

**CONTROL OF *NEISSERIA GONORRHOEAE*
INFECTION IN THE UNITED STATES**

**REPORT OF AN EXTERNAL CONSULTANTS' MEETING
CONVENED BY THE DIVISION OF STD PREVENTION,
NATIONAL CENTER FOR HIV, STD, AND TB PREVENTION,
CENTERS FOR DISEASE CONTROL AND PREVENTION (CDC)**

October 10-11, 2001

Meeting coordinators (Division of STD Prevention, National Center for HIV, STD, and TB Prevention, CDC): Kimberley K. Fox, M.D., M.P.H. and John Moran, M.D.

External consultants: Virginia Caine, M.D., Marion County Health Department, Indianapolis, IN; Carol Ciesielski, M.D., Chicago Department of Health, Chicago, IL; Jacqueline Darroch, Ph.D., Alan Guttmacher Institute, New York, NY; Carlos del Rio, M.D., Emory University, Atlanta, GA; Geoffrey P. Garnett, Ph.D., Imperial College of Science Technology and Medicine, London, United Kingdom; King K. Holmes, M.D., Ph.D., University of Washington, Seattle, WA; Peter A. Leone, M.D., University of North Carolina, Chapel Hill, NC; David Martin, M.D., Louisiana State University, New Orleans, LA; William McCormack, M.D., State University of New York, Brooklyn, NY; John J. Potterat, Colorado Springs, CO; Michael Ross, Ph.D., University of Texas, Houston, TX; Richard Rothenberg, M.D., Emory University, Atlanta, GA; Karla Schmitt, Ph.D., M.P.H., Florida Department of Health, Tallahassee, FL; Lydia A. Shrier, M.D., M.P.H., Harvard University, Boston, MA; William L.H. Whittington, University of Washington, Seattle, WA; Jonathan M. Zenilman, M.D., Johns Hopkins University, Baltimore, MD. **Moderators:** Myron S. Cohen, M.D., University of North Carolina, Chapel Hill, NC; Edward W. Hook, III, M.D., University of Alabama, Birmingham, AL; Peter A. Rice, Boston University, Boston, MA; P. Frederick Sparling, M.D., University of North Carolina, Chapel Hill, NC. **Rapporteurs:** Gail Bolan, M.D., California Department of Health, Berkeley, CA; Robert A. Gunn, M.D., San Diego Department of Health, San Diego, CA; H. Hunter Handsfield, M.D., University of Washington and Public Health-Seattle & King County, Seattle, WA.

Meeting participants from the Division of STD Prevention, National Center for HIV, STD, and TB Prevention, CDC: Donna Anderson, Ph.D.; Sevgi Aral, Ph.D.; Roxanne Barrow, M.D., M.P.H.; Stuart Berman, M.D., Sc.M.; Susan Delisle, R.N., M.P.H.; Linda Dicker, Ph.D.; Thomas L. Gift, Ph.D.; John Glover; Dorothy Gunter, MPH; Matthew Hogben, Ph.D.; Kathleen Irwin, M.D., M.P.H.; Robert Johnson, M.D.; Lauri Markowitz, M.D.; Debra Mosure, Ph.D.; Lori Newman, M.D.; Jack N. Spencer; Janet St. Lawrence, Ph.D.; Susan A. Wang, M.D., M.P.H.; Hillard Weinstock, M.D.; Kimberly A. Workowski, M.D.

Meeting participants from the Division of AIDS, STD, and TB Laboratory Research, National Center for Infectious Diseases, CDC: David Trees, Ph.D. and Joan S. Knapp, Ph.D.

Meeting logistics manager (Division of STD Prevention, National Center for HIV, STD, and TB Prevention, CDC): Donald Dowda

This report was prepared by Kimberley K. Fox, M.D., M.P.H.

**CONTROL OF *NEISSERIA GONORRHOEAE* INFECTION IN THE UNITED STATES:
REPORT OF AN EXTERNAL CONSULTANTS' MEETING**

INTRODUCTION

Gonorrhea is one of the most common reportable diseases in the United States. Untreated gonorrhea in women can result in pelvic inflammatory disease and subsequent infertility, ectopic pregnancy, and chronic pelvic pain. In addition, substantial evidence suggests that gonorrhea facilitates the transmission of HIV infection in both men and women. Following the implementation of a national gonorrhea program, rates of gonorrhea in the United States declined fairly steadily from 1975 to 1997. From 1997 to 2001, the overall gonorrhea rate has increased by more than seven percent.

With recognition of this reversal in gonorrhea trends, the Centers for Disease Control and Prevention's (CDC) Division of STD Prevention convened an experts' consultation to discuss challenges and new directions for gonorrhea control. The meeting on October 10-11, 2001 involved 24 participants from CDC and 22 external consultants who had expertise in the biology and epidemiology of *Neisseria gonorrhoeae*, clinical services for gonorrhea, and gonorrhea prevention. The meeting was organized around three workgroups which addressed five areas: screening, partner services, prompt entry into health care, effective treatment, and behavior change. Workgroups developed recommendations for gonorrhea prevention activities and research priorities based on discussion in each of these areas. These were organized and sent back to meeting participants to rank in terms of priority (high, medium, or low). Priority rankings were to reflect perceived public health impact and feasibility.

This report presents the recommendations and priority rankings of the consultants and is organized according to the following topics: surveillance and screening, partner services, health care access and utilization, quality of care and effective treatment, and sexual behavior change and other interventions for high-risk networks. For each topic, the report contains a summary of workgroup discussion, general principles developed by the consultants, and recommendations for prevention and research activities. The principles are broad statements regarding the goals or general organization of gonorrhea prevention services. Recommendations provide more specific guidance for prevention and research activities. The recommendations are directed at a broad audience of organizations and persons working in STD prevention; some recommendations specifically identify activities appropriate for CDC or for local STD programs. Each principle or recommendation is followed by the average priority rating (low, medium, or high) given to it and the degree of consensus (low, moderate, or high) with regard to the rating. Specific areas of disagreement among the consultants are noted where appropriate.

Consultants recommended several innovative programmatic activities be implemented and accompanied by research to more fully determine the effectiveness or optimal methods for the activity. Consultants stressed the importance of developing and evaluating new approaches to gonorrhea control. It should be noted that many research priorities are being addressed, at least in part, by ongoing research; these research issues are listed here to indicate the consultants' support for continued or additional work in these areas. Some recommendations contained in this report are not specific to gonorrhea prevention, and address STD prevention broadly. The interrelated nature of prevention for gonorrhea and other STDs necessitates this broad approach.

SUMMARY OF HIGH PRIORITY RECOMMENDATIONS FROM THE WORKGROUPS

The following recommendations from the workgroups were rated high priority, with a high degree of consensus among the consultants. Complete recommendations, with discussion, are provided in the next section of this document.

I. SURVEILLANCE AND SCREENING

Principles

- ▶ **High quality surveillance data are needed to accurately define and monitor trends in gonorrhea.**
- ▶ **Screening for gonorrhea in settings other than STD clinics should be focused on persons at high risk for infection, using screening algorithms based on the local epidemiology of gonorrhea.**
- ▶ **Gonorrhea screening activities should take place not only in health department clinics but also in private clinical settings and in non-clinical venues frequented by persons at risk for gonorrhea.**
- ▶ **Gonorrhea screening activities should be linked to chlamydia screening activities where appropriate.**

Recommendations for Prevention Activities

- ▶ **CDC should develop national screening guidelines to be used as a framework for the development of locally-appropriate screening criteria, and as guidance for areas or settings without local screening criteria.**
- ▶ **State and local STD programs should conduct prevalence monitoring for gonorrhea in high-risk population groups.**
- ▶ **Urine and self-obtained vaginal swabs should be used for screening tests for *N. gonorrhoeae* in settings and for persons at risk in whom more invasive specimen collection is impractical.**

Recommendations for Research Activities

- ▶ **Studies of selective screening criteria for gonorrhea should be performed.**
- ▶ **The yield and cost-effectiveness of re-screening persons with gonorrhea should be determined.**

II. PARTNER SERVICES

Recommendations for Prevention Activities

- ▶ **CDC should develop models for partner services in various settings, including models for private providers referring clients to the health department for partner elicitation and notification.**

III. HEALTH CARE ACCESS & UTILIZATION

Principles

- ▶ **Existing barriers to care, whether geographical, temporal, financial, logistical, sociological or legal, should be reduced.**
- ▶ **STD programs should collaborate with other organizations and agencies serving clients at risk for STDs to ensure that STD clinical and preventive services are available to these clients.**

Recommendations for Prevention Activities

- ▶ **STD programs should evaluate the local accessibility and utilization of STD care for persons at high risk for gonorrhea.**

Recommendations for Research Activities

- ▶ **Develop and evaluate novel strategies for screening and treatment outside of clinic settings.**

IV. QUALITY OF CARE & EFFECTIVE TREATMENT

Principles

- ▶ **Programs should assure appropriate treatment of persons with gonorrhea.**
- ▶ **Surveillance of antimicrobial resistance is critical to ensuring the appropriateness of treatment recommendations.**

Recommendations for Prevention Activities

- ▶ **CDC should develop a policy document setting standards for STD care, including diagnostic testing and partner management, that is applicable to non-health department clinical settings.**
- ▶ **Programs should improve the quality of STD care by educating public and private providers about STDs, emphasizing the importance of risk assessment, screening, prompt treatment, partner management, and prevention counseling.**
- ▶ **Policies should be implemented to ensure that STD risk assessment, risk-reduction counseling, screening, and initiation of partner services are reimbursable services in the private sector and, where applicable, the public sector.**

- ▶ **CDC should continue to support and consider expanding the Gonococcal Isolate Surveillance Project (GISP).**

V. SEXUAL BEHAVIOR CHANGE & INTERVENTIONS FOR HIGH-RISK NETWORKS

Principles

- ▶ **Interventions targeting persons at high risk for acquiring and transmitting gonorrhea, known as core group members, offer the potential to be far more effective in reducing community transmission of disease than interventions targeting persons at lower risk.**

Recommendations for Prevention Activities

- ▶ **HIV-infected persons should receive periodic risk assessments, behavioral counseling, and STD screening.**

COMPLETE RECOMMENDATIONS FROM THE WORKGROUPS

I. SURVEILLANCE & SCREENING

Workgroup Discussion

Surveillance and screening were discussed together because of the considerable overlap of these areas in gonorrhea prevention activities. Screening permits prevalence monitoring—a form of surveillance data—and plays an important role in case finding, especially among women. Surveillance for antimicrobial resistance was discussed in the context of effective treatment, and is covered in this report in section IV, “Quality of Care & Effective Treatment.”

Screening was seen by the workgroups as a key strategy. All workgroups emphasized that screening should be targeted based on the local epidemiology of gonorrhea. Even though overall prevalence in areas may be low, there may be subpopulations with high prevalences of gonorrhea; similarly, within high-prevalence areas, there are groups at low risk for disease.

Diagnostic testing of persons with symptoms suggestive of gonorrhea, permitting appropriate treatment, is important for controlling transmission and preventing complications. Screening—testing of asymptomatic persons—is assumed to play a major role. The consultants agreed about the importance of screening asymptomatic females to prevent complications such as pelvic inflammatory disease and its sequelae, as well as to prevent transmission. However, consultants noted the lack of evidence-based screening criteria for women which address the differences in prevalence across populations.

There was disagreement about the utility of screening asymptomatic males in order to interrupt transmission or prevent complications in either men or women. Some consultants believed that asymptomatic or subclinical urethral infection in males is important in maintaining the community prevalence of disease, while others argued that changes in the epidemiology of gonorrhea and in test technology require revisiting this issue. Gonococcal strains associated with asymptomatic urethral infection now appear to be rare in some areas of the country, possibly reducing the importance of asymptomatic infections. Geographic variation in the prevalence of strains associated with asymptomatic infection may result in local variation in the importance of asymptomatic men with regard to transmission. However, the epidemiology of specific strains of *N. gonorrhoeae* in the U.S. has not been systematically studied outside of a few geographic areas. In addition, although the sensitivity of nucleic acid-based tests and culture are similar for gonorrhea, either test may detect some infections not identified by the other. If the infections identified by one technology and not the other are different in their clinical expression or transmission efficiency, then changes in testing technologies may impact the effectiveness of screening programs; awareness of this issue should inform screening approaches.

There was lack of consensus over the role of gonorrhea screening in correctional settings, especially where prevalence is low. Screening in emergency departments is also variable in yield. There was also uncertainty about the importance of screening in drug treatment facilities, due to heterogeneity in the populations and the accessibility of some substance users in other settings such as correctional institutions. There was limited enthusiasm for targeting commercial sex workers for screening because of the populations’ heterogeneity, the transient nature of commercial sex work, and difficulty in accessing sex workers. In addition, some commercial sex workers are readily accessed in other settings such as correctional institutions and substance abuse treatment facilities. However, several consultants noted that sex workers may be sufficiently important in gonorrhea transmission to warrant focused screening efforts.

Principles

- ▶ **High quality surveillance data are needed to accurately define and monitor trends in gonorrhea.** (High priority, high degree of consensus)

- ▶ **Screening for gonorrhea in settings other than STD clinics should be focused on persons at high risk for infection, using screening algorithms based on the local epidemiology of gonorrhea.** Screening algorithms should take into consideration both client risk factors and prevalences in local geographic areas, specific venues and among defined populations. Groups to be considered for routine screening include: adolescents; MSM; HIV-infected persons; persons with previous episode(s) of gonorrhea; sex workers; and persons entering correctional institutions, especially in high-prevalence areas. However, research is necessary to refine the priority groups for gonorrhea screening. (High priority, high degree of consensus)

- ▶ **Gonorrhea screening activities should take place not only in health department clinics but also in private clinical settings and in non-clinical venues frequented by persons at risk for gonorrhea.** Clinical sites to consider for focused screening include family planning clinics, prenatal clinics, private providers located in areas of high prevalence or serving high-risk populations, school-based clinics, HIV testing sites, and emergency departments. Non-clinical sites to consider for focused screening include correctional institutions (juvenile and adult), teen shelters, community centers, bars, bathhouses, and even street corners where high risk persons (particularly youths in the same sexual network) may congregate. Screening in these locations should supplement screening in public STD clinics. Decisions about screening in such settings must take into account yield, ease of implementation, and processes for providing therapy to persons found to be infected. Mapping of reported cases may be useful in identifying areas for screening activities. Mobile vans may be useful to implement screening in non-clinical venues; however, to diminish stigma and to enhance appeal and impact, in some settings it may be most effective to integrate other services with STD services. (High priority, high degree of consensus)

- ▶ **Gonorrhea screening activities should be linked to chlamydia screening activities where appropriate.** Given the substantial overlap in populations at risk, this may allow the most efficient use of screening resources. However, gonorrhea screening is not necessary in all populations targeted for chlamydia screening; local epidemiology must be examined to determine when it is appropriate to link these activities. (High priority, high degree of consensus)

Recommendations for Prevention Activities

- ▶ **CDC should develop national screening guidelines to be used as a framework for the development of locally-appropriate screening criteria, and as guidance for areas or settings without local screening criteria.** General guidelines according to age and risk factors should be developed, taking into consideration research studies of selective screening criteria. Guidelines will likely require different screening approaches at various prevalence levels, so prevalence thresholds for these activities should be defined. These guidelines should provide for consistent screening approaches across organizations. Feasibility and implementation issues must be considered in developing these guidelines. Tools for developing specific criteria based on local data would facilitate use of these guidelines by local programs. While screening criteria based on local data are preferred, the development of local screening criteria is not

practical for all areas or settings. Therefore, national screening guidelines should provide general recommendations for screening in situations where local data or locally-derived criteria are unavailable. (High priority, high degree of consensus)

- ▶ **State and local STD programs should conduct prevalence monitoring for gonorrhea in high-risk population groups.** Prevalence monitoring is a screening activity which provides surveillance data on the prevalence of infection in selected populations. The selection of population groups and locations for prevalence monitoring should depend on the local epidemiology of gonorrhea. Data elements from prevalence monitoring should document clinical and behavioral information, and may be augmented by available information on social context. Laboratory databases should also be examined if possible, since many laboratory databases allow calculation of positivity rates and may contain additional demographic and/or clinical information. In high-prevalence areas, where feasible, sites which conduct gonorrhea screening should report at least summary data on prevalence to allow for monitoring of prevalence trends. Whenever possible, line-listed prevalence monitoring data are preferred, to allow monitoring of specific characteristics of both infected and uninfected persons. (High priority, high degree of consensus)
- ▶ **Urine and self-obtained vaginal swabs should be used for screening tests for *N. gonorrhoeae* in settings and for persons at risk in whom more invasive specimen collection is impractical.** Examples of appropriate settings and populations for these tests include non-clinical settings, such as street outreach or homeless shelters; adolescents or others reluctant to undergo genital examination; and persons undergoing rescreening when a genital examination is not otherwise necessary. (High priority, high degree of consensus)
- ▶ **In most areas, universal screening for gonorrhea should be standard for clients attending STD clinics or receiving designated STD clinical services.** Selective screening of STD clinic clients may be appropriate in areas with low rates of gonorrhea. (High priority, moderate degree of consensus)
- ▶ **Women treated for gonorrhea should be screened to detect reinfection, approximately 3-6 months after initial treatment.** Men with gonorrhea may also merit screening for reinfection, but supporting data are more limited. Consultants supported additional testing for chlamydial infection when rescreening persons for gonorrhea. (High priority, moderate degree of consensus)
- ▶ **Surveillance data elements for case reporting should be expanded beyond age, sex, race, and ethnicity, at least for a sample of cases.** Such data elements should include demographic, geographic, clinical, behavioral, or sociocultural characteristics which are important in the local epidemiology of gonorrhea. Examples include age and gender of sexual partners, anatomic site of infection, test type, treatment given, and additional categories of ethnicity or language. The expanded variables may be collected on a sample of cases where broader collection is not feasible. Surveillance data should include the information necessary to identify (at the local or state level) persons with repeat infection. The optimal interval to define repeat infection has not been clearly identified. Various systems, which may not necessarily use names as identifiers, may be used to achieve this goal. Interventions for persons with repeat STDs may be facilitated by having a registry. (Medium priority, moderate degree of consensus)

- ▶ **In low prevalence areas, gonorrhea case reports should include data on the source of infection (both “who” and “where”) to allow prompt recognition of changes in the epidemiology of disease.** Case interviews may be useful for obtaining information on sexual partner characteristics, partner recruitment venues, and other information relevant to understanding the source of infection. (Medium priority, low degree of consensus)

Recommendations for Research Activities

- ▶ **Studies of selective screening criteria for gonorrhea should be performed.** These studies should include consideration of cost-effectiveness and population prevalence, and should be performed in a variety of populations and venues. A prevalence below which screening would not be recommended should be identified. Mathematical modeling may be useful for addressing some of these questions. Studies should include the development and evaluation of risk assessment procedures for use by clinicians. These studies should inform the development of national screening guidelines. Some consultants recommended that prevalence monitoring for gonorrhea be similarly evaluated, including consideration of the data elements that should be collected in prevalence monitoring activities. (High priority, high degree of consensus)
- ▶ **The yield and cost-effectiveness of re-screening persons with gonorrhea should be determined.** This issue should be examined for men and women, for low- and high-prevalence settings, and with consideration of various operational settings and re-screening intervals. (High priority, high degree of consensus)
- ▶ **The sensitivity and specificity of nucleic acid-based tests (probes and nucleic acid amplification tests [NAATs]) for asymptomatic urethral gonorrhea in men should be further examined.** Additionally, the role of confirmatory testing should be defined. The specificity of nucleic acid-based tests must be considered when developing policies for screening, especially in low-prevalence populations. (High priority, moderate degree of consensus)
- ▶ **The importance of asymptomatic and subclinical male urethral infection in transmitting gonorrhea should be examined.** This will require examination of the prevalence and natural history of asymptomatic infection in males and the transmissibility of asymptomatic as compared to symptomatic infection. Studies should determine the fraction of gonorrhea cases which are attributable to transmission from asymptomatic infection and the importance of this fraction in continued transmission. The characteristics of asymptomatic infections detected only by nucleic acid-based tests (with negative culture) are of particular interest. (High priority, moderate degree of consensus)
- ▶ **The performance of NAATs for *N. gonorrhoeae* on rectal and pharyngeal specimens should be evaluated.** Published data on the performance of NAATs on rectal and pharyngeal specimens are limited. Cross-reaction of some *N. gonorrhoeae* NAATs with other *Neisseria* species has been reported, and this cross-reaction may limit the usefulness of these tests on pharyngeal specimens. (Medium priority, moderate degree of consensus)
- ▶ **The impact that discontinuing screening would have on the prevalence of gonorrhea in a community should be examined.** Preliminary work on this issue could be done through

mathematical modeling. This work may help identify what kind of monitoring, if any, should be conducted where prevalences are not high enough to justify even selective screening. (Medium priority, low degree of consensus)

- ▶ **The degree to which gonorrhea is underdiagnosed and underreported should be determined.** Recent data on underreporting of gonorrhea are very limited. (Medium priority, low degree of consensus)
- ▶ **Gonorrhea prevalence in the general population in various geographic areas should be measured.** A recently published study found a prevalence of 5.3% in a probability sample of households in one major U.S. city.* However, the applicability of those results to other geographic areas is unknown, and data from broader geographic areas are needed to better define the epidemiology of gonorrhea. This is a low priority for further research because NHANES IV is currently collecting gonorrhea prevalence data. (Low priority, moderate degree of consensus)

II. PARTNER SERVICES

Workgroup Discussion

All workgroups stressed the importance of conceptualizing partner services broadly, not limiting activities to traditional partner notification approaches. While emphasizing the importance of ensuring partner treatment, many consultants questioned the utility of traditional partner notification through health department staff, i.e., Disease Intervention Specialists (DIS), for controlling gonorrhea. The potential feasibility and effectiveness of DIS intervention in controlling gonorrhea is limited by the high number of gonorrhea cases relative to number of available staff and the labor-intensive nature of DIS intervention.

Various approaches were suggested as alternatives to traditional partner notification. Patient referral of partners was seen by many consultants as a reasonable alternative. Consultants emphasized the importance of approaches that integrate partner services with other prevention strategies, and that address a social or sexual network rather than focusing solely on identified sexual partner(s) of infected persons. Treatment of partners through a variety of approaches, without requiring examination and diagnostic testing, may prove useful, particularly for hard-to-reach population groups. It will be important to systematically assess the legal and structural impediments to such innovative approaches. The importance of maintaining confidentiality while providing partner services, especially with regard to adolescents, and of assessing safety with regard to intimate partner violence were also noted as key issues in assuring proper partner management. Motivating private providers and the health systems in which they work to address partner services was seen as a challenge and a need.

The consultants noted that adolescents with gonorrhea may have particular need for assistance in contacting sexual partners. Coordination of partner management with clinical care was recognized as important, and provider referral may be the best approach for this group.

Assuring treatment of partners of MSM with gonorrhea may present a challenge since some MSM report high numbers of partners, many of whom are anonymous. There was agreement that reluctance to identify partners often results in misclassification of partners as anonymous. It was

* Turner CF et al. Untreated gonococcal and chlamydial infection in a probability sample of adults. JAMA 2002;287:726-733.

hypothesized that approaches to provide prevention services to sexual networks of MSM may be more effective than attempts to identify and provide services to named partners. Virtual venues (e.g., internet, telephone chat lines) may be as important as physical venues (e.g., bathhouses, bars, clubs) in identifying members of sexual networks.

Principles

- ▶ **STD programs should have systems to monitor and facilitate partner treatment.** All potentially exposed sexual partners (within the 60-day interval preceding diagnosis or most recent sex partner if last intercourse >60 days before diagnosis) should be notified and treated; various methods to achieve this objective may be effective. Active provider or staff involvement in ensuring partner treatment should focus on partners least likely to receive treatment without such involvement. (High priority, moderate degree of consensus)
- ▶ **Additional resources are needed to provide effective partner services.** Federal, state and local authorities should allocate more resources for partner services. Several consultants recommended that new resources be directed to new approaches for partner management. (High priority, moderate degree of consensus)

Recommendations for Prevention Activities

- ▶ **CDC should develop models for partner services in various settings, including models utilizing private provider referral of clients to the health department for partner elicitation and notification.** (High priority, high degree of consensus)
- ▶ **Develop selective partner management criteria for cases reported from the public and private sectors and provide intensive follow-up for selected clients and partners.** Priority clients should include those most likely to transmit infection and those at high risk for adverse sequelae of infection. Priority groups may include adolescents, core group members such as persons with repeat STDs, pregnant women, and those with PID, taking into consideration the local epidemiology of gonorrhea. In addition, giving high priority to HIV-infected persons may be particularly important given the role of gonorrhea in facilitating HIV transmission. A variety of strategies, not limited to traditional provider referral, may be used to deliver partner services to these clients. (High priority, moderate degree of consensus)
- ▶ **STD programs should provide training about partner services to selected private providers serving high-risk populations or reporting large numbers of gonorrhea cases.** Training should include the importance of and methods for ensuring partner therapy, and should promote understanding of the role of the health department in delivery of partner services. (High priority, moderate degree of consensus)
- ▶ **Policies and procedures should be developed for ensuring appropriate management of a client's sexual partners when they do not have health care coverage or are not in the same health plan as the client.** Partner treatment should be seen as essential to client care, in order to prevent reinfection. One approach is to ensure that health plans provide for or reimburse the care of out-of-plan partners. Compensation for partner care may include coverage of partner-delivered therapy where this strategy is used. (High priority, moderate degree of consensus)
- ▶ **STD programs should make written materials about partner services available to clients**

through public and selected private providers. Such materials should explain the importance of partner services and provide guidance on notifying partners, to encourage client involvement in effective partner referral. These materials may also include written materials for the client's sexual contacts, providing information and encouraging the partner to seek services. (Medium priority, low degree of consensus)

Recommendations for Research Activities

- ▶ **Examine the feasibility, acceptability, cost and impact of several methods of partner management for gonorrhea (provider referral, patient referral, expedited therapy without clinical assessment, or mixed models).** Partner management methods appropriate to the private sector should be included, and specific population subgroups at risk for gonorrhea should be considered separately. Methods of expedited therapy without clinical assessment include patient-delivered partner therapy, treatment of unexamined partners through cooperating pharmacies, and therapy delivered by health department staff outside of a clinical setting. Evaluation of these strategies also requires assessment of safety. Some consultants cautioned, however, that examination of such strategies must consider the lost opportunity to test for other STDs and counsel in those instances when clinic visits would not be utilized. Results from partner management studies, some of which are currently ongoing, are needed before specific recommendations on approaches to partner management and selective partner management criteria can be made. The relative benefit of active partner management for symptomatic vs. asymptomatic patients is of particular interest. New approaches to evaluation of partner management methods are needed. (High priority, moderate degree of consensus)

- ▶ **CDC should examine structural and legal barriers to practices such as patient-delivered partner therapy and other non-traditional partner services, and to provision of STD test results to patients by telephone.** Addressing structural and legal barriers may be critical to implementing such potentially effective strategies. (High priority, moderate degree of consensus)

III. HEALTH CARE ACCESS & UTILIZATION

Workgroup Discussion

The workgroups discussed several barriers to STD care: lack of symptom recognition, lack of motivation to obtain care, stigma, poor access to care, and providers' lack of awareness and knowledge about STDs. Consultants emphasized that STD care must be understood as urgent care. As such, STD care requires syndromic treatment, whether in the private sector or public sector, and the timely return of test results. Point-of-care tests, allowing results to be available during the clinic visit, are needed but must have acceptable performance characteristics (sensitivity and specificity). Diagnostic tests should be standard of care for STDs, even when syndromic treatment is provided; this allows for quality assurance and supports surveillance activities. Research into strategies to improve client access to and utilization of STD care should incorporate implementation strategies.

Principles

- ▶ **Existing barriers to care, whether geographical, temporal, financial, logistical, sociological or legal, should be reduced.** Quality STD care should be readily available, accessible, and acceptable to all persons, especially those at high risk for STDs. STD services must be

available without regard to insurance coverage or ability to pay. When publicly funded services are provided in the private sector, access to and quality of STD services must be ensured with, where applicable, contract language that is explicit and enforceable. Adolescents must be able to access STD services without parental consent, assistance, or notification. (High priority, high degree of consensus)

- ▶ **STD programs should collaborate with other organizations and agencies serving clients at risk for STDs to ensure that STD clinical and preventive services are available to these clients.** Organizations may include substance abuse treatment programs, homeless shelters, correctional facilities, schools, and community-based organizations serving persons at risk for STDs. (High priority, high degree of consensus)

Recommendations for Prevention Activities

- ▶ **STD programs should evaluate the local accessibility and utilization of STD care for persons at high risk for gonorrhea.** (High priority, high degree of consensus)
- ▶ **Programs should develop, implement, and evaluate targeted interventions to improve STD care utilization by high-risk persons.** Educational interventions for high-risk populations should increase STD symptom recognition and knowledge of the importance of promptly seeking care if symptomatic, and of the value of screening among asymptomatic persons. Integrated positive sexual health messages that address care-seeking behavior may increase the effectiveness of these interventions. Other interventions might include the use of incentives such as priority appointments or access to preferred providers. (High priority, moderate degree of consensus)
- ▶ **Programs should develop alternative sites for testing and care, in addition to traditional health department-based clinics.** Programs should assess community needs to guide determination of locations, hours, and other specifics of service delivery. Alternative sites should offer physical facilities or locations and processes which make patients comfortable and which are readily accessible. Sites may include outreach settings outside of any facility. Testing might be provided at some sites where examination and treatment are not provided. For selected high-risk persons, field collection of urine for gonorrhea testing is appropriate. (Medium priority, moderate degree of consensus)

Recommendations for Research Activities

- ▶ **Develop and evaluate novel strategies for screening and treatment outside of clinic settings.** One strategy currently under evaluation in the National Longitudinal Study of Adolescent Health involves screening of adolescents and young adults using mail-in urine specimens, delivering results through a telephone hot-line, and directing infected participants to local health facilities or the private sector for treatment. Other possibilities include home specimen collection with specimens mailed or delivered to a laboratory. (High priority, high degree of consensus)
- ▶ **Determine factors associated with failure to seek care among persons with gonorrhea symptoms, and evaluate the feasibility, cost and impact of interventions designed to improve STD care utilization by persons at high risk for gonorrhea.** Such interventions should decrease the interval from the appearance of gonorrhea symptoms to cessation of sexual

activity and to health care utilization. The prevalence, impact, and sources of stigma as a barrier to care should be considered. Some studies addressing these issues are ongoing or have been completed. (Medium priority, moderate degree of consensus)

- ▶ **Determine the extent and nature of self-treatment for gonorrhea.** Self-treatment may preclude care-seeking by the infected patient and interferes with provision of appropriate treatment to partners. Self-treatment with antibiotics may, at the population level, promote the development of antimicrobial resistance. Research on self-treatment should determine the prevalence of self-treatment, therapies used, and the impact on effective treatment of the patient and sexual partners. (Low priority, moderate degree of consensus)

IV. QUALITY OF CARE & EFFECTIVE TREATMENT

Principles

- ▶ **Programs should assure appropriate treatment of persons with gonorrhea.** Methods for monitoring treatment practices or verifying appropriate treatment of individuals with gonorrhea in the public and private sectors may need further development. Assisting with locating persons with gonorrhea who have not received treatment is an appropriate role for DIS. Prioritization of persons to be located may be necessary for programs in areas of high gonorrhea prevalence. (High priority, high degree of consensus)
- ▶ **Surveillance of antimicrobial resistance is critical to ensuring the appropriateness of treatment recommendations.** (High priority, high degree of consensus)
- ▶ **Policies should be implemented to ensure that STD risk assessment, risk-reduction counseling, screening, and initiation of partner services are reimbursable services in the private sector and, where applicable, the public sector.** Reimbursement is critical to ensuring that these activities occur, especially in the private sector. Within the public sector, screening may not currently be reimbursable through Medicaid or federally-funded programs if performed in an outreach venue rather than in a licensed facility. (High priority, high degree of consensus)

Recommendations for Prevention Activities

- ▶ **CDC should develop a policy document setting standards for STD care, including diagnostic testing and partner management, that is applicable to non-health department clinical settings.** Current standards are written for categorical STD clinics and are not viewed by many other providers as relevant to their management of patients with STDs. Endorsements by professional associations would facilitate acceptance by clinicians. (High priority, high degree of consensus)
- ▶ **Programs should improve the quality of STD care by educating public and private providers about STDs, emphasizing the importance of risk assessment, screening, prompt treatment, partner management, and prevention counseling.** To foster appropriate screening and counseling, providers need both training and specific tools for sexual history taking and risk assessment. Effective methods to achieve this goal need to be developed. Providers need to know that most persons will readily accept risk assessment and sexual safety

advice and counseling. Risk assessment, counseling, and screening may be particularly important among MSM, given recent outbreaks of gonorrhea and other STDs in MSM. Continued dissemination of the STD Treatment Guidelines to private sector providers is an important component of training for high quality STD care. (High priority, high degree of consensus)

- ▶ **CDC should continue to support and consider expanding the Gonococcal Isolate Surveillance Project (GISP).** Increased funding may be necessary to maintain culture capacity in participating sites. CDC should strongly consider expanding to additional sites including those in the private sector, adding data collection from women, and collaborating with the armed forces to obtain isolates or data. CDC should consider funding surveillance for quinolone-resistant *N. gonorrhoeae* (QRNG) at sites outside of GISP; this would broaden the surveillance coverage and enhance the ability to detect increases in QRNG prevalence. (High priority, high degree of consensus)
- ▶ **CDC should develop explicit criteria, based on the prevalence of gonorrhea and the prevalence of resistance, for changing the choice of first-line antibiotic therapy.** Some consultants disagreed on the necessity of having explicit criteria prior to the appearance and spread of resistance to a particular antibiotic agent. (High priority, moderate degree of consensus)
- ▶ **CDC should continue to assure production of spectinomycin and examine the potential therapeutic role for antibiotics that may be effective against *N. gonorrhoeae* and are not currently recommended for gonorrhea treatment.** (High priority, moderate degree of consensus)

Recommendations for Research Activities

- ▶ **Evaluate strategies to ensure treatment of patients who have positive tests for gonorrhea and were not treated on the day of testing.** Strategies may include delivery of treatment outside the clinic by non-medical personnel, availability of therapy through cooperating pharmacies, and patient incentives to return to clinic. For the private sector, practice- and clinician-based strategies may be effective. Policy and operational issues for these strategies should be assessed. (High priority, moderate degree of consensus)
- ▶ **Measure provider adherence to treatment guidelines for gonorrhea, and evaluate interventions designed to increase provider adherence where deficiencies exist.** (Medium priority, moderate degree of consensus)

V. SEXUAL BEHAVIOR CHANGE & INTERVENTIONS FOR HIGH-RISK NETWORKS

Workgroup Discussion

The workgroups noted that behavior change is a primary prevention intervention applicable to all STDs, including HIV. This important area is addressed in other documents, and was only briefly covered in the workgroup discussions at this meeting. Interventions to change sexual risk behaviors should be integrated with other strategies such as screening, presumptive therapy, and outreach and partner services. In addition, behavior change interventions should address care-

seeking behaviors and should be incorporated into positive sexual health education. Social and sexual networks of persons with gonorrhea are important groups to consider when implementing behavioral interventions.

For some patients, a diagnosis of gonorrhea may provide motivation to alter risky behaviors for the future prevention of other STDs, including HIV. For women, education about the sequelae of gonorrhea, such as PID and infertility, may provide further motivation for behavior change. For all risk groups, but perhaps especially for adolescents and young adults, gender and power issues may be particularly important in influencing behaviors and efficacy of behavioral interventions; these issues should be considered when designing interventions. Some substance abusers may be motivated to reduce sexual risk; the prevention needs of this group should be addressed. Persons with repeat gonorrhea may not necessarily have risky sexual behaviors, but simply may be members of a high-risk network. Because of this, accessing members of the network may be important for screening and behavioral interventions.

Principles

- ▶ **Interventions targeting persons at high risk for acquiring and transmitting gonorrhea, known as core group members, offer the potential to be far more effective in reducing community transmission of disease than interventions targeting persons at lower risk.** However, the impact of specific interventions targeting core group members or high-risk network members on the community incidence of gonorrhea needs to be evaluated. (High priority, high degree of consensus)
- ▶ **Persons with gonorrhea should be regarded as high priority to receive effective behavioral interventions.** Persons in the social and sexual networks of persons with gonorrhea, especially those with repeat infection, may also be appropriate for behavioral interventions. (High priority, moderate degree of consensus)
- ▶ **Social and structural factors should be integrated into the conceptual frameworks used to understand sexual behaviors and sexual behavior change.** (Medium priority, low degree of consensus)

Recommendations for Prevention Activities

- ▶ **HIV-infected persons should receive periodic risk assessments, behavioral counseling, and STD screening.** Providers must be trained in risk assessment and prevention counseling for HIV-infected persons. Providers must understand that most outwardly healthy HIV-infected persons remain sexually active and many are at high risk for acquiring STDs because of ongoing risky sexual behaviors. (High priority, high degree of consensus)
- ▶ **Programs should develop an operational definition of core group membership for application to program activities and research.** The core group comprises persons likely to acquire and transmit STDs due to their sexual behaviors and choices of sexual contacts. An initial definition might be persons with a history of repeat bacterial STDs, or members of high-risk sexual or social networks. The definition should be refined or adjusted over time, considering geography and specific behaviors as additional elements. (High priority, moderate degree of consensus)

- ▶ **Implement a “cluster” approach to identify high-risk persons in the same social or sexual network as selected persons with gonorrhea.** This approach would involve identifying high-risk individuals with gonorrhea, obtaining information on partners and other persons likely to be in the same sexual network, and accessing the latter group for screening or other interventions. In some settings, network approaches such as this may be more effective than partner notification in identifying persons likely to be infected with *N. gonorrhoeae*. This is one approach to defining a core group, which also may be targeted for counseling or other interventions, including empiric therapy. Social or drug networks may be easier to define and useful as surrogates for sexual networks. Priority individuals for this approach may include those with repeat bacterial STDs, those with high numbers of sexual partners, and those with other characteristics determined locally to be important in gonorrhea transmission. (High priority, moderate degree of consensus)
- ▶ **Programs should identify virtual and physical venues where MSM at risk for gonorrhea congregate, and access these venues for risk reduction interventions.** (Medium priority, moderate degree of consensus)
- ▶ **Programs should perform periodic screening for identified core group members.** Persons at particularly high risk for gonorrhea merit periodic screening. This activity differs from prevalence monitoring in that individuals are asked to return at specified intervals for repeated screening. An optimal interval for screening has not been defined, but an interval of 6 months may be reasonable and practical. (Medium priority, low degree of consensus)
- ▶ **Persons at risk for gonorrhea should receive brief, repeated risk assessments and behavioral counseling, including not only risk reduction but also STD symptom recognition education and counseling to improve care seeking behaviors.** In primary care, this may involve a 1- to 2-minute intervention; in STD clinics and other settings serving persons at high risk of STDs, the intervention may be longer. The effectiveness of one form of risk reduction counseling in the STD clinic setting has been documented. Persons who should be considered for these interventions include MSM, adolescents and young adults, persons with previous STDs, commercial sex workers, substance abusers, persons in short-term incarceration, and the homeless. (Medium priority, low degree of consensus)
- ▶ **CDC should encourage the use of rapid community-level assessment tools, to enhance the understanding of STD prevention challenges and needs.** Such assessments provide more detailed information than routine epidemiologic and behavioral surveillance. One such tool is the Rapid Ethnographic Community Assessment Process currently used by many STD programs to guide syphilis elimination efforts. (Medium priority, low degree of consensus)

Recommendations for Research Activities

- ▶ **Evaluate the feasibility and effectiveness of incorporating interventions targeting high-risk social or sexual networks into health department staff activities.** These interventions might involve screening, mass treatment, or prevention education. Mass treatment provided outside of a clinical setting should be considered. These approaches would require that staff spend considerable time in the community, interacting with community members. DIS may be uniquely qualified to perform these activities, and the success of this approach might lead to redefinition of DIS roles and new ways of evaluating DIS activities. (High priority, moderate

degree of consensus)

- ▶ **Effective behavior change interventions for persons with repeat infections and other core group members are needed.** Behavioral messages and interventions must be culturally relevant, age-appropriate, and group-specific. Once effective interventions are identified, operations research is needed to determine how to implement them. (Medium priority, moderate degree of consensus)
- ▶ **Evaluate the feasibility, acceptability, cost, and impact of long-term counseling (prevention case management) in reducing STD risk for core group members.** Counseling for persons with repeat gonorrhea should include consideration of leaving a high-risk sexual network, which in turn may imply leaving a social network in which risky behaviors are the norm. (Medium priority, low degree of consensus)
- ▶ **Define differences in social system parameters from one community to another, and evaluate the correlation with differences in gonorrhea rates.** A better understanding of how community characteristics contribute to the local maintenance of gonorrhea transmission will help to inform structural interventions. (Medium priority, low degree of consensus)
- ▶ **Examine the interrelationships among determinants of substance abuse, components of substance abuse treatment, and the success of interventions to change sexual behaviors.** (Medium priority, low degree of consensus)
- ▶ **Mass media messages oriented toward women and related to STDs, douching and fertility—messages that are broader than the routine safer sex messages—should be developed and evaluated.** (Medium priority, low degree of consensus)