeness of reporting is assessed by examining randomly selected records to determine whether encounters meeting inclusion criteria were actually reported on the weekly return. Sample sizes are calculated using standard methods, including a multinomial correction factor, and an adequate sample is examined to allow estimate of errors with 95 percent confidence.

Keypunching and data processing are subject to the methods used by the University of Colorado Research Center. The principal investigators and staff at the research center collaborate to analyze reported data. Results are then presented to the ASPN Steering Committee, which is responsible for the publication of results and for the soundness of any conclusions.

The collaborative nature of ASPN means that the results are not the property of any one center or any one individual but belong to all involved and should be published under the aegis of ASPN. There is no publication by individual recorders or groups of recorders unless this is approved by the steering committee.

Other Key Issues

Consent and Confidentiality

ASPN accepts the definition of medical research involving human subjects established by the World Health Organization, ie, "any proposal related to human subjects, including healthy volunteers, that cannot be considered as an element in accepted medical management or public health practice, and that involves either: (a) physical or psychological intervention or observation, or (b) collection, storage and dissemination of information relating to individuals." Therefore, ASPN accepts responsibility to adhere to carefully considered consent and confidentiality policies.

The ASPN Steering Committee has adopted the following principles as policy:

1. Reconsideration of the policies for confidentiality and informed consent is expected; suggestions or concerns by anyone are welcome at any time.
2. It is the responsibility of the individual recorders and the principal investigators to ensure the confidentiality of individual patient data reported to ASPN.
3. Patient anonymity must always be protected. Any information transmitted to ASPN must not include data that would allow the patient to be identified by anyone other than the patient's provider.
4. If it is necessary to identify the patient to review the patient's record, the patient will be identified by a code that can be linked to the spe-

cific patient by a key retained only by the ASPN provider at her or his own practice site and under her or his absolute control.

5. All data collection forms will show site and patient identifiers as numeric or alphanumeric codes.

6. Published National Institutes of Health guidelines will be followed, including the following: Confidentiality of data must be maintained in two areas: forms received from centers and data on computer or in computer-readable format. Forms will be available only to authorized personnel as needed. The forms will be kept in secured files overnight when not in active processing. There will be no permanent computer file linking name or social security number with clinical data. Files containing the clinical information reported by practice and individual will not be stored permanently on the computer but will be maintained on tapes or discs to be read into the computer as needed for processing. When not being used, computer tapes or discs will be either in the possession of authorized personnel or in secured files.

ASPN publishes no information linked to specific practices without the written consent of the affected practice.

Long-Term Working Relationship With Practices

It is obviously desirable to build on experience and sustain interest in the sentinel practices to allow longer term studies, comparison of data in different years, and the maintenance of person-oriented data sets. A group of physicians scattered from coast to coast were asked to identify the key issues required to recruit and retain sentinel practices. The key issues identified are (1) there must be a firm sense of joint participation, (2) there must be predictable feedback to participating practices and the feedback should relate to practice, (3) reporting formats must be simple and not disrupt practice, and (4) the practices cannot be expected to fund data collection unnecessary for practice.

Three Limitations of ASPN Methods

The representativeness of the patients and the providers in sentinel practices is not established; therefore, the ability to generalize results from ASPN surveys, studies, and comparisons to other studies is not established.

Since a totally adequate and proven means of estimating the populations at risk in sentinel practices has yet to be identified, population-based incidence and prevalence rates cannot be determined. Therefore, ASPN reports incidence and prevalence proportions.

ASPN has not determined the stability and longevity of sentinel practices remaining in ASPN, of individual physicians remaining in their practices, or of individual patients remaining with their provider. Thus, the feasibility of studies involving extended observation is unknown.

Performance to Date

After four years of development, data collection was begun November 1, 1982. The first three ASPN studies concern pelvic inflammatory disease, headache, and spontaneous abortion. During the first three months of study, sentinel practices reported for 505 of 510 potential weeks (99 percent) and only 47 (7 percent) of the weekly returns needed revision. The sentinel practices reported a total of 77,431 encounters of which 1,351 (1.7 percent) were for headache, 252 (0.3 percent) were for pelvic inflammatory disease, and 42 (0.5 percent) were for spontaneous abortion. The availability of sentinel practices for reporting to ASPN ranged from 63 percent on Sunday mornings to 98 percent on Monday afternoons.

ASPN has made the transition from an idea to a functioning network of practices providing a rich resource for primary care research and surveillance. The future of ASPN depends upon the firm participation of the sentinel practices in all aspects of the network and further development of networking methods and resources.

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