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REPORT DOCUMENTATION PAGE

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1. REPORT NUMBER: AFIT/CI/NR 88- 28
2. GOVT ACCESSION NO.
3. RECIPIENT'S CATALOG NUMBER

4. TITLE *(and Subtitle)*: FETAL ALCOHOL SYNDROME AND EFFECTS: A CONTINUING EDUCATION OFFERING
5. TYPE OF REPORT & PERIOD COVERED: MS THESIS
6. PERFORMING ORG. REPORT NUMBER

7. AUTHOR(s): HARRIET ANN QUESENBERRY
8. CONTRACT OR GRANT NUMBER(s)

9. PERFORMING ORGANIZATION NAME AND ADDRESS: AFIT STUDENT AT: UNIVERSITY OF MARYLAND
10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS

CONTROLLING OFFICE NAME AND ADDRESS

12. REPORT DATE: 1988
13. NUMBER OF PAGES: 69

MONITORING AGENCY NAME & ADDRESS *(if different from Controlling Office)*: AFIT/NR, Wright-Patterson AFB OH 45433-6583

15. SECURITY CLASS. *(of this report)*: UNCLASSIFIED
15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

AD-A196 399

DISTRIBUTION STATEMENT *(of this Report)*

DISTRIBUTED UNLIMITED: APPROVED FOR PUBLIC RELEASE

DTIC ELECTE AUG 0 4 1988 S D H

17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20, if different from Report)*

SAME AS REPORT

18. SUPPLEMENTARY NOTES

Approved for Public Release: IAW AFR 190-1
LYNN E. WOLAVER Lynn Wolaver 18 July 88
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WHAT IS FETAL ALCOHOL SYNDROME?

Fetal Alcohol Syndrome (FAS) is a disease acquired by infants born to women who drink alcohol during their pregnancy. This disease which is classified as a syndrome has many symptoms. FAS is diagnosed when the following signs are observed:

A) Pre or postnatal growth retardation, below the 10th percentile.

B) Central nervous system impairment.

C) Characteristic facial dysmorphology, with the following signs: 1) microcephaly, 2) microphthalmia, 3) poorly developed philtrum, 4) flat maxillary area, and 5) thin upper lip.

Incidence

Fetal Alcohol Syndrome is identified to be one of the three most common causes of birth defects associated with mental retardation after Down's syndrome and neural tube defects. The most commonly accepted incidence for full fetal alcohol syndrome is 1-2 per 1000 live births, usually expressed as 1/750 live births (Cuttmacher, 1986). It is also the most preventable of the

birth defects given its direct correlation to the quantity of alcohol consumption by pregnant women.

BIO-SOCIAL-ECONOMIC-POLITICAL IMPACT

The risk that alcohol use will affect a fetus increases as consumption increases (Healthy People, 1979). Congenital defects occur in only 8 percent of the infants of non-drinking women; compared to 14 percent of the infants of moderate drinkers, 29 percent of heavy drinkers (10 drinks a day), and an astounding 71 percent of infants born to very heavy drinkers (more than 10 drinks a day). The biological defects can be low birth weight, mental retardation, or behavioral, facial, limb, genital, cardiac, or neurological abnormalities (Bry, 1983).

From a social standpoint, alcohol abuse affects the ability to parent (Finnegan, 1979). Although the most common reason for excessive drinking is tension reduction, chronic alcohol use actually increases a mother's irritability, depression, and anxiety (Mello, 1980). Combined with the fact that other frequent consequences of intoxication are aggression and decreased ability to gain from experience (Mello, 1980), the above suggests that alcohol abusing mothers are at risk for child abuse.

Approval Sheet

Title of Seminar Paper: Fetal Alcohol Syndrome & Effects:
A Continuing Education Offering

Name of Candidate: Harriet Ann Quesenberry
Master of Science, 1988

Seminar Paper Approval:

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Fetal Alcohol Syndrome & Effects

Comprehensive Rationale

By

Harriet Ann Quesenberry

Running Head: FAS

Seminar Paper submitted to the faculty of the
Graduate School of the University of Maryland at Baltimore
in partial fulfillment of the requirements for the
degree of Master of Science 1988.

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In identifying the economic impact of FAS, a Research Triangle Institute study (Harwood et al.,1980) estimated 1980 FAS costs as follows:

. A total of 3,600 babies born with FAS in 1980, accounting for health treatment costs of $14.9 million (based on a conservative incidence rate of 1 per 1,000 live births).

. A total of 68,000 FAS children under the age of 18, accounting for total treatment costs of $670 million in 1980.

. A total of 160,000 FAS adults requiring treatment with the associated cost of approximately $760 million in 1980.

. If the incidence rate was 1 in 600, as claimed to be more realistic, direct service costs per year for FAS individuals would approach $2.4 billion.

. Indirect productivity losses from FAS are estimated to total $510.5 million each year.

Politically, alcohol abuse in pregnancy crosses all borders, thus resulting in governmental resolutions and formations of agencies and task forces. Internationally, the World Health

Organization and several major relief organizations have initiated and funded educational programs to highlight the preventive aspects of alcohol abuse in pregnancy. Within the U.S., the 99th Congress recently proclaimed through Joint Resolution 189, January 12,1986 as "National Fetal Alcohol Syndrome Awareness Week" (UNESCO,1972).

Clearly FAS is a serious problem. The economic and social costs are tremendous. With the estimated annual cost of over a billion dollars in the U.S. and the incalculable cost of decreased human potential and biological tragedy, there exists a definite and unquestionable need to galvanize efforts aimed at those at risk through preventive measures.

There seems to be much confusion in public addresses and in written documentation about the meaning and comprehensiveness of prevention activities in the area of FAS. This confusion extends to issues related to the development, implementation, and cost of programs associated with prevention. Part of the confusion is due to a narrow perspective of what prevention means. Prevention is more than a medical intervention and as such demands a multiprofessional perspective if it is ever to become a viable part of the work of professionals in the fetal alcohol syndrome field. In order to develop a rational policy for preventive

activities in fetal alcohol abuse, it is necessary to look at the general principles of prevention.

Most of the recent activity on prevention comes from the public health and mental health fields. Prevention is conceived of as a comprehensive multidimensional concept (Goldston,1977). Primary prevention refers to acts that take place before the onset of a disease or social problem in order to stop the problem from occurring or to modify its course. Thus primary prevention activities may be undertaken by healthcare providers to prevent biological problems from occurring, teachers to prevent educational problems, social scientists to prevent psychosocial problems due to environmental factors and stresses, and so on. Goldston argues further that primary prevention activities relate to actions that are directed towards high-risk groups within the community. Programs developed for these groups are often educational in perspective rather than clinical in that these programs are conceived to increase people's knowledge about behaviors necessary to prevent a biomedical or psychosocial problem. Fetal alcohol syndrome is both a biomedical and a psychosocial problem. Strategies aimed at preventing FAS need to encompass the appropriate learning theories, which in turn, are dependent upon the target population: adult and adolescent women.

LEARNING THEORIES

To prevent FAS, the health professionals and educators need to be made aware of the causes for any rational decision-making to occur. Educational programs set up for this purpose must address the learning needs of the affected community, both adults and adolescents.

The basic principle of adult learning according to Knowles is that the teaching of adults is different from teaching children. Knowles (1980) identifies four assumptions about the adult learner in comparison to others: self concept, experience, readiness to learn, and orientation to learning. Self concept assumes that the adult learner is self directing, capable of decision making, and someone who should be actively involved in the learning process. Experience identifies that the adult learner has had past experiences which are resources for learning; for the nurse educator this would include clinical and personal experiences. Readiness to learn identifies what motivates a learner for particular topics; and orientation to learning refers to the assumption that adult learners prefer information that is immediately applicable (Knowles, 1980).

Recognition and understanding of the assumptions of adult learning theory are essential to the first step of the adult education process and in setting up any educational offering for adults. There are three sources of information for identifying needs; the individual learner, the organization, and society. Before any educational program is initiated, a needs assessment must be performed for the program to have any validity and meaning for the learners.

Looking to the individual for identification of educational needs applies Knowles' assumption of the adult learner. Seeking information from individuals involves them in the process and recognizes their self concept. Involving the learners in the identification of educational needs recognizes that each individual needs will be unique depending upon their past experiences, their readiness to learn, and their orientation to learning.

In dealing with an educational program involving FAS, the nurse educator must also perceive pregnancy, especially adolescent pregnancy, as an unresolved developmental issue. Levin's six stages of childhood development suggests ways adolescent pregnancy may be related to unresolved developmental issues (1985). When describing the normal stages of development,

major tasks of both the child and the parent during each stage will be addressed.

STAGE 1: BEING

In stage 1, the child learns the power of being. Her responsibility is to be and to ask. The child learns to trust the world, to believe she is loved and wanted, and that her needs are okay. Adolescents whose needs were not satisfied adequately during this stage may search for closeness, caring, bonding and love. Adolescents with unfinished stage 1 tasks require much support and nurturing from parents, professionals, and peers. They need to feel unconditional love, love they do not have to earn. Acknowledgement of their right to "be" can come from supportive listening, a hand on the shoulder, or a hug. They need others to help them think, therefore, positive structuring is important.

STAGE 2: DOING

During stage 2 the child learns the power of doing. She explores the environment and her senses. The child learns it is acceptable to be curious and intuitive, to explore and experiment, and to be active and receive support at the same time. Adolescents whose parents did not allow them to explore

their environment may be passive and depressed. Adolescents with unfinished stage 2 tasks need opportunities to explore and require protective, affectionate caretaking. It is essential to provide them with positive feedback and recognition of their accomplishments, however, they also learn they do not have to do anything to be considered worthwhile and valuable.

STAGE 3: THINKING

A child begins to separate, to say no, and to learn to think. The child learns she can let other people know when she feels angry, that it is acceptable to push and test, to find limits, and to think for herself. The adolescent whose ability to think has been discounted throughout her life may be angry and controlling. She may believe a conspiracy seeks to keep her uninformed. She may rebel against any sign of authority. Adolescents with unfinished stage 3 tasks need enough time, information, and support to learn to think. They should be encouraged to think, feel, and to express their thoughts. To ensure the feelings are expressed appropriately, they need structure. Consequences for inadequate behavior should be identified and enforced, and rewards given for appropriate behavior.

STAGE 4: IDENTITY

The child learns the power of identity. She tries new roles, tests her power, starts socially appropriate behavior, and separates fantasy from reality. Adolescents who have not successfully completed the stage of identity may act excessively powerful or excessively fragile. Adolescents with unfinished stage 4 tasks need compassion and complete honesty from others. They need appropriate responses for socially acceptable and unacceptable behavior. Rules should indicate clearly what is expected from them. Professionals should help them identify the "true" feeling so a solution to the problem can be determined. Likewise individual differences need to be supported as acceptable.

STAGE 5: SKILL DEVELOPMENT

The child interpolates her own structure, tests the rules, disagrees, makes up rules, and practices using her own values.If these needs are satisfied, the child learns she can trust her feelings to guide her, and that it is acceptable to disagree, that she does not have to suffer to meet her needs, and that it is acceptable to do things her own way. Adolescents who did not complete this stage successfully may be sullen, sulky, and difficult. They may not let others know why they know or do not

know, and they may spend time and energy pleasing other people and getting others to please them. Adolescents who become parents learn many new skills. They need positive feedback for the skills they demonstrate.

STAGE: 6 SEPARATION/REGENERATION

The child learns emotional separation, develops her sexual identity and, in some cases, separates physically from her parents by leaving home. During this stage, the child briefly revisits each stage (regeneration). Around age 13, the adolescent experiences an increased need to be taken care of (being). Frequently, behavior appears to have no logical motivation (doing). Around age 14, she becomes increasingly independent in thinking and may exert her independence through rebellion (thinking). Around age 15, she thinks about who she is as a person and tests her power (identity). At age 16, she reviews her hopes, disappointments, and memories, and dreams about the future. Adolescents by definition are in stage 6. Pregnancy during adolescence most likely results in incomplete fulfillment of the developmental tasks of stage 6. Stage 6 is complicated by the existence of pregnancy and parenthood regardless of whether or not developmental tasks are unfinished in other areas. Nurse educators should acknowledge the adolescent's feelings and her right to feel. Acknowledging that

it difficult to stay at home when they want to be independent indicates you are supportive. Give her the facts as they exist.

IMPLICATIONS FOR THE NURSE EDUCATOR

As is true for all professions, the authority for the nursing profession is based on a social contract between society and the profession (Donabedian, 1976). Authority for its functions and autonomy in the conduct of its affairs are assigned to the profession by society with the expectation that it acts responsibly in the interest of the public trust (Donabedian, 1976). To address societal problems related to alcohol and drug abuse adequately, the teaching of alcohol abuse content must therefore be considered inherent in this trust (American Nurses' Association, 1980).

The American Nurses' Association (ANA), as the professional association for nursing, has the responsibility to articulate, strengthen, and maintain the social contract that exists between the profession of nursing and society. It carries out this function in part by establishing standards of practice. This self-regulatory activity has currently been addressed with regard to nursing practice, and substance abuse disorders. An ANA task force has defined the focus of practice and formulated standards

for substance abuse nursing practice (Heinemann,1986). Nurse educators need to be cognizant of this development.

Nurse educators and providers enjoy an unusual favorable position to offer influential health education and counseling (Milo, 1976). They are a prime source of advice for parents on a wide range of developmental issues and on parenting styles that determine attitudes and orientations that are set early. This role has taken on greater importance with the isolation of families from grandparents and other traditional sources of child-raising advice and also decreased family sizes. The influence of nurses and healthcare providers can also extend to policy choices and health education programming decisions made in schools and community settings. The nurse educator, because of both her expertise in both nursing and education, is in a unique position to help in primary prevention of FAS.

FAS is preventable given that it is directly correlated to alcohol consumption. A conscious behavior change on the part of pregnant women relative to alcohol consumption will prevent FAS. Such a behavior change can be generated through educational programs tailored to various audiences. Many healthcare professionals and educators can play a significant role toward this end.

As a nurse educator in the US Air Force, I have developed this educational program to serve as a primary preventive tool. It is mainly intended for entry-level medical technicians in the USAF, although the program with minor changes can be applied to local high school audiences and community service organizations such as the Young Women's Christian Association (YWCA).

These entry-level medical technicians are in a unique position to influence not only the base community but also the surrounding civilian community. They are most likely to fall in with Levin's Separation/Toleration Stage of development and Knowles' four assumptions of adult learners (self concept, experience, readiness to learn, and orientation to learning) due to:

. their age, usually 17-25 years,

. educational background, generally a high school diploma with 1-2 years of college, and

. paraprofessional health training in the Air Force, usually taught by USAF nurses.

Medical technicians are in an unusual position, through their social interactions, to sway the most vulnerable of the

population against the dangers of alcohol consumption during pregnancy. This population base consists of adolescents and young adult women in the areas surrounding the local base including local high schools, work force, and clubs.

It is recommended that the nurse educators be experienced in obstetrics and pediatrics prior to presenting this program. However, other qualified healthcare professionals such as social workers, and physicians can equally serve as presenters.

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Fetal Alcohol Syndrome & Effects

A Continuing Education Offering

4 Contact Hours

Presented By: Captain Harriet Ann Quesenberry, USAF, NC

Target Audience: USAF Medical Technicians

Suggested Presentation Schedule

Time		
0730-0800	1.	Registration & Student Handouts
0800-0810	2.	Review Objectives
0810-0820	3.	Pretest & Attitude Inventory
0820-0900	4.	Overview, Introduction, FAE Historical Research
0900-0910	5.	Break
0910-0925	6.	Continuum of Effects . Fetal Death . Fetal Alcohol Syndrome . Lesser Fetal Alcohol Effects . Infant Addiction
0925-0950	7.	How Fetal Alcohol Effects Occur . Blood Alcohol Content . Critical Stages of Fetal Development . Individual Differences
0950-1000	8.	Break
1000-1030	9.	The Paternal Factor
	10.	Incidence of Fetal Alcohol Effects
	11.	Prevention of Fetal Alcohol Effects . Education . Identification and Intervention
	12.	Networking for Prevention
1030-1130	13.	Case Studies, Presentations
1130-1150	14.	Posttest & Evaluation

CONTINUING HEALTH EDUCATION PROGRAM OUTLINE

LEARNING OBJECTIVES *(Stated behaviorally)*	ASSOCIATED CONTENT AND CONTENT HOURS *(Related to objectives)*	TEACHING METHODS INSTRUCTIONAL MEDIA *(Appropriate to objective and content)*	EVALUATION PLAN *(Measures objectives) (Attach copy of pre/post tests, quizzes, performance checklist, etc.)*
Behavioral Objectives:			
1. Identify patients at risk for Fetal Alcohol Syndrome	Continuum of effects a) fetal death b) FAS c) lesser FAS d) infant addiction	Lecture with 35 mm slides and transparencies throughout the program (2 hours)	Test items 1 through 10 (Pre & Post test) Group Presentations
2. Explain the effects of FAS	Overview Introduction Historical FAE Research How Fetal Alcohol Effects Occur a) BAC b) Critical stages of fetal development c) Individual differences	"	Group and class discussion
3. Differentiate interventions used in preventing FAS from occurring	Prevention of Fetal Alcohol Effects a) education b) identification	Group Role Play (45 min)	Group discussion & feedback Test items 11 through 20 Case Studies
4. Propose intervention(s) for a high risk woman	Networking for prevention	"	Evaluation questions on post test
5. Prioritize care given to a FAS infant and its mother	"	"	Personal Attitude Inventory Test items 22 & 23
6. Propose a procedure which may be helpful in identifying & assessing a FAS infant and its Mother	"	"	"

Students Objectives for Fetal Alcohol Syndrome Effects Workshop

Behavioral Objectives:

At the conclusion of this program, the participant will be able to:

1. Identify patients at risk for Fetal Alcohol Syndrome.
2. Explain the effects of FAS.
3. Differentiate interventions used in preventing FAS from occurring.
4. Propose intervention(s) for a high risk woman.
5. Prioritize care given to a FAS infant and its mother.
6. Propose a procedure which may be helpful in identifying and assessing a FAS infant and its mother.

INTRODUCTION

TRAGIC NEWS Alcohol consumed by mothers during pregnancy is believed to cause serious damage to thousands of infants each year. The damage ranges from death, fetal alcohol syndrome (FAS) consisting of growth retardation, central nervous system malfunction, head and facial deformities, and fetal addiction, to fetal alcohol effects short of complete alcohol syndrome. The most severe effects are linked to heavy consumption of alcohol. But even moderate social drinking is suspect, and recent research has indicated that there is no known safe level of alcohol consumption for the fetus carried by the pregnant woman.

GOOD NEWS All these fetal alcohol effects are preventable. If ethanol (beverage alcohol) is not present in the fetal environment, its effects cannot occur. Therefore, if pregnant women do not drink alcohol (or consume it in foods or medications), these infants cannot suffer its toxic effects.

Abstinence from alcohol during pregnancy was urged by the Surgeon General in July 1981, when the Food & Drug Administration issued the Surgeon General's Advisory on Alcohol and Pregnancy. In June 1982, the American Medical ASsociation House (AMA) of Delegates agreed that, since no safe level of maternal alcohol use has been established, "the safest course is abstinence" (Dolan, 1982).

Recognizing the urgency and the need to eliminate any cause impacting human potential, the National Institute on Alcohol and Alcohol Abuse (NIAAA) has placed a high priority on fetal alcohol effects. NIAAA has produced numerous print materials for professional use, and a variety of audiovisual materials have been produced with NIAAA support. The Fall 1985 issue of NIAAA's journal, Alcohol Health and Research World, was devoted totally to the prevention of alcohol-related birth defects and is the most current general update on the topic.

Because of the federal government's intervention and interest, many fetal alcohol syndrome/effects education programs have been provided to thousands of school children and health professionals in the last few years.

A review of the literature provides an historical perspective which enhances an understanding of FAS and its effects.

HISTORY OF FETAL ALCOHOL EFFECTS RESEARCH

"Pattern of Malformation in Offspring of Chronic Alcoholic Mothers", by Kenneth Jones, David Smith and others appeared in the medical journal, Lancet, in 1973. This was the first research report in the US which identified and named the fetal alcohol syndrome, attributing specific fetal dysmorphogenesis to maternal alcohol ingestion. Dr. Smith notes that his research project was

stimulated when one of his colleagues at the University of Washington, observed in 1972 that "some children born of women known to be chronic alcoholics tended to be smaller than normal and to have evidence of aberrant motor function and behavior, e.g., unusual irritability in infants, and hyperactivity in older children" (Smith, 1979).

Throughout history, a connection between alcohol and adverse pregnancy outcomes has been noted.

In the Old Testament of the Judaic Bible, a messenger angel is said to have warned Samson's mother, "Behold, thou shalt conceive, and bear a son; and now drink no wine or strong drink" (Judges 13:7). A similar message is seen in the laws of ancient Carthage which prohibited bridal couples from drinking on their wedding night for fear of conception of a damaged child (Streissguth, 1980). Plato, the Greek father of Western philosophy, suggested that, in the ideal state, drinking alcohol should be barred "to any man or woman who was intending to create children" because "it is quite hard to tell just what night or day the child will be conceived....children shouldn't be made in bodies saturated with drunkenness" (Plato, Bk IV). Later between 200-500 AD, the Babylonian Talmud warned pregnant women: "One who drinks intoxicating liquor will have ungainly children" (Robe, 1982).

Warnings became common in England, beginning in 1726, when the College of Physicians became sufficiently alarmed by the alcohol-pregnancy problem to petition Parliament to place controls on the distilling trade, indicating that parental drinking was "a cause of weak, feeble, and distempered children" (Robe, 1982). Cheap gin had flooded the country, permitting alcohol to be used heavily by many who previously had not had easy access to it. Birth rates dropped and infant mortality rose.

The problem continued, however, and in 1787, Dr. Benjamin Rush, a signer of the Declaration of Independence, and one of the first English-speaking physicians to view alcoholism as a disease, opposed alcohol use by pregnant women because of the danger of producing alcohol dependence in the child (Robe, 1982).

Throughout the nineteenth century, journals noted increased occurrence of mental retardation, seizures, stillbirths, and infant deaths among children of alcoholic parents. A 1834 report to the British House of Commons noted that infants of alcoholic mothers sometimes had a "starved, shrivelled and imperfect look" (Smith, 1979). In 1849, Dr. William B. Carpenter of the University of London was awarded a prize by a distinguished panel of physicians for his essay, "The Use and Abuse of Alcohol Liquors in Health and Disease". The essay, a review of mid-19th century information on alcohol effect in general, included reports of impaired mental development in the offspring of

alcohol abusers. In his report, Carpenter quoted W. Brown , resident physician of the Christian Lunatic Asylum, who asserted, "The drunkard not only injures and enfeebles his own nervous system, but entails mental disease upon his family. At present I have two patients who appear to inherit a tendency to unhealthy action of the brain from mothers addicted to drinking; and another, an idiot whose father was a drunkard" (Medelson, 1980).

A generation later in 1899, William Sullivan , physician at a Liverpool prison, published the first recognized scientific report on fetal effects of maternal use of alcohol. The population studied included 120 female prisoners and their offspring. Among the women who drank during pregnancy, stillbirth and infant death rate (to age 2) was 56 percent, more than double that of non-alcoholic female relatives. Sullivan noted that poor pregnancy outcomes increased with successive pregnancies, and concluded that "maternal intoxication" was the main source of damage to the fetus (Medelson, 1980).

In 1910, Taav Laitenen, M.D., of Finland, reported to the International Congress of Alcoholism his observation that drinking during pregnancy was connected with low birthweight. Of 20,000 infants born to his patients, infants of abstainers averaged the highest birthweights; those of light drinkers (one beer/day) were next; and "drinkers" infants were smallest. Laitenen reported that the weight differences were still seen at

eight months of age, with the "drinkers'" children developing most slowly (Medelson, 1980).

As early as 1923, A.L. McIlroy observed in a British journal that alcohol goes through the placenta. "Alcohol is a poison", he wrote, "and the fetus of a chronic alcoholic mother is itself a chronic alcoholic, absorbing alcohol from the mother's blood and subsequently from her milk" (Medelson, 1980).

During the first half of the twentieth century, however, little further research about alcohol and pregnancy was reported or taken seriously. With Prohibition and its subsequent repeal, admonitions against alcohol use during pregnancy were disregarded by the general cultural temper of the times which tended to find ridiculous any warnings about danger of alcohol use. The usual attitude was that any developmental problems observed in children of alcoholic mothers were attributable only to inadequate postnatal nutrition and disturbed home conditions, rather than to prenatal exposure to alcohol (Robe, 1980). In her book, Just So It's Healthy, Lucy Robe states that many doctors whom she interviewed admitted that "they were aware that the alcohol molecule was small enough to cross the placenta. They simply did not believe any harm would result" (Robe, 1980).

Some doctors were seeing infants of alcoholic mothers being seriously impaired, however, and were beginning to investigate.

By 1957, a medical thesis (J. Rouquette, University of Paris) filed in Paris and apparently never published, described quite clearly the malformations, growth problems, and poor development of children whose mothers were alcoholic (Streissguth, 1980). In France, a Dr. Lemoine described the unique similarity of facial characteristics, growth retardation and neurological problems of 127 offspring of alcoholic mothers. Lemoine said "the children resembled each other to such a degree that the diagnosis of maternal alcoholism could be made from examination of the child" (Streissguth, 1980). This report received little attention, and was unknown to Jones, Smith, Ulleland, and the others working at the University of Washington until after their initial identification of the fetal alcohol syndrome in 1973.

Through the past 15 years, research on FAS effects has mushroomed. By 1985, the number of published FAS-related scientific papers numbered more than 2,000.

The FAS and effects topic is not of interest to American scientists alone. In addition to the American research , hundreds of case reports have been published in the health professional literature of many countries, including Germany, France, Ireland, Sweden, South Africa, Canada, Australia, Hungary, and the USSR.

Just what are the conclusions of all these reports? And what

do they reveal about the problems of fetal alcohol effects?

Since 1973, fetal alcohol effects research has been ongoing with reports of clinical case studies, epidemiological studies, and animal studies. According to the AMA Report of June 1982, "what has emerged from these and other studies and additional case reports is a positive correlation between maternal alcohol and a possibility of a kind of dose-response phenomenon through which different levels of alcohol intake may be roughly associated with differing degrees and types of adverse effects and outcomes" (Dolan, 1982).

The continuum of fetal alcohol effects ranges from fetal death through the complete FAS to what are called 'lesser' fetal alcohol effects, and sometimes fetal alcohol addiction evidenced by postnatal withdrawal symptoms.

FETAL DEATH

Several studies report increased incidence of spontaneous abortion and stillbirth of two to three times for those drinking three or more drinks per day over those using less than one drink per day (Kaminski, 1981; Harlap & Shiono, 1980). Even moderate drinking has been associated with spontaneous abortions, and Sokol's research in Cleveland indicated an increase in both premature placental separation and infection, as well as fetal

distress during labor, all life threatening effects (1980).

FETAL ALCOHOL SYNDROME

Following the initial identification of the FAS in 1973 and subsequent research, a system of minimal criteria for diagnosis of FAS was issued in 1980 (Rosett). The FAS Study Group of the National Council on Alcoholism (chaired by Henry Rosett) outlined the minimal criteria as:

Evidence of abnormalities in three specific areas:

1. Prenatal and/or postnatal growth retardation
   - evidenced by weight, length, and/or head circumference below the 10th percentile when corrected for gestational age.
2. Central nervous system involvement
   - neurologic abnormality
   - developmental delay, or
   - intellectual impairment
3. Characteristic facial dysmorphology - at least 2 of the following:
   - microcephaly (head circumference below 3rd percentile)
   - microphthalmia and/or short palpebral fissures
   - poorly developed philtrum
   - flat maxillary area
   - thin upper lip

In addition to the three diagnostic signs, there are associated non-specific abnormalities including cardiac murmurs and septal defects, renogenital anomalies, and skeletal malformations.

Dr. Rosett also noted that "in some cases, the diagnosis of FAS can be made in the neonate; in others, postnatal growth retardation and developmental and intellectual delay may not be apparent before one or two years". Characteristic facial anomalies may be more easily discerned after the newborn period.

Recent studies indicate that a variety of ophthalmic, speech and hearing problems are also closely associated with FAS (Gonzalez, 1981; Iosub, 1981).

LESSER FETAL ALCOHOL EFFECTS

When a child suffers any of the aforementioned effects less than the complete syndrome, the term FAE or Fetal Alcohol Effects is preferred. Low birthweight and/or neurological deficit are among the most commonly reported. Some researchers describe learning deficits in children born to alcoholic mothers but lacking the complete diagnostic criteria for FAS (Streissguth, 1980; Warren & Rosett,1978). It is suspected that in utero alcohol exposure may sometimes produce the subtle neurological abnormalities grouped under the classification of minimal brain dysfunction (MBD) (Shaywitz, 1978) characterized in humans as "hyperactivity, poor attention span, school behavioral

difficulties, impaired habitation, and cognitive and perceptual problems" (Warren & Rosett, 1978). Shaywitz found a high incidence of MBD in 11 children of alcoholic mothers. These children tested within the range to normal intelligence, but suffered learning disorders with problems in attention span and memory retention and recall (Shaywitz, Griffith, & Warsaw,1978). Shaywitz et al also demonstrated in animal studies "an association between maternal alcoholism and MBD", when they fed alcohol to pregnant cats and later observed hyperactivity and learning deficits in the offspring (1978).

INFANT ADDICTION

The fetus of a pregnant woman who drinks alcohol will have blood alcohol concentrations equivalent to the mother. It has been found that the blood alcohol levels of the fetus fall more slowly than that of the mother (Warren & Rosett, 1978). When the pregnant woman is drinking alcohol, the fetus may develop a dependence on these high blood alcohol content (BAC) concentrations. When the child is delivered, it is suddenly deprived of alcohol and may suffer withdrawal reactions such as irritability, increased muscle tension and tremor and a lower threshold for seizures. Dr. Sophie Pierog reported on six infants with classic FAS symptoms plus classic alcohol withdrawal symptoms. Their mothers were chronic alcoholics. When extensive testing revealed no metabolic or infectious reasons for the

symptoms, the pediatricians were certain they were dealing with withdrawal. The symptoms began within the first 24 hours (6-12) on the average, but sometimes as soon as 3 hours after birth. Dr. Pierog found the withdrawal usually lasted about a week, "but some of our babies had continued stiffness and irritability even after four to six months. Whether these symptoms were the result of the withdrawal itself or due to the basic damage caused by the alcohol, I'm not sure" (Pierog, 1977).

Other studies of neonatal behavior link even moderate maternal alcohol consumption (1- 1 1/2 drinks/day with occasionally 2-5 drinks/day) to neonatal alcohol withdrawal symptoms (Landesman-Denver, 1978).

One report describes 15 FAS infants whose mothers were drunk at the time of delivery. Life-threatening convulsions occurred in one-third of the case studies. Apnea was common (Robe, 1981).

An alcoholic infant may not be seen in withdrawal in the newborn nursery. If the drinking mother is breastfeeding (and drinking), the infant's withdrawal will be delayed until weaning, although irritability may be seen if feedings (and alcohol dosage) are delayed. If the mother had stopped drinking during the later stages of the pregnancy, the fetus would have withdrawn in utero along with the mother's withdrawal.

What happens when an alcohol-addicted infant, withdraws in utero or postnatally, grows up and is exposed to alcohol again in a social drinking situation? The infants in the studies cited have not yet been followed to that point. If they follow the usual pattern of alcoholism, an incurable disease, relapses of which are triggered by tissue exposure to the chemical, they will be at extremely high risk for adult alcoholism. Frank Seixuz, M.D., former Medical Director of the National Council on Alcoholism said in 1977: "The possibility of these children having a triple load of potentiality for alcoholism is great. Namely, the possible genetic effect, plus the infant metabolism changes, and the social effects of having to live with an alcoholic mother" (Robe, 1982).

A recent joint report by the National Alcohol Research Center at Washington University (St. Louis, MO) and the Umea University School of Medicine (Sweden) closely studied adopted children in Sweden. The researchers found that, if the natural parents of the adopted children were alcoholic, despite being raised by nonalcoholic adoptive parents, they ran a greater risk of becoming alcoholic. Among adopted daughters whose natural parents had alcohol problems, the risk was 2-3 times that of the general population. Daughters whose mothers had alcohol problems were much more susceptible than those whose fathers drank. The report does not connect the results to alcoholic drinking during the actual pregnancy (Johnson, 1982).

Observations on fetal addiction are supported in animal studies, such as Abel's which indicated that, "in rats, prenatal exposure to alcohol modifies adult responsiveness to alcohol and to drugs for which alcohol causes cross tolerance (e.g. pentobarbital and diazepam) but does not alter responsiveness to drugs for which alcohol does not induce cross tolerance (e.g. morphine, chlorpromazine or d-amphetamine). This pattern of effects suggests that alcohol exposure in utero alters specific cellular mechanisms underlying tolerance in the brain...(and) appears to be sex-related with females showing greater sensitivity" (Abel, 1981).

HOW FETAL ALCOHOL EFFECTS OCCUR

According to the 1982 AMA Report, "the mechanism of alcohol's teratogenic effects is not well-understood" (Dolan).

One of the most commonly held hypotheses is that of Rosett who states "alcohol's adverse effects result from its cumulative action on the maternal-placental-fetal system throughout the pregnancy" (1980). This leads to the recognition of three particularly important variables in the alcohol exposure/effect relationship:

1. Blood alcohol content (BAC) -- how much alcohol?
2. Critical stages of fetal development -- when does the exposure occur?

3. Individual genetic and physiological differences in susceptibility -- who is the mother, and who is the fetus?

BLOOD ALCOHOL CONTENT

How much alcohol will cause problems for the fetus, and how much might be safe? This is a very difficult, perhaps impossible, question to answer at today's level of research.

As mentioned before, to this date, no safe level of alcohol use during pregnancy has been determined. A system of average consumptions and related possible outcomes, however, has been suggested by NIAAA (1979) with the reminder that stages of fetal development and individual difference must be considered as important interrelating factors. The possible risk levels according to alcohol consumption are as follows: (Drink = 12 oz. beer; 4-5 oz. wine; 1 1/2 oz. liquor)

Heavy Drinking - more than 4 drinks/day (NIAAA,1979) or 5 drinks occasionally with at least 45 per month (Rosett,1978).

1. Full FAS may occur. Sokol's study in Cleveland indicated a risk of 2.5%.

2. Any fetal alcohol effects at a risk of 50%, including:

a) spontaneous abortions	30%
b) neonatal depression	20%
c) low birthweight	25%
d) intrauterine growth retardation	20%
e) anomalies	40%

Moderate Drinking - 2-4 drinks average per day (NIAAA,1979)

> Hanson estimates at least a 10% risk for "recognizable signs of altered growth and morphogenesis, clinically apparent at birth" (1978).

Light Drinking - 1 drink per day

> Available animal data indicates that, at least in animals, one drink per day will sometimes "produce learning impairment in offspring which appear morphologically normal" (Iber, 1981).

Admittedly, there are uncertainties about the effects of moderate drinking. The AMA Report of 1982 states that "more convincing, although still inconclusive, is evidence associating moderate drinking with spontaneous abortions, behavioral dysfunction, adverse mental and motor development, and impaired newborn conditioning" (Dolan, 1982). More research is needed in this area.

Binge Drinking - 5+ drinks at a time occasionally.

Information on the effects of "binge drinking" by pregnant women is less conclusive than that of regular drinking. However, structural brain abnormalities (heterotopias) have been reported at autopsy of infants whose mothers had 5 or more drinks on at least one occasion during pregnancy (Clarren, 1978). Only 50% of the infants had been diagnosed as having FAS from external criteria.

Animal studies have indicated that 'binge' exposure to ethanol in early pregnancy can damage the fetus. In one study, pregnant mice received two doses of ethanol (each dose a human equivalent of 4 drinks) four hours apart on day 7 of gestation (equivalent to week 3 of human pregnancy). Twenty-four hours after exposure, an overall decrease in embryo size was noted, with brain size especially affected. At that time, histological (cell) changes also appeared in the developing brain. Early embryonic death was almost double the incidence in controls. The researchers indicate these deaths might be due to interference with heart development. Seven days after the ethanol these 30 also had abnormal nasal and upper lip malformations closely resembling those seen in human FAS (Sulik, 1981).

Primate research at the National Institute of Child Health and Human Development indicates that 'binge' exposure to alcohol may be followed by periods of severe oxygen deficiency in the fetus. Pregnant monkeys were fed alcohol intravenously, and researchers observed a rapid onset of blood vessel collapse in the umbilical cord, lasting up to an hour. This effect was recorded by fiber-optic video cameras, and considerable public interest was aroused when the video recordings of the sudden collapse of umbilical circulation were shown on national television newscasts in 1982. The researchers at National Institutes of Health continue to study the problem of alcohol-induced fetal oxygen deficiency, and they "wonder about the

consequences of repetitious ethanol insults on fetal brain development, whereby transient hypoxia within the fetus may take a cumulative toll on fetal brain development and maturation (Mukherhee & Hodgen, 1982).

CRITICAL STAGES OF FETAL DEVELOPMENT

Potential for alcohol damage exists at any time in pregnancy. The type of damage which occurs may depend on the time of exposure to alcohol.

FIRST TRIMESTER

This appears to be the critical period for dysmorphology, or defects in structure. "Alcohol may effect the cell membrane and cell migration, altering embryonic organization of tissue" (Rosett, 1980) in whatever susceptible structure is developing at the time of exposure, be it brain, heart, genito-urinary, etc.

The embryonic brain, like the adult brain, seems to be especially sensitive to alcohol. According to Dr. C. F. Enloe, "in the early embryo, the primitive brain cells migrate away from an area called the germinal matrix and proceed to other areas in the developing fetal central nervous system where they become organized as a cerebral cortex, cerebral nuclei, cerebellum, etc". Alcohol, for reasons not completely understood,

diminishes the number of cells within the germinal matrix, and also alters their migratory paths. Consequently, the brain is primordially smaller due to fewer numbers of neurons, and the neurons that are present are frequently in the wrong places. The technical term for these misplaced neurons is heterotopias (Enloe, 1981).

The growth retardation so common to fetal alcohol effects may have its origin in the first trimester of alcohol "insult to cell proliferation leading to diminished fetal cell numbers" (Smith, 1979). Animal studies have supported this possibility. Rat embryos in vitro were exposed to ethanol with resultant reduction in cell proliferation (Brown, 1979). This theory is a possible explanation to the question of why fetal alcohol affected children do not 'catch up' with excellent postnatal nutrition.

SECOND TRIMESTER

The second trimester is apparently a critical period for fetal loss due to alcohol exposure (Dolan, 1982) perhaps due to the mother drinking irregularly yet heavily causing repeated episodes of stress such as hypoxia (Warren & Rosett, 1978), as well as the danger of premature separation of the placenta.

Growth retardation continues in this period through

alcohol's interference in fetal metabolism and absorption of nutrients.

THIRD TRIMESTER

This period, normally one of extremely rapid growth, continues to be critical for impairment of the total growth process. The central nervous system may be the most "susceptible to injury because this is the time of rapid brain growth and neurological organization" (Van Thiel, 1982).

INDIVIDUAL DIFFERENCES

Genetic differences in metabolization of and susceptibility to effects of alcohol may play a role in fetal alcohol effects. Presently undetermined biological predisposing factors may cause specific mothers and/or fetuses to be at either high or low risk for FAS or effects (Diaz & Samson, 1980).

An interesting illustration of this factor is the report of twins born to alcoholic mothers. In three pairs of fraternal twins, one twin exhibited all of the physical deformities of the syndrome while the other twin was either apparently normal or only very slightly affected (Iber, 1981). These twins, resulting from fertilization of two eggs, received the same amount of exposure to alcohol at the same periods of the pregnancy. Their

genetic makeup was slightly different. One pair of affected identical twins, however, shows equal deformities (Iber, 1981).

Linda Cervantes, a medical anthropologist at Stanford University, discusses the possibility that a father's drinking of alcohol may contribute to a genetic vulnerability to fetal alcohol effects in their children because of sperm damage. Some animal experimentation has supported the importance of possible genetic differences. Chernoff found alcohol-related fetal deaths as well as malformations most common in a specific mouse strain that has low alcohol hydrogenase activity and is a slow metabolizer of alcohol (Streissguth, 1980).

The chronicity of the mother's alcoholism seems to be another factor in individual differences. Case studies show increasingly adverse pregnancy outcomes in proportion in duration of alcoholism (Fitze, 1978), perhaps due to hepatic and other physiological changes in the mother secondary to the disease process. Thus later children in a family may be more at risk than earlier children as were later litters of piglets in alcohol-fed miniature swine in Dexter's study (Dexter, 1980).

The question of why some infants are more affected by alcohol exposure than others is one which, if answered, will be a breakthrough for an understanding of fetal alcohol affects and their prevention.

THE PATERNAL FACTOR

One question constantly raised by women and men concerned about preventing fetal alcohol effects in their families is: what harm can be done to a fetus by alcohol consumed by the father?

Currently available evidence has not established a connection between paternal alcohol ingestion and FAS.

"Ethanol's effects upon the progeny of male alcohol abusers is likely to be either nonexistent due to failure of spermatogenesis or failure of fertilization or lethal due to serious genetic injury which allows fertilization to occur but is inconsistent with subsequent growth and development of the fetus" (Van Thiel & Gavaler, 1982).

Some animal studies show adverse fetal outcomes from paternal alcohol use prior to conception, but the data is relatively inconclusive. One recent mouse experiment indicated significant growth retardation but no FAS dysmorphology due to paternal alcohol exposure (Anderson, 1981), while three earlier studies showed intrauterine death or decreased litter and fetal size in the guinea pig (1913), mouse (1975), and rat (1976) (Joffe, 1979).

Joffe (1979) states that the possibility of paternally-

induced drug effects is sufficiently serious to suggest an urgent need for research to establish possible mechanisms, which might include sperm damage, drugs in the seminal fluid, other alterations in the semen, and indirect effects as a result of the 'changed' male. He also suggests that pediatricians investigating birth defects of infant mortality obtain retrospective information not only about the mother's drug/alcohol ingestion, but also the father's drug/alcohol use prior to the pregnancy and particularly around the time of conception. Such information might lead to an expanding of knowledge about the origins of some disorders currently considered to be of unknown etiology.

Even though the connection of male ethanol ingestion to fetal alcohol effects has not been firmly established, research has shown significant effects of alcohol on male sexual function. Dr. David Van Thiel and his colleagues at the University of Pittsburgh have been in the forefront of this research indicating that heavy alcohol use can produce impotency, sterility, and feminization in men by reducing sperm count and testosterone levels and increasing estrogen activity -- common complication of male alcoholism.

Especially interesting to the social-drinking male is Van Thiel's finding that even moderate intermittent ethanol ingestion can transiently depress plasma testosterone levels and spermatogenesis (Van Thiel & Roger, 1976).

These known serious effects on male function continue to underscore the question, as yet unanswered -- "what possible effects might the use of this potent drug have on a fetus due to the father's exposure?"

INCIDENCE OF FETAL ALCOHOL EFFECTS

How often can fetal alcohol damage be expected to occur?

The most commonly accepted estimate of incidence for the full fetal alcohol syndrome is 1-2 per 1000 live births, usually expressed as 1/750 live births. This rate would place FAS incidence as one of the three most common causes of birth defects associated with mental retardation -- with Down's syndrome (1/600 live births) and neural tube defects (1/1000 live births).

It is difficult to find a commonly accepted estimate of incidence of fetal alcohol effects short of FAS. It is probably the most common preventable problem. Special concern may be addressed to the possibility of increasing incidence of both FAS and related effects in proportion to increases in alcohol consumption by young women. The National Institute of Drug Abuse (NIDA) report, Class of '86 (Johnston, 1987) shows the following level of alcohol use by high school senior women nationally:

Any alcohol use before 10th grade	50.5%
Any alcohol use before graduation	91.6%

Any alcohol use in previous 30 days	64.3%
Heavy alcohol use in previous 14 days (5+ drinks on at least one occasion)	31.0%
Daily alcohol use	2.8%

This use of alcohol in the teen years places these women at double jeopardy, at risk of developing alcohol problems impacting on pregnancies in later adult years,as well as at risk of combining alcohol and pregnancy now as one of the more than 1 million teenagers (11% of all girls ages 14-19) pregnant each year (Cuttmacher, 1986). Another unanswered question is what, if any, effect does the exposure to alcohol during the developmental years of adolescence have upon the life-long supply of ova carried by the drinking teenage girl?

PREVENTION OF FETAL ALCOHOL EFFECTS

At least two practical modes exist for prevention of fetal alcohol effects:

1. Education of all women of child-bearing age (in fact of all human beings, female and male, of any age) about fetal alcohol risks.
2. Identification, intervention and treatment of alcohol-abusing women -- preferably before pregnancy. If not then, as early as possible in the pregnancy.

EDUCATION

If women are to choose to avoid alcohol for the purpose of

enhancing the likelihood of a healthy pregnancy outcome, they must be informed about the risks and benefits involved. Preferably this education should occur before pregnancy begins, with reinforcing information during pregnancy. This education, therefore, can come to the woman through many sources -- family, school, community organizations, church, media, drug and alcohol agencies, and health care professionals.

By the time a woman is in contact with a health care provider for prenatal care, hopefully she may have already been informed about the alcohol-pregnancy problem through one or more educational sources. But, the prenatal caregiver has both special strength and a special responsibility for this education. A national attitude study commissioned by NIDA indicates that women expect and claim a right to education from health care providers on all areas of pregnancy information, including fetal alcohol effects (NIAAA, 1982).

The Surgeon General's Advisory specifically states, "Each patient should be told about the risk of alcohol consumption during pregnancy and advised not to drink alcoholic beverages and to be aware of the alcoholic content of food and drugs" (1981). The June 1982 AMA Report agrees that patient education is needed to enhance the public's understanding of fetal alcohol risks. It suggests that, in order to prepare patients for intelligent decision-making concerning alcohol use during pregnancy,

physicians (health care providers included) should inform patients about fetal alcohol effects (Dolan, 1982). Gurel (1976) also stressed the importance of patient education before pregnancy, as well as in the prenatal care period, to prevent problems arising from uninformed use of alcohol during early pregnancy before recognizing that conception has occurred. The nursing profession is at a particular advantage because once identified as pregnant by laboratory tests, patients are usually screened by nurses in physicians' offices or clinics prior to seeing a physician.

Alcohol/pregnancy education does make a difference, both in attitudes toward drinking during pregnancy and in the drinking behaviors (Schmid, 1973; Gurel, 1976).

Changes in drinking behavior have also been reported following public education about the risks of alcohol use during pregnancy. At the University of Washington in Seattle, researchers found a marked decrease in alcohol use among pregnant women studied in 1980-81 as compared with a similar group studied in 1974-75. The 1980-81 study followed three years of intensive public education about FAS in the Seattle area s well as increasing national publicity. The greatest drop-off occurred among college-educated and professional women, suggesting they may have had more access to information about FAS (Lowmann, 1982).

Education of all women, regardless of the intensity of their drinking, is vital to permit them the opportunity to make informed decisions which will hopefully lead to better pregnancy outcomes.

Some researchers suggest that education about the negative effects of alcohol use during pregnancy should begin in late elementary school and continue through college (Ouelette, 1984). Such an approach takes advantage of fertile developmental stages in both logic and attitudes, as well as the accessibility of both male and female youth to the educational process.

According to the Center for Disease Control, as many as one in six women in the peak childbearing years of 18 to 34 may drink heavily enough, either chronically or on a binge basis, to prevent clear danger for FAS/FAE to an unborn infant (1983).

According to Gurel (1976), the teenagers most vulnerable to early pregnancy are those who lack healthy self-esteem and who engage in irresponsible behavior due to lack of satisfying decision-making skills. These same developmental shortfalls have long been considered high risk factors for alcohol and drug abuse (Governor's Council on Drug and Alcohol Abuse, 1975).

Gurel urges teachers to enrich normal classroom activities and to enhance vulnerable students' self-esteem by encouraging

activities in which students can:

1. Learn something new.
2. Feel useful by helping someone more vulnerable than oneself.
3. Derive pleasure from recognition for effort and/or accomplishment.
4. Achieve instant gratification through productive activities.

All teen and pre-teen students are vulnerable to some degree. They all need exercise in self-esteem development and in decision-making skill. Educational activities can be testing grounds for them, where they can take minimal risks while learning to make decisions. If they do not get this practice in an educational setting, learning about FAS/FAE through trial and error can be tragic. A baby with birth defects does not get a second chance because a parent was uninformed and unskilled in making decisions.

IDENTIFICATION AND INTERVENTION

Early identification and intervention with women of all ages with alcohol problems is urgent. Helping an alcohol-abusing woman to become abstinent before pregnancy is the ideal. Helping an alcohol-abusing pregnant woman is an emergency.

Anyone who interacts with her -- family, friends, social workers, teachers, counselors, and employers -- plays a role. But often, because of the peculiar medical consequences for the unborn child, intervention at this time becomes the special province of the prenatal care-giver.

As Rosett (1980) states, "Obstetricians, family practitioners, nurses and others who work with pregnant patients must learn to identify and treat those women in their own practice who drink heavily...The health care giver must recognize his/her responsibility to his/her patients for early identification, counseling and referral".

How can a caregiver identify a pregnant woman drinking heavily enough to pose a serious risk to her child? Suggesting that the "only reliable way to identify those pregnant patients who drink heavily is by incorporating a systematic drinking history as a regular part of every prenatal history" (Rosett, 1980; Gurel, 1976; Schmid, 1973). Heavily drinking women cannot be recognized by appearance of socioeconomic characteristics. Dr. Rosett also states, "that despite traditional pessimism about treatment of alcoholics", pregnant women are very responsive to intervention (1980). The pregnancy itself may serve as the necessary crisis, because most pregnant women, despite their own personal problems, experience strong feelings of responsibility for the fetuses they carry (Goeringer & Morosco, 1983). This may

assist them in developing motivation for cooperation with sensitive and supportive alcoholism treatment.

At Boston City Hospital, intervention with pregnant alcohol abusers has been successful, resulting in significantly less growth retardation among infants born to mothers who reduced their alcohol consumption before the third trimester (Rosett, 1980).

Other clinical researchers, notably Little in Seattle and Sokol in Cleveland, have also discovered the necessity of using formal alcohol screening procedures with pregnant patients. In King/Pierce Counties, Washington, Little discovered (after introduction of formal screening techniques) that incidence of pregnancies at risk from excessive alcohol use was 10% (Little, 1979). Those results were supported by Sokol's studies at Cleveland Metropolitan General Hospital. Case Western Reserve University. After instituting formal alcohol screening methods, Sokol found that the actual incidence of alcohol abuse in pregnant patients was 8 to 10%. He contends that the diagnosis is regularly being missed in at least three or every four alcohol-abusing pregnant patients, and that it is "unlikely that there is any other OB/GYN diagnosis that is missed as often" (Sokol, 1980).

Intervention with pregnant teens who may also be drinking is

critical. In many cases, school personnel, rather than prenatal caregivers, will be the first line of intervention. A teacher, guidance counselor, nurse, or student may be the first to be aware of a teen's pregnancy. Sometimes, she may be denying the pregnancy, even to herself, with the result of no early prenatal care. A drinking problem, whether of the binge or the dependency variety, will compound the denial and the danger to both fetus and mother.

School personnel who discover such a situation are urged to consult their in-school drug/alcohol or student advisor, and community drug and alcohol prevention and treatment centers. The intervention process must strike a delicate balance between the expression of understanding concern for the young mother and recognition of her responsibility to herself and to her child. While she is in treatment both for the alcohol problem and for the pregnancy, she will need support and encouragement.

NETWORKING FOR PREVENTION

It is obvious that the attack on a problem of the magnitude and complexity of FAS/FAE cannot be waged by one person, one profession, or one organization. It requires a network of cooperation among all those who have an opportunity to educate women of child-bearing age and/or to identify, intervene, or treat alcohol-abusing women.

FAS/FAE is a major human problem for which prevention is possible. Federal and State schools, with the assistance of their local drug health prevention, intervention, and treatment programs and reproductive health programs, can provide the impetus to make the difference for their students. The final result will be better beginnings for infants, without fetal alcohol effects.

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STUDENT MATERIALS

Students Objectives for Fetal Alcohol Syndrome Effects Workshop

Behavioral Objectives:

At the conclusion of this program, the participant will be able to:

1. Identify patients at risk for Fetal Alcohol Syndrome.
2. Explain the effects of FAS.
3. Differentiate interventions used in preventing FAS from occurring.
4. Propose intervention(s) for a high risk woman.
5. Prioritize care given to a FAS infant and its mother.
6. Propose a procedure which may be helpful in identifying and assessing a FAS infant and its mother.

EARLY HISTORICAL WARNINGS ABOUT ALCOHOL AND PREGNANCY

ISRAEL In the Old Testament, a messenger angel spoke to Samson's mother, "Behold, thou shalt conceive, and bear a son, and now drink no wine or strong drink." Judges 13:7.

ANCIENT CARTHAGE All the guests at the wedding could celebrate and drink wine, except the bridal couple, because of the fear of conception of a deformed child.

BABYLONIA Pregnant women were told, " One who drinks intoxicating liquor will have ungainly children." Talmud (Kethuboth 32b)

GREECE Plato, the Greek father of Western philosophy, suggested that, in the " ideal state " which he would like to create, drinking alcohol should be forbidden to " any man or woman who was intending to create children " because " it is quite hard to tell just what night or day the child will be conceived...children shouldn't be made in bodies saturated with drunkenness." Plato, Laws.

(Transparency 1)

MODERN HISTORICAL WARNINGS ABOUT ALCOHOL AND PREGNANCY

18th CENTURY

1726 England — Cheap gin floods the country. Birth rates drop, and infant deaths increase. The College of Physicians petitions Parliament to control the distilling trade because parental drinking is " a cause of weak, feeble, and distempered children."

1787 America — Dr. Benjamin Rush spoke out against alcohol use by pregnant women because he feared the development of alcohol dependency (addiction) in the child.

19th CENTURY

1834 England — A report to the British House of Commons warned that babies of alcoholic mothers sometimes had a " starved, shrivelled, and imperfect look."

1849 England — Dr. William Carpenter of the University of London reported on impaired mental development in the offspring of alcohol abusers.

1899 England — Dr. William Sullivan published first recognized scientific report on fetal alcohol effects. Of the pregnant, alcohol-drinking women he studied, 50 percent of the babies were dead by the age of two years, usually because of convulsions.

(Transparency 2)

ALCOHOL AND PREGNANCY IN THE 20TH CENTURY

1910 Finland — Dr. Taav Laitenen studied 20,000 infants born to his patients. He observed that drinking alcohol (especially more than one beer/day) was connected with low birthweight.

1923 England — Dr. A. McIlroy observed that alcohol goes through the placenta. "Alcohol is a poison and the fetus of a chronic alcoholic mother is itself a chronic alcoholic, absorbing alcohol from the mother's blood and subsequently from her milk."

1957 France — J. Rouquette filed a thesis at the University of Paris clearly describing malformations, growth problems and poor development of children whose mothers were alcoholics.

1968 France — Dr. Lemoine published a report of 127 children of alcoholic mothers. All these children had similar neurological problems, growth retardation, and facial characteristics.

(Transparency 3)

1973 United States Drs. Smith, Jones, and others of the University of Washington publish a report naming FETAL ALCOHOL SYNDROME and describing the growth retardation, central nervous system damage, and facial deformities associated with it. Their well-documented research indicated that the cause of these problems was maternal alcohol ingestion during pregnancy. These doctors had never read the Rouquette or Lemoine reports which had come to the same conclusions.

1981 United States Surgeon General's Advisory warns pregnant women to avoid alcohol.

1982 United States The American Medical Association issues a report noting "a positive correlation between maternal alcohol consumption and risk of fetal abnormality." The evidence is clear that a woman who drinks heavily during pregnancy places her unborn child at substantial risk for fetal damage and physical and mental deficiencies. The safest course is abstinence."

1983 The World Research continues all over the world into the incidence, the mechanisms, the risks, and the prevention of Fetal Alcohol Syndrome and Fetal Alcohol Effects. (Transparency 4)

DECISION-MAKING/COPING MODEL

1. Identify and define the problem.

2. Gather information relevant to the problem.

3. Brainstorm alternative solutions.

4. Consider the possible consequences of all alternatives.

5. Express awareness of internal and external "Human Factors" influencing the decision-maker.

6. Use effective strategies to cope with those factors.

7. Make a decision, choosing from the alternatives considered, and act.

8. Evaluate the decision.

(Transparency 5)

IDENTIFICATION AND PREVENTION OF FETAL ALCOHOL SYNDROME (CLASS NOTES)

1. What are the criteria for diagnosis of Fetal Alcohol Syndrome?
   Minimal Criteria: abnormalities in three areas.

   a) Prenatal and/or Postnatal Growth Retardation
      Weight, length, and/or head circumference below 10th percentile.

   b) Central Nervous System Involvement
      (neurologic abnormality, developmental delay, or intellectual impairment)

   c) Characteristic facial dysmorphology
      (small palpebral fissures, poorly developed philtrum, microcephaly, flat maxillary area, thin upper lip)

   d) In addition to the diagnostic signs, there are associated non-specific abnormalities including cardiac murmurs and septal defects, genitourinary anomalities and skeletal malformations. The term "Fetal Alcohol Effects" (FAE) should be used in the absence of the full syndrome (Rosett, 1980).

2. How do you define a heavy drinker?
   Consumption of 5 or more drinks on some occasions with at least 45 drinks per month.

3. Is there a brief format to identify heavy drinking?

TEN QUESTIONS

Beer: How many times per week _____.
How many cans each time _____.
Ever drink more?_____.

Wine: How many times per week_____.
How many glasses each time_____.
Ever drink more?_____.

Liquor: How many times per week_____.
How many drinks each time_____.
Ever drink more?_____.

Has your drinking changed during the past year?

CLASS NOTES CONTINUED

4. How do you treat pregnant women who drink heavily?

   . Assess drinking patterns

   . Explain psychopathology and ego strengths

   . Recognize pregnancy as a 'normal crisis' with changing physiology, body image and social role.

   . Utilize mother's concern for unborn to engage her in support of psychotherapy

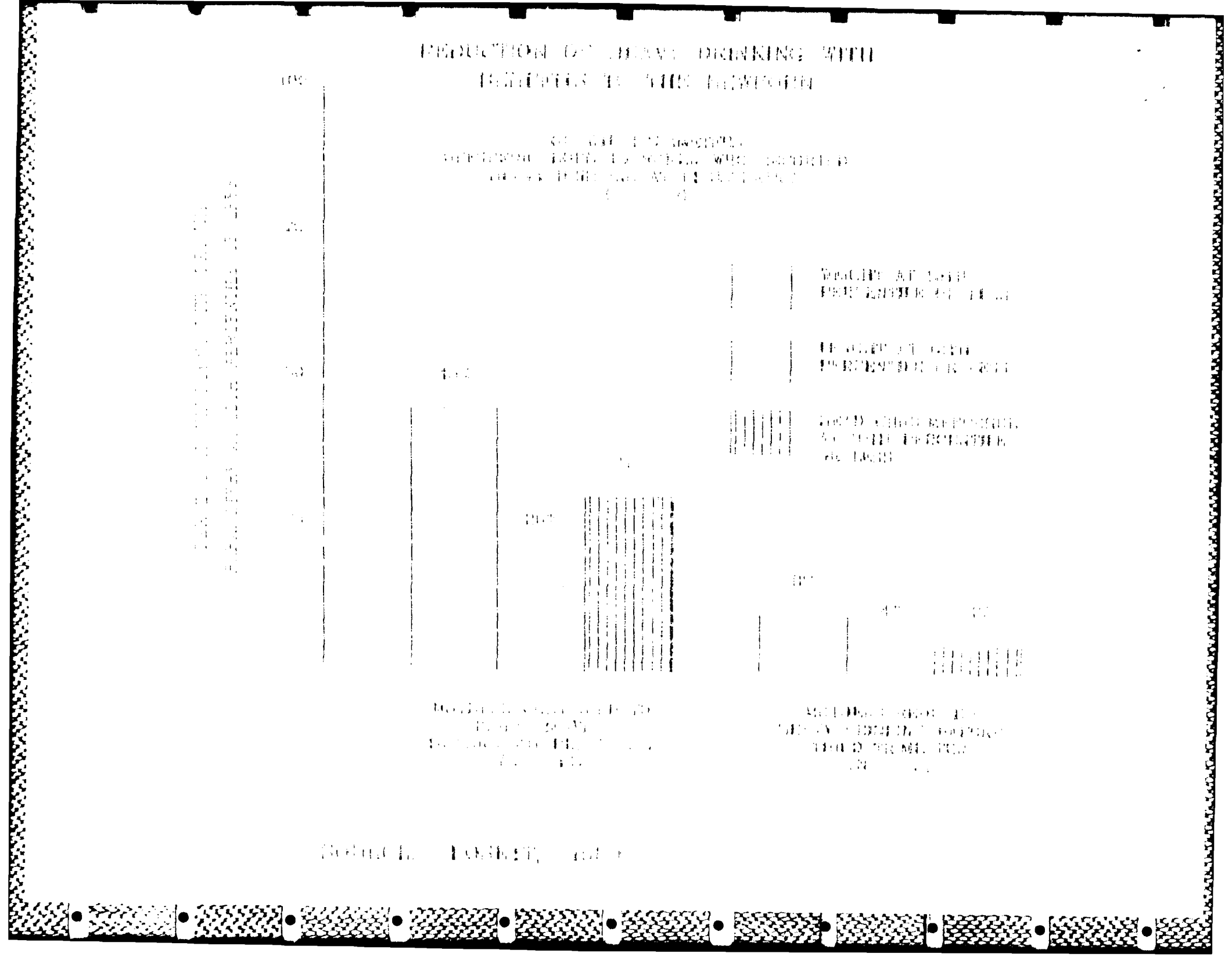
   . Avoid guilt provoking criticism

   . Assist with real social problems

   . Avoid disulfiram (Antabuse) and other potential teratogens

   . Withdraw alcohol gradually if tolerance has developed

5. Are there benefits of reduction? (see chart on next page)



THE ALCOHOL SYNDROME/EFFECTS UNIT PRE-TEST

Name_____Date_____

DIRECTIONS: You will have 10 minutes to complete this pre-test. The same test will be given at the end of the unit for comparison.

Read each statement carefully. If you believe the statement is true, circle the " T " to the left of the statement. If you believe the statement is false, circle the " F " to the left of the statement.

T F 1. When a pregnant woman drinks, the baby is protected from the drug by the placenta, which filters the mother's blood.

T F 2. Mothers who drink a lot of alcohol during pregnancy usually have very large babies because of the extra calories.

T F 3. In the United States, about one baby in every 750 live births has a condition known as Fetal Alcohol Syndrome (FAS).

T F 4. In July, 1981, the Surgeon General of the United States advised pregnant women to limit alcohol use to no more than two (2) drinks per day.

T F 5. According to a list of symptoms issued to healthcare providers in 1980, babies with Fetal Alcohol Syndrome always have brain damage.

T F 6. Because alcohol relaxes blood vessels, when a pregnant woman drinks alcohol, her baby gets a higher than normal supply of oxygen to the brain.

T F 7. If two mothers drink exactly the same amount of alcohol, their babies will have exactly the same fetal alcohol effects.

T F 8. Fetal Alcohol Syndrome and other fetal alcohol effects can result from 'binge' drinking as well as from daily drinking.

T F 9. If a breastfeeding mother drinks alcohol, the alcohol will pass through her milk to the baby.

T F 10. Drinking alcohol regularly can make a man more masculine because it increases his supply of male sex hormone.

11. On the line below, write the name of at least one local resource (agency, counselor,etc.) where teens can go for confidential information and/or assistance about a personal or family alcohol/drug problem.

_____

12. On the line below, write the name of at least one local resource (agency, counselor, etc.) where teens can get medical care related to reproductive health and/or pregnancy.

_____

PERSONAL ATTITUDE INVENTORY

DIRECTIONS: Read each statement below, and based on your personal attitudes, place a check mark in the space which most accurately describes your true feeling about the statement. Be honest. You don't have to turn this paper in, but you do need to keep it until the end of the program.

	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
1. Most people feel a lot more comfortable talking to someone at a party after they have had a few beers.	___	___	___	___	___
2. If a teenager doesn't drink alcohol at parties, other kids make fun of him/her.	___	___	___	___	___
3. Alcohol is good for sexuality.	___	___	___	___	___
4. It's hard to say, "No," to drinking alcohol when all your friends are doing it.	___	___	___	___	___
5. If a person isn't an alcoholic, getting drunk once in a while is harmless.	___	___	___	___	___
6. A true friend will cover for a friend who has alcohol/drug problems so he/she doesn't get caught in school.	___	___	___	___	___
7. High school girls don't have alcohol problems.	___	___	___	___	___
8. A lot of high school girls and guys combine alcohol/drugs and sex.	___	___	___	___	___
9. Both parents have responsibility to contribute to a healthy baby.	___	___	___	___	___
10. If a couple is planning to have a baby, they shouldn't drink or use drugs, even before they know for sure.	___	___	___	___	___

	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
11. Teen pregnancy doesn't happen very often in this day and age.	____	____	____	____	____
12. Pregnant women should have one glass of wine every day to keep relaxed.	____	____	____	____	____
13. A true friend would tell a pregnant friend about pregnancy risk factors.	____	____	____	____	____
14. Having a baby with birth defects and mental retardation would be difficult to deal with.	____	____	____	____	____
15. There is no sense telling a pregnant woman who drinks alconol to stop.	____	____	____	____	____

Adapted from: Chappel,J., Veach,T.L., & R.S. Krug (1985). The substance abuse attitude survey: An instrument for measuring attitudes. Journal of Studies on Alcohol,46 (1),48-52.

VOCABULARY SHEET

Directions: Five terms are assigned to each group. For each term:

a. Write a brief definition in your own words.

b. Look up the word in the dictionary and write the definition.

It will be interesting to compare the two definitions. In many cases you may find that your own words are correct and may be easier to understand. The dictionary definition should add some detail and exactness. BE SURE TO WRITE YOUR OWN WORD DEFINITION FIRST BEFORE YOU USE THE DICTIONARY.

GROUP 1

1. Beverage alcohol

   a)

   b)

2. Diagnosis

   a)

   b)

3. Fetus

   a)

   b)

4. Growth retardation

   a)

   b)

5. Reproductive system

a)

b)

GROUP 2

6. Anomalies

a)

b)

7. Central nervous system

a)

b)

8. "Binge" drinking

a)

b)

9. Miscarriage

a)

b)

10. Placenta

a)

b)

GROUP 3

11. Criterion, criteria (pl.)

    a)

    b)

12. Mental retardation

    a)

    b)

13. Pregnancy

    a)

    b)

14. Syndrome (as related to health/medicine)

    a)

    b)

15. Teratogen

    a)

    b)

GLOSSARY OF TERMS

ABNORMALITIES; MALFORMATIONS

. Patterns of development different from the usual.

ALCOHOLISM

. A progressive, chronic disease, with physical and psychological dependence on the drug, alcohol. Some of its symptoms include: lack of control over excessive drinking of alcohol; psychological and social problems related to the drinking; physical damage to central nervous, gastro-intestinal, cardio-vascular, reproductive and other systems. It is difficult to clearly define 'excessive drinking' due to individual differences, but an average sometimes used is that drinking four or more average size alcoholic drinks (1 1/2 oz. liquor; 5 oz. wine; 12 oz. beer) on a daily average is considered 'excessive drinking'.

BLOOD ALCOHOL CONTENT

. The number of alcohol molecules found in 100 ml of blood, expressed as percentage per concentration.

CARDIAC MURMURS

. Abnormal heart sounds.

CIRCUMFERENCE

. The measurement of the distance around a circle (for example, the head).

DYSMORPHOLOGIST

. A doctor specializing in study of abnormalities in pre-and post-natal development; a specialist in birth defects.

FETAL

. Having to do with the unborn child, especially after the 8th week of pregnancy; EMBRYONAL or EMBRYONIC is sometimes used to refer to weeks 0-8.

FETAL ALCOHOL SYNDROME (FAS)

. A pattern of abnormalities occurring in some children of women who drink alcohol during pregnancy. Its main symptoms are: growth retardation; central nervous system damage; and facial deformities.

FETAL ALCOHOL EFFECTS (FAE)

. Abnormalities less than the complete pattern of FAS, occurring in some children of women who drink alcohol during pregnancy.

MAXILLARY

. Having to do with the bone of the upper jaw.

MICROCEPHALY

. Abnormal smallness of the head and brain; usually with mental retardation.

MINIMAL BRAIN DYSFUNCTION (MBD)

. Classification of neurologic abnormalities,e.g., hyperactivity, poor attention span, cognitive and perceptual problems, etc.

NEONATAL

. Having to do with a baby in the first 28 days after birth.

NEUROLOGIC

. Having to do with the nervous system, including the brain.

NIAAA

. The National Institute on Alcohol and Alcohol Abuse.

NIDA

. The National Institute of Drug Abuse.

PALPEBRAL FISSURES

. The openings or slits between the eyelids.

PHILTRUM

. The vertical groove on the face between the nose and the lip.

POSTNATAL

. Occurring after birth.

PRENATAL

. Existing or occurring before birth.

RENOGENITAL

.Having to do with the kidneys and reproductive organs.

SEPTAL DEFECTS (CARDIAC)

. Abnormalities (often small holes) in the wall separating the chambers of the heart.

10th PERCENTILE

. A statistical point whose value is less than that of 90 per cent of the sample or higher than 9 per cent of the sample.

PLEASE ADD NEW WORDS AND MEANING AS THEY COME UP IN CLASS.

2. Past, Present, and Future

Karen is a high school senior. Her Mom and Dad are divorced. Her Dad is an alcoholic, but is sober now. He lives pretty far away, though, and she doesn't see him much.

Karen is a good student and has always been busy with a lot of activities and her job. In fact, sometimes, trying to keep up with everything and get good grades so she can get a college scholarship, is just a lot of pressure.

Karen has discovered that having some wine or a Bloody Mary sometimes helps her relax and forget about all those pressures for a while. She's not a heavy partyer, but she has started drinking in her bedroom to help her get to sleep at night.

Now Karen is scared. She can't got to sleep without drinking, and she feels even more uptight in the day than she ever did.

She remembers what her Dad was like when he was drinking. She never wanted to be like him. She wants to have a happy life-- with a career, a husband, and children. But she wonders if she is doomed -- " like father, like daughter."

What can Karen do to help herself?

3. To Party or Not to Party?

Jane is 18 and a checkout clerk at a supermarket. She and John, a 21 year old college student, got married last June after her graduation.

Jane doesn't drink alcohol every day, but she and John party almost every weekend. "We deserve some fun after slaving over that cash register and those books. Everyone we know is partying so why shouldn't we?"

Jane and John hope to have children -- but later, after John gets a good job. But, after some of those parties, Jane isn't too sure about their contraceptive measures.

Now Jane's period is late. She waiting every day for her period to start, but she hasn't had the nerve to tell John of the possibility.

Today starts Homecoming Weekend -- beer blasts Friday and Saturday and a formal champagne brunch for alumni and seniors on Sunday. Jane heard on the radio last week that alcohol can hurt unborn babies, but she doesn't even know if she's really pregnant. She talked to her best friend about it, and Sue told her that she heard you had to be a "falling-down drunk" for beer to hurt your baby at all. Anyway, what would John and the rest of the crowd say if she doesn't join in the partying?

What can/should Jane do about partying this weekend?

4. His Brother's Keeper?

Arnold is a high school senior. His older brother, George called him today to tell him the good news -- George's wife is pregnant! They're having a party tonight to celebrate.

When Arnold shows up at the party, he arrives in time to see George, a football fanatic, break out a keg of beer to toast what he hopes will be his middle-linebacker son. He draws a large mugful for his pregnant wife-- after all, on TV all football jocks drink beer! His son might as well get an early head-start!

Arnold knows about fetal alcohol syndrome and effects. He just finished a drug and alcohol unit in health class.

What can/should Arnold do?

5. New Baby in the House

Bob is 15. He's pretty excited having a new baby brother, even though sometimes he feels like his Dad and stepmother focus all their attention on the two week old baby. He and his dad were alone together for a lot of years.

Bob is worried about something though. He's noticed that his stepmother always seems to have a glass of beer or wine every time she sits in the rocker to breastfeed little Matthew.

Bob's class had a guest speaker last week who talked about alcohol and pregnancy. "Mom" didn't drink any alcohol while she was pregnant, but Bob wonders if drinking now while she is breastfeeding Matthew is OK.

What can/should Bob do?

THE ALCOHOL SYNDROME/EFFECTS UNIT POST-TEST

Name_____Date_____

DIRECTIONS: You will have 10 minutes to complete this pre-test. The same test will be given at the end of the unit for comparison.

Read each statement carefully. If you believe the statement is true, circle the " T " to the left of the statement. If you believe the statement is false, circle the " F " to the left of the statement.

T F 1. When a pregnant woman drinks, the baby is protected from the drug by the placenta, which filters the mother's blood.

T F 2. Mothers who drink a lot of alcohol during pregnancy usually have very large babies because of the extra calories.

T F 3. In the United States, about one baby in every 750 live births has a condition known as Fetal Alcohol Syndrome (FAS).

T F 4. In July, 1981, the Surgeon General of the United States advised pregnant women to limit alcohol use to no more than two (2) drinks per day.

T F 5. According to a list of symptoms issued to healthcare providers in 1980, babies with Fetal Alcohol Syndrome always have brain damage.

T F 6. Because alcohol relaxes blood vessels, when a pregnant woman drinks alcohol, her baby gets a higher than normal supply of oxygen to the brain.

T F 7. If two mothers drink exactly the same amount of alcohol, their babies will have exactly the same fetal alcohol effects.

T F 8. Fetal Alcohol Syndrome and other fetal alcohol effects can result from 'binge' drinking as well as from daily drinking.

T F 9. If a breastfeeding mother drinks alcohol, the alcohol will pass through her milk to the baby.

T F 10. Drinking alcohol regularly can make a man more masculine because it increases his supply of male sex hormone.

11. On the line below, write the name of at least one local resource (agency, counselor,etc.) where teens can go for confidential information and/or assistance about a personal or family alcohol/drug problem.

_____

12. On the line below, write the name of at least one local resource (agency, counselor, etc.) where teens can get medical care related to reproductive health and/or pregnancy.

_____

DIRECTIONS: List the steps in the decision-making model used in class.

13. Step 1 --

14. Step 2 --

15. Step 3 --

16. Step 4 --

17. Step 5 --

18. Step 6 --

19. Step 7 --

20. Step 8 --

NON-GRADED QUESTIONS

21. List two important facts learned during the program which you did not know before.

    1.

    2.

22. What (if any) changes in your attitudes or feelings about alcohol use and reproduction/pregnancy can you say resulted from this program?

23. Was this program helpful to you in terms of how you may act in the future if you are in a situation involving alcohol use and reproduction/pregnancy? Explain your answer.

FETAL ALCOHOL SYNDROME & EFFECTS

TEACHING EVALUATION TOOL

Rate on a four-point scale from **A** (Very High) to **D** (Very Low) this presenter's performance. If you cannot remember or the item is not applicable, mark **E**. Please do not put your name on this sheet.

Organization:

_____ 1) Ensure that appropriate behavioral objectives are developed.

_____ 2) Presenter's expectations of student performance are clear.

_____ 3) Acts as a resource person to students.

_____ 4) Sets the stage for group discussion.

_____ 5) Ensures that major points are identified throughout the class.

_____ 6) Ensures that major points are summarized at the end of the program.

Content:

_____ 7) Ensures that unfamiliar terms/terminology are clarified.

_____ 8) Ensures introduction of relevant literature both classic and current into discussion of topic.

_____ 9) Ensures that stated behavioral objectives are met.

Delivery: (**A** - Very High to **D** - Very Low; **E** - Can't remember or not applicable).

_____ 10. Ensures group discussion by using relevant thought provoking comments and questions.

_____ 11. Prevents discussion from being dominated by a few persons.

_____ 12. Allows free discussion of ideas by others.

_____ 13. Ensures that materials are presented in a well organized manner providing a sense of unity and structure.

Overall Evaluation:

_____ 14. Overall, how much did you learn from this presenter?

_____ 15. Overall, how would you rate this program?

Source: University of Maryland at Baltimore, School of Nursing

FETAL ALCOHOL SYNDROME & EFFECTS

COURSE EVALUATION FORM

Please rate this course on a scale of 1 to 4, where 1= strongly agree, 2= agree, 3= disagree, and 4= strongly disagree. Circle **N** if not applicable.

1. My clinical practice will be improved as a result of this program.

   1 2 3 4 N

2. The amount of material presented in this course was about right.

   1 2 3 4 N

3. This course was relevant to my area of clinical practice.

   1 2 3 4 N

4. My expectations for this course were met.

   1 2 3 4 N

5. The audiovisual aids enhanced the course presentation.

   1 2 3 4 N

6. Facilities were conductive to learning.

   1 2 3 4 N

7. I would recommend this course to others.

   1 2 3 4 N

8. How did you hear about this course?

9. Please add comments or suggestions:

Source: University of Maryland at Baltimore, School of Nursing

RESOURCES

AUDIOVISUALS -- Free Loan

ENCORE - ODAP (Free Loan)
Box 2773
Harrisburg, PA 17105
(800) 932-0912

The following are listed in the ENCORE Guide to Audiovisuals:

. Alcohol : Crisis for the Unborn (1978) -- 8 min, 16mm, March of Dimes

. Alcohol: Pregnancy and the Fetal Alcohol Syndrome (1982) --46 slides
35 mm slide teaching unit for medical professional training
Developed at Dartmouth Medical School for Operation Cork

. Born Drunk (1979) -- 10 min,16 mm
Fetal Alcohol Syndrome -- from 20/20 show of ABC

. Fetal Alcohol Syndrome (1979) -- 19 min, audiocassette only
Discussion for health professionals - From Addiction Research Foundation, Toronto, includes 7 pp. outline

. One For My Baby (1982) -- 28 min, 16 mm
Fetal Alcohol Syndrome, from University of Wisconsin

. Right from the Start (1981) -- 9 min, slide and audiocassette kit.
Told from the viewpoint of healthy newborn infant

AUDIOVISUALS -- Purchase

Operation Cork
8939 Villa La Jolla Dr., Suite 203
San Diego, CA 92037
(712) 452-5716

. Alcohol and the Physician (1981)--4/20 min, films - total 80 min.
Teaching films for medical groups, eligible for CME.
Film =1 Attitudes (20) min
Film =2 Early Diagnosis (20) min
Film =3 Initiating Treatment (20) min
Film =4 The Physician's Role in Rehab (20) min

REPRINTS

. "The Fetal Alcohol Syndrome," Alcohol Resource List: Update. (NIAAA)

. "Sex-Related Alcohol Effects," Alcohol Resource List: Update. (NIAAA)

. "The Effects of Alcohol on Pregnancy Outcome" from The Fifth Special Report to the U.S. Congress on Alcohol and Health. (NIAAA)