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Investigation of Seminal Plasma Hypersensitivity Reactions

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Since returning from the Persian Gulf War (PGW) veterans and/or their wives have reported burning after contact with their semen. This has been called Burning Semen Syndrome (BSS). These reactions bear striking resemblance to reactions experienced by women with localized vaginal seminal plasma hypersensitivity. This project is attempting: 1) to identify PGW couples experiencing BSS; 2) to determine whether these symptoms represent an immunologic, infectious and/or toxicologic etiology; and 3) to determine if there is a causal relationship between BSS and PGW exposures. Screening questionnaires, designed to elicit demographic information, nature of symptoms, Gulf War exposure history and information on post-traumatic stress disorder (PTSD), were distributed to PGW veterans with BSS symptoms. PGW veterans were primarily identified by local and regional Gulf War screening physicians and through a BSS web page on the Internet. There were 46 male respondents. 41 of 46 respondents had sexual partners with vaginal burning after semen contact whereas 15 males experienced burning after contact with their own semen. There was no correlation between BSS and PTSD. Five PGW veterans and their sexual partners had a more extensive evaluation including CBC, differential, chemistries, liver function tests, ANA, sedimentation rate, vaginal/cervical or seminal plasma cultures, skin testing to seasonal and perennial aeroallergens and whole seminal plasma, and specific IgG, IgA and IgE antibodies to seminal plasma proteins by ELISA. Four males and two females were atopic. None elicited a positive skin test or specific antibodies to seminal plasma proteins. Three women grew ureaplasma urealyticum from their cervical cultures, one grew streptococcus Group B, and one Candida. Two women had positive ANA titers (≥ 1:80 titer) and one had an increased sedimentation rate of 65 sec. Larger numbers of PGW veterans and their sexual partners with BSS are currently being evaluated to differentiate between immunologic and infectious etiologies.
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I. Introduction:

Persian Gulf War (PGW) Veterans and/or their sexual partners have been experiencing burning, pain and swelling of the urogenital tract after exposure to semen since returning from the Persian Gulf. This phenomenon has been referred to as “Burning Semen Syndrome” (BSS). The primary objective of this research project is to identify and evaluate PGW veterans and their sexual partners with BSS. The secondary objective of this proposal is to determine if the underlying mechanism(s) of BSS is immunologic, infectious and/or toxicologic in nature. The third objective is to determine if the onset of BSS is related to chemical and/or biologic exposures encountered by PGW veterans during their tour of duty in the Persian Gulf. The fourth and final objective is to identify potential treatment(s) for BSS.

Seminal plasma protein reactions in civilian populations of women have been previously well described. Women who experience postcoital anaphylaxis have been demonstrated to produce specific IgE antibodies to seminal plasma proteins. Women who have been successfully desensitized using homologous relevant seminal plasma protein antigens obtained from their sexual partner. Subsequently, women experiencing localized vaginal inflammation, characterized by burning and pain and occurring immediately after contact with their sexual partner’s semen, were also successfully treated with seminal plasma protein desensitization. This suggested that some postcoital localized vaginal reactions may be IgE-mediated. A recent questionnaire survey distributed to 1,073 women who suspected they might have symptoms consistent with localized or systemic seminal plasma protein hypersensitivity revealed that 12% fulfilled the diagnostic criteria. This survey indicates that seminal plasma hypersensitivity reactions are more common than previously reported. The initial hypothesis of this project postulated that BSS occurred secondary to specific IgE antibody responses to one or more seminal plasma proteins. This hypothesis was based on observations that some women who were diagnosed and successfully treated for localized vaginal seminal plasma hypersensitivity, experienced similar reactions. Therefore, our clinical experience investigating seminal plasma hypersensitivity in civilian female populations provided a foundation for the current investigation of PGW veterans and their sexual partners with BSS.

The first year activities focused on identifying the scope of this problem. This has required establishing contacts with: 1) PGW veterans with and without BSS; 2) Gulf War screening physicians at local and remote Veterans Administration Hospitals; 3) veterans organizations such as the American Legion, AmVets, and Veterans of Foreign Wars and; 4) other advocates of PGW veterans. A significant amount of time was devoted to publicizing this project to the news media in order to inform the general public and PGW veterans about BSS. Several magazines (i.e. Men’s Health, Science News, Playboy...) and newspapers published reports on BSS. Major radio and television news wires (i.e. Reuters, NBC) aired stories regarding BSS. This media exposure has successfully heightened the public’s awareness of BSS and our investigation of this problem in PGW veterans. Many PGW veterans with symptoms suggestive of BSS subsequently expressed interest in participating in this project.
II. Body:

A. Experimental Methods/Procedures

Questionnaires:
A web page was established on the internet to identify PGW veterans deployed to the Persian Gulf with and without BSS (see Appendix 1). The web page includes two questionnaires (see Appendix 2) to be completed by the PGW veteran and his sexual partner. These questionnaires can then be transmitted back to our site by E-mail. Questionnaires #1 and #2 were also mailed to the 120 PGW veterans who were previously screened at the Cincinnati VAH Gulf War clinic for general health problems. All individuals who responded to the screening questionnaires were sent more detailed questionnaires to further elucidate details about their symptoms (see Appendix 3). Separate questionnaires were designed for the male and female. This questionnaire packet also included detailed and included screening surveys for post-traumatic stress disorder (PTSD). These questionnaires have been adapted and modified from other questionnaires which have previously been used to evaluate women with seminal plasma protein hypersensitivity reactions.

Clinical Evaluation of PGW veterans:
Persian Gulf War veterans and their sexual partners consenting to participate in this project are required to undergo screening blood tests and cultures to exclude bacterial, fungal and viral infections or other medical disorders (i.e., diabetes mellitus, chronic yeast infections, prostatitis...) which could be causing or contributing to their symptoms (see Appendix 4). All PGW veterans and their sexual partners are skin tested using the “prick” method to assess their allergic status. Skin testing is performed to box elder (tree), fescue (grass), short ragweed, Alternaria (outdoor mold), Mucor (indoor mold), cat, and dust mite in addition to a positive histamine and negative saline control. A fresh ejaculate is collected from each male at the time of the initial evaluation. A small portion of the ejaculate is used for prick skin testing of the male and female in order to determine if either elicits a hypersensitivity reaction. The remaining portion of the sample is sent for semen cultures outlined in Appendix 4. All females undergo a pelvic examination which includes a pap smear, vaginal and/or cervical cultures as outlined in Appendix 4. Finally, serum is obtained from both the male and female to screen for specific IgG, IgA and IgE antibodies to seminal plasma proteins by ELISA.

Direct Competitive ELISA:
IgG, IgA and IgE ELISA is performed using whole seminal plasma obtained from the PGW male subject and asymptomatic civilian male controls. A Costar flat-bottom, 96-well polystyrene plate (Corning) is coated with 100 µl of seminal plasma protein previously diluted to concentration of 10 µg/ml with 0.15 mol/L NaCl. The plate is incubated for two hours at room temperature with 0.15 mol/L tween-phosphate buffer saline to block for unreacted sites. Both the PGW veteran and their sexual partner’s serum is diluted 1:5 and added in triplicate to the microtiter wells. The plate is allowed to incubate for 24 hours at room temperature. For IgG and IgA antibody detection, alkaline phosphatase conjugated goat anti-human IgG and IgA (Sigma)
respectively, are diluted 1:2000 and added to each well. After the plate incubates for one hour at room temperature, 100 μl of 1 mg/ml p-nitrophenyl phosphate substrate is added to each well. The enzyme reaction is allowed to proceed for 30 minutes and then stopped with KOH. The optical density of each well is measured using a microplate ELISA reader at 405 nm. For IgE antibody detection, goat anti-human IgE (Kirkegard and Perry) diluted 1:1000 is added to each well and incubated for one hour at room temperature. The plate is then washed and alkaline-phosphatase labeled rabbit anti-goat IgG diluted to 1:2000 is added to each well. After the plate incubates for one hour at room temperature, the optical density is determined as described for IgG and IgA isotype specific antibodies.

**Bacteriological Studies:**

Based on our preliminary data (see Results section), we have initiated studies to assess the antibacterial status of whole seminal plasma from PGW veterans. Well characterized strains of *Escherichia coli* and *Streptococcus pyogenes* Group B, were grown in Fair minimal growth medium which supports growth of organisms at 100-fold lower levels than tryptic soy broth. Cultures were grown to a maximum level of approximately $10^8$ colony-forming units/ml for *E. coli* and $10^7$ colony-forming units/ml for group B streptococcus. Zinc at a concentration of 100 μg/ml is used as a bacteriostatic control because of its known role as a prostatic antibacterial factor. Zinc at this concentration inhibits *E. coli* 200-fold or greater and group B streptococcus at least 30-fold. Whole seminal plasma from PGW veterans diluted 1:10 in Fair medium is added to the *E. coli* and Group B streptococcus cultures and colony-forming units are counted.

**Polymerase Chain Reaction for *Ureaplasma urealyticum***:

Based on preliminary findings (see Results section), a PCR technique is being developed to identify the presence of *Ureaplasma urealyticum* DNA in the whole seminal plasma of PGW veterans. Two primers for the urease gene of *Ureaplasma urealyticum* have been obtained from a commercial oligo-preparation company and are the same as published by Krieger, et.al. A probe for the urease gene has been prepared with a 5′ biotin label. *Ureaplasma urealyticum* organisms were obtained from Dr. George Kenny at the University of Washington in Seattle, WA as a positive control source of DNA. Southern blotting is being performed using the biotin-labeled probe to detect the presence of *Ureaplasma urealyticum* DNA in the seminal plasma from PGW veterans whose sexual partner grew out this organism in their cervical culture. It is necessary to resort to a more sensitive method to identify the presence of *Ureaplasma urealyticum* in PGW veterans’ seminal plasma as this organism could not be isolated from culture using special growth media. The presence of this specific probe will be determined by chemiluminescence using the Photo-Gene kit from Life Technologies.
B. Results

Questionnaires:

Responses to template screening questionnaires #1 and #2 from PGW veteran’s and/or their sexual partners are summarized in Appendix 2. Table I summarizes demographic data of PGW veterans who returned either questionnaires #1, #2 and/or the more detailed questionnaire #3. It is evident from Table I that the percentage of respondents completing and returning questionnaires dramatically decreased as the questionnaires became more detailed or addressed sensitive issues such as PTSD (19.5% completion rate). In one instance, a PGW veteran and his wife refused to further participate in the study because they were offended by questions contained in the PTSD screening questionnaire packet (Appendix 2). All of the questionnaire respondents to this point have been male PGW veterans. The average age of the males and their female sexual partners was 35 and 32 years old, respectively. The geographic distribution of PGW respondents around the United States is illustrated in Figure 1. The greatest number of PGW veterans with BSS were located in Ohio which most likely reflects more aggressive local media coverage of this problem and greater cooperation with local and regional VAH Gulf War screening physicians. Many of the subjects were identified through the mailing list and the internet web page.

The initial phase of the study was designed to gather as much information as possible about PGW veterans and their sexual partners experiencing BSS. 42 or 46 respondents completed screening questionnaire #1. The responses to this questionnaire are summarized on a copy of this questionnaire (see Appendix 2). Of these respondents, 41 indicated they did not experience BSS prior to going to the Persian Gulf. 41 indicated that their sexual partner experienced a burning sensation after contact with their semen but only 15 of the PGW veterans experienced burning during or after ejaculation or upon direct contact with their semen. Interestingly, 20 indicated that symptoms abated with use of a condom, 9 continued to have symptoms with a condom and 13 never tried using a condom to prevent symptoms. Only half the respondents had previously sought medical attention for this problem. Nine of the respondents indicated that they had been diagnosed with some type of sexually transmitted disease. The majority of respondents (i.e. 93%) were interested in participating in this study.

Questionnaire #2 is the same questionnaire which has been used to screen civilian populations of women with localized and/or systemic seminal plasma hypersensitivity. This questionnaire has been validated as reliable in detecting women with probable local and/or systemic seminal plasma hypersensitivity reactions. This questionnaire was completed by the sexual partner of 26 PGW veterans. The responses are summarized on a template of questionnaire #2 (see Appendix 2). Many of the respondents complained of systemic symptoms associated with burning and other localized symptoms. One-third of the respondents indicated that their symptoms disappeared with the use of a condom whereas 1/3 indicated that their symptoms persisted and 1/3 never tried using a condom.

Finally, questionnaire #3 was designed to obtain more detailed information regarding the PGW veteran and his sexual partner. The response rate to this questionnaire was lower than the previous two questionnaires. These questionnaire responses are summarized in table II.

A pilot study was completed during year 1 of this project to test the questionnaires and ensure that the evaluation of the PGW couples was well coordinated. The pilot study included
interviews and evaluations of five PGW veterans and their sexual partners with BSS at the Cincinnati Veterans Administration Hospital. One additional PGW veteran was evaluated but his wife refused to participate. The interview included answering the above questionnaires, completing a PTSD questionnaire packet, obtaining blood samples from both the male and female to exclude underlying concomitant disorders such as sexually transmitted diseases (see Appendix IV), a pap smear with vaginal/cervical cultures of the female and a fresh semen ejaculate for skin testing and cultures from the male.

The Mississippi Post-Traumatic Stress Disorder (MPTSD) and Combat Exposure Scale (CES) questionnaires were used to screen for PTSD. Table III summarizes the results of all PTSD questionnaires returned thus far by PGW veterans. Of the PGW veterans evaluated at the Cincinnati VAH, three were considered negative for PTSD, two were possible for PTSD and one was probable for PTSD.

**Clinical Evaluation of PGW Couples with BSS:**

Both males and females were prick skin tested to common seasonal and perennial allergens to determine their atopic status and to the male's whole semen. Four out of the six PGW veterans had evidence of atopy defined as a skin reaction eliciting \( \geq 3 \text{ mm} \) wheal with erythema to one or more allergens. Four of six PGW veterans and two of five female sexual partners elicited at least one positive skin test reaction to an aeroallergen. None of the PGW veterans or their sexual partners exhibited a significant prick skin test reaction to the male's whole semen. The lack of specific *in vivo* antibody responses to seminal plasma proteins was confirmed by *in vitro* ELISA designed to measure specific IgG, IgA and IgE antibodies to seminal plasma proteins. Specific antibodies could not be detected in any of the PGW veterans or their sexual partners.

Pertinent positive results of screening laboratory tests for the PGW male and his sexual partner are summarized in Table IV. Three of five women evaluated grew *Ureaplasma urealyticum* from their cervical culture. Two of these women also exhibited positive ANA titers and one had an increased sedimentation rate. One woman grew *Streptococcus* Group B from her cervical culture and had a chronic vaginal yeast infection. Both the males and females exhibited varying antibody titers to either HSV, CMV or mycoplasma. There did not appear to be a correlation between symptoms and PTSD in the small number of subjects evaluated thus far.

The results of the initial pilot study have indicated several things: 1) the operational procedures for initial screening interviews and laboratory evaluations of the PGW veterans and their sexual partners went smoothly and therefore was successful; 2) the questionnaire responses regarding BSS by the PGW veterans and their sexual partners was variable and their response rate seem to proportionately decrease as the questionnaires became more detailed; 3) there was an even poorer completion rate of the PTSD questionnaire packets; 4) none of the six PGW veterans or their sexual partners elicited positive skin test responses to their semen nor did they produce measurable levels of specific IgG, IgA and IgE antibodies to seminal plasma proteins in their sera; 5) three of the five women evaluated grew *Ureaplasma urealyticum* in their cervical cultures, two had positive ANA titers and one had a high sedimentation rate; and 6) there did not seem to be a correlation between BSS and PTSD among the participants in this pilot study.

Finally, a preliminary abstract was presented at the Society of Toxicology meeting held in Cincinnati, March 1997, pertaining to BSS in PGW veterans and a second abstract has recently been submitted the American Academy of Allergy, Asthma and Clinical Immunology.\textsuperscript{7,8}
III. Conclusions:

Overall, there has been a significant response from PGW veterans complaining of BSS and the total number of respondents has increased since the preparation of this report. Questionnaire responses have uniformly indicated that BSS began after the PGW veterans returned from the Persian Gulf. The female sexual partner is experiencing the burning sensation in the majority of cases but in a number of situations the male PGW veteran also experiences burning after contact with his own semen. Initial assessment of a small group of PGW veterans and their sexual partners indicates that several of the participants have underlying bacterial infections which could be causing or contributing to their symptoms. Some of the subjects exhibit non-specific laboratory abnormalities suggestive of an underlying inflammatory condition which could be consistent with a chronic infection. None of the subjects evaluated thus far exhibited positive skin tests to whole semen or specific IgG, IgA or IgE antibodies to seminal plasma proteins in contrast to what has been reported in women experiencing systemic and/or localized seminal plasma hypersensitivity reactions.

The next phase of this project is to complete evaluation of a larger number of PGW couples (N=50-60) with BSS symptoms to establish an underlying cause for their symptoms. Preliminary data suggests an infectious etiology. It is unclear if PGW veterans are more prone to infections than PGW veterans not deployed to the Persian Gulf or the civilian population. None of the women with documented vaginal infections have thus far been empirically treated for their infection(s) to determine if their symptoms are attenuated or disappear. However, we are planning to treat those men and women with proven infections with appropriate antibiotics to determine if their symptoms improve.

In order to expedite evaluation of this PGW population, it has become evident that a Project Coordinator be employed to act as a liaison between the Principal Investigator and the PGW veterans who wish to participate in this project. This individual will arrange the evaluation of the PGW veterans and their sexual partners either at the Cincinnati VAH or at their regional VAH. This takes a significant amount of time to coordinate. Based on our initial experience, it has been very difficult to identify physicians willing to assist in these evaluations. This individual will also maintain frequent contact with participating PGW couples to update them on the progress of their evaluation and the overall investigation in addition to ensure that questionnaires, laboratory testing and biologic specimens are received in a timely fashion. The project coordinator will also assist in making arrangements for all local evaluations of PGW couples at the Cincinnati VAH. Finally, this individual will maintain and update the data base on a regular basis.

An essential part of this project is to identify and evaluate cohort control populations for comparison with the deployed PGW symptomatic veterans for BSS (i.e. PGW veterans deployed to Persian Gulf without BSS symptoms and PGW veterans not deployed to the Persian Gulf with or without symptoms). This will involve recruiting subjects from nearby military installations (i.e. Wright Patterson Air Force Base in Dayton and local and regional national guard installations). All subjects (PGW couples with BSS and control groups) will be asked to complete questionnaires #1-3, PTSD packets and clinical testing performed on the pilot study participants. Currently, methods are being developed in the laboratory to detect *Ureaplasma*
urealyticum DNA by PCR analysis in the semen of PGW veterans with BSS.\textsuperscript{69} This organism is related to the mycoplasma family of organisms and is often difficult to grow in culture. This might be one explanation why none of the male semen cultures grew out *Ureaplasma urealyticum*. Another explanation is that semen is rich in bacteriostatic and enzymatic proteins which may inhibit growth of organisms in culture thereby making DNA determination the only practical way of detecting the presence of a specific organism.\textsuperscript{69} All future participants will continue to be screened for IgG, IgE and IgA specific antibodies to seminal plasma proteins to exclude an immunologic etiology for BSS.

The most difficult task of this project will be to determine whether or not the onset of BSS is related to exposures by PGW veterans while they were deployed to the Persian Gulf. Exposure data are being obtained on an ongoing basis from the data base of the Deployment Environmental Exposure Program at the Center for Health Promotion and Preventive Medicine using PGW veterans social security numbers and unit identification codes.

All of the previous and future PGW couples evaluated who have been found to have evidence of an active infection will be offered appropriate therapy as a therapeutic/diagnostic means for establishing a linkage with BSS.

To accomplish these tasks the original budget has been reconfigured to hire a Project administrative coordinator, two research assistants to process all biologic specimens, perform all specific antibody immunoassays and conduct other specific experiments directed at finding an underlying cause for BSS. Funds are also necessary to pay for the PGW veteran’s sexual partner’s clinical and laboratory evaluations and control population assessments. All initial evaluations of the PGW veterans with BSS are considered part of their screening evaluation for problems arising since returning from the Persian Gulf and are being paid for by the Veterans Administration Hospital. Funds are also necessary to pay for all expenses incurred by the PGW veteran during their evaluations (i.e. travel, lodging, meals, postage, missed days from work). Restructuring this project in this manner will facilitate the evaluation of larger numbers of subjects and improve the likelihood that an underlying etiology for BSS will be identified.
IV. References:


TABLE I

SUMMARY DEMOGRAPHIC DATA FOR FIRST YEAR REPORT  
(Burning Semen Syndrome Study)

Number of Respondents to Questionnaires 1 &/or 2: 46
Number excluded from study to date 3
(pre-existing symptoms; AIDS; didn't want to participate)  

Total Number of Subjects to date: 43
Persian Gulf War Veteran Gender:
    Male 43
    Female 0

Number reporting no partner 7

Average Age Males
    Age Range Males 26 to 50 35

Average Age Female Partners
    Age Range Females 19 to 57 32

Number completing Questionnaire # 1 42 91.0%
Number completing Questionnaire # 2 26 62.0%
Number completing Questionnaire # 3 for Males 18 39.0%
Number completing Questionnaire # 3 for Females 14 30.0%
Number compelling PTSD Inventory 9 19.6%

The 43 respondents are from the following States:

1 Alabama 3 New Hampshire
1 Arkansas 1 New Mexico
1 California 1 New York
1 Colorado 14 Ohio
1 Florida 3 Oklahoma
1 Hawaii 1 Pennsylvania
1 Idaho 3 Texas
2 Kentucky 1 Virginia
1 Maryland 1 Washington
1 Montana 1 West Virginia
2 North Carolina
<table>
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<th>Question</th>
<th>Response</th>
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<tr>
<td>Average age (Males)</td>
<td>37 years old</td>
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<tr>
<td>Average age (Females)</td>
<td>33 years old</td>
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<tr>
<td>Period stationed in Persian Gulf</td>
<td>8/90-5/91 (represents range of time)</td>
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<tr>
<td>Average length of tour</td>
<td>5.3 months</td>
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<tr>
<td>Location while in Persian Gulf</td>
<td>Iraq, Kuwait and Saudi Arabia (one stayed in United States-Myrtle Beach, S.C.)</td>
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<td>Reported chemical exposures</td>
<td>Diesel fumes, oil fire fumes, petrochemicals and pesticides</td>
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<td>Average length of exposure</td>
<td>5.1 months</td>
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<td>Diagnosis of Leishmaniasis</td>
<td>Yes (N=2); No (N=11); Unknown (N=5)</td>
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<td>Treatment for Leishmaniasis</td>
<td>None (N=2)</td>
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<td>Uranium exposure</td>
<td>Yes (N=6); No (N=7); Not completed (N=5)</td>
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<tr>
<td>Exposure to Biological agents</td>
<td>Yes (N=12); No (N=4); Unknown (N=2)</td>
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<td>Ingestion of Pyridostigmine Bromide</td>
<td>Yes (N=14); No (N=3); Not completed (N=1)</td>
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<tr>
<td>Received Vaccinations</td>
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<td>Diagnosis of Post-traumatic Stress Disorder</td>
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<td>Yes (N=7); No (N=9); Not completed (N=2)</td>
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<td>State of Health prior to PGW</td>
<td>Good to Excellent (N=18)</td>
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<td>Current State of Health</td>
<td>Poor (N=6); Good to Great (4); Multiple symptoms (N=7); Not completed (N=1)</td>
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<td>Sexually transmitted disease</td>
<td>Male: Yes (N=1 post PGW); No (N=17)</td>
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<td></td>
<td>Female: Yes (N=3 post PGW); No (N=11)</td>
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<td>Reaction to Semen (All reactions began after PGW)</td>
<td>Male: Yes (N=12); No (N=6)</td>
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<td></td>
<td>Female: Yes (N=14); No (N=0)</td>
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| Reaction with other partners | Male: Yes (N=0); No (N=18)  
Female: Yes (N=2); No (N=12) |
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<td>Yes (N=4); No (N=10); Not completed (N=2)</td>
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<td>Time of Onset symptoms occur within males</td>
<td>Within minutes (N=9); Within hours (N=2); Not stated (N=7)</td>
</tr>
<tr>
<td>Time of Onset symptoms occur within females</td>
<td>Within minutes (N=10); Within hours (N=2); Not stated (N=6)</td>
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<tr>
<td>Length of time symptoms persist in males</td>
<td>Minutes (N=4); Hours (N=2); Days (N=7); Not stated (N=5)</td>
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<tr>
<td>Length of time symptoms persist in females</td>
<td>Minutes (N=2); Hours (N=2); Days (N=7); Not stated (N=7)</td>
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<td>Systemic symptoms</td>
<td>Males (N=13); Females (N=7)</td>
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<td>Reactions with condom</td>
<td>No (N=6); Yes (N=5); Never used (N=6)</td>
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<tr>
<td>History of vasectomy</td>
<td>Yes (N=2); No (N=16)</td>
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<td>History of infertility problems</td>
<td>Yes (N=3); No (N=15)</td>
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<td>History of Allergies</td>
<td>Yes (N=4); No (N=14)</td>
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<td>Food Allergies</td>
<td>Yes (N=3); No (N=15)</td>
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<tr>
<td>Drug Allergies</td>
<td>Yes (N=3); No (N=15)</td>
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<td>Same sexual partner pre/post PGW</td>
<td>Yes (N=13); No (N=5)</td>
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<tr>
<td>Recurrent vaginal yeast infections</td>
<td>Yes (N=9); No (N=5); Female responses only</td>
</tr>
<tr>
<td>Use of oral contraceptives</td>
<td>Yes (N=1); No (N=13); Female responses only</td>
</tr>
</tbody>
</table>
### Table III
BURNING SEEMEM SYNDROME STUDY SUMMARY OF PTSD FINDINGS

<table>
<thead>
<tr>
<th>FILE NUMBER</th>
<th>MPTSD SCORE</th>
<th>CES SCORE</th>
<th>Neg for PTSD</th>
<th>Possible for PTSD</th>
<th>Probable for PTSD</th>
<th>Questionable PTSD Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1025</td>
<td>101</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>1030</td>
<td>108</td>
<td>15</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>1035</td>
<td>112</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
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<td>1070</td>
<td>81</td>
<td>0</td>
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<td></td>
<td></td>
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<td>X</td>
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<td></td>
<td></td>
<td></td>
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<td>4</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>1170</td>
<td>138</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

### PTSD SCREENING PACKET

1. Participant Information Form -- contains basic demographic information.
2. Physical Symptom Checklist -- asks for information specific to the Gulf War.
3. Combat Exposure Scale (CES) -- seeks information regarding frequency of combat action participation and knowledge of combat violence.
4. Impact of Event Scale (IES) -- relates to recent thoughts and feelings about stressful life events which the respondent has experienced.
5. Mississippi PTSD Rating Scale (MPTSD) -- inventory of statements about how one views oneself and experiences life situations.
6. Coping Strategies Inventory (CSI) -- seeks information about how one handles stressful events.
7. Traumatic Events Screen Inventory (TESI) -- asks for specific information about life events one has actually experienced.
8. The Life Experiences Survey (LES) -- also requests information about specific life events one has experienced and how these events affected the individual.
9. Brief Symptom Inventory (BSI) -- asks for information about comfort level with selected problems and complaints.

### GENERAL NOTE:

Of the above 9 inventories, only the Mississippi PTSD Rating Scale and the Combat Exposure Scale are being used in this project to make a preliminary assessment of PTSD. The Physical Symptom Checklist, the Impact of Event Scale, and the Coping Strategies Inventory are also being scored for possible future use.

### PARTICIPANT RESPONSE NOTES:

1035 did not complete the Combat Exposure Scale or the last page of the Mississippi PTSD. His Traumatic Events Screen Inventory relates fears of injury or death for self and others and seeing dead bodies. However, his childhood/adolescence is positive for poverty, parental substance abuse and violence, parental death, personal physical, verbal and emotional abuse.

1070 reports no combat exposure but states was under SCUD missile attacks. His Traumatic Events Screen Inventory relates fears of injury or death for self and others as well as seeing dead bodies. He also has childhood/adolescence poverty with family violence so these responses could be related to early life experiences.

1080 experienced significant combat exposure but, based on these screening tools, appears to be handling the stress well.

1135 possibly has some PTSD symptoms not related to the Gulf War but to other factors from childhood/adolescence including: parental substance abuse, poverty, physical and emotional abuse.

1165 did not complete the demographic data, the Coping Strategies Inventory, Physical Symptom Checklist, the Impact of Event Scale, and one question on the Combat Exposure Scale.

1170 is very likely experiencing some form of post-traumatic stress. However, he also has a childhood/adolescence history positive for severe abuse.
<table>
<thead>
<tr>
<th>Subject</th>
<th>Laboratory Test Result</th>
<th>Male (PGW Veteran)</th>
<th>Female</th>
</tr>
</thead>
</table>
| 1 (-) PTSD | ANA  
Serum Mycoplasma IgG Ab  
Serum HSV-1 IgG Ab  
Serum CMV IgG Ab  
Cervical Urea. urealyticum | Positive (1:40)  
Positive | Positive 1:160 speckled  
Positive  
Positive  
Positive  
Positive |
| 2 poss. PTSD | ANA  
Serum Mycoplasma IgG Ab  
Serum HSV-1 IgG Ab  
Serum CMV IgG  
Cervical Urea. urealyticum  
Urine Group B strep. | Positive  
Positive  
Positive | Positive 1:80  
Positive  
Positive  
Positive  
Positive (10-50,000 cfu/ml) |
| 3 (-) PTSD | Serum Mycoplasma IgG Ab  
Serum CMV IgG Ab  
Cervical pap smear | Positive  
Positive | Positive  
Positive for Candida yeast |
| 4 (-) PTSD | WSR  
Bands on differential  
Serum HSV-1 IgG  
Cervical Urea. urealyticum | | 68 mm/hr (nl=0-20)  
14% (nl=0-6)  
Positive  
Positive |
| 5 poss. PTSD | Serum HSV-1 IgG Ab  
Serum HSV-2 IgG Ab  
Cervical culture  
Cervical pap smear | Positive | Positive  
Positive  
Moderate Strep Group B  
Many inflammatory cells |
| 6 (+) PTSD | Serum HSV-1 IgG Ab | Positive | Not available (wife did not participate in evaluation) |
V. Appendices:

I. Web Page
II. Questionnaires #1 and #2
III. Questionnaire #3 and PTSD packet
IV. Laboratory Evaluation tests
Appendix I

Burning Semen Syndrome

About This Web Site

My CV

Survey
QUESTIONNAIRE FOR GULF WAR "BURNING SEMEN SYNDROME"

1. Do you experience a burning sensation during or after ejaculation?
   Yes 21  No 20  Not Completed 1

2. Do you experience a burning sensation if you come in contact with your semen?
   Yes 15  No 26  Not Completed 1

3. Does your sexual partner experience a burning sensation of her skin or vagina when she comes in contact with your semen?
   Yes 41  No 1

4. Did this problem exist prior to serving in the Persian Gulf War?
   Yes 0  No 41  Not Completed 1

5. If no, did this problem begin immediately after returning from the Persian Gulf War after the first sexual encounter with your spouse or sexual partner?
   Yes 18  No 20  Not Completed 4

6. Does this burning sensation go away when you use a condom during sexual intercourse?
   Yes 20  No 9  Not Completed 13

7. If you experience this problem, have you sought medical attention?
   Yes 21  No 21

8. Have you been treated for any sexually transmitted diseases since returning from the Gulf War, such as gonorrhea, syphilis, cytomegalovirus, herpes virus, papilloma virus, hepatitis or human immunodeficiency virus?
   9 - Positive Responses to some type of STD.

9. If you and your sexual partner have experienced burning after contact with semen, would you be interested in participating in a study which investigates this problem further?
   Yes 39  No 3

10. If yes, please write your name, age, wife or sexual partner's name and age along with your address, day phone, work phone and FAX if you have one.
    Name ________________________________ Age ______
    Wife or partner's name ________________________ Age ______
    Address _______________________________
    Phone(day) ___________________ (work) ________ Fax ________

Thank you for answering this questionnaire. If you have answered yes to these questions, I will be contacting you in the near future with further details about participation in a study investigating burning semen syndrome.
QUESTIONNAIRE #2
Summary of Responses by Females
(N = 26)

NAME: ______________________________

ADDRESS: ______________________________

PHONE: ______________________________

QUESTIONNAIRE ABOUT POSSIBLE ALLERGY TO SEMEN

1. How long have you had the problem? A. _______ months.
   B. _______ year (Average)

2. Do you have the problem exclusively with your current sexual partner? A. 24 YES   B. 1 NO   Not Completed __ 1

3. If not, how many times have you experience a reaction with other sexual partners? 1 had symptoms with another partner

4. Did you have the reaction on your first intercourse? (After returning
   A. 12 YES   B. 12 NO   Not Completed 2 from Persian Gulf)

5. If the answer to the above is no, how many years after your first intercourse did the first reaction occur? 2 Reported months;
   9 reported 1-2 years; and 1 did not answer.

6. Prior to the first reaction did you have:
   A. _______ a recent pregnancy
   B. _______ recent gynecologic operation
   C. _______ other gynecologic problem

7. How soon after intercourse do your reactions occur?
   A. 22 Minutes B. 1 Hours C. 2 Days Not Completed 1

8. How long after intercourse do your reactions last?
   A. 5 Minutes B. 8 Hours C. 12 Days Not Completed 1

9. Do you have the following symptoms?
   Generalized itching
   A. 15 YES   11 NO
   Hives
   B. 7 YES   19 NO
   Chest tightness
   C. 11 YES   15 NO
   Shortness of breath
   D. 11 YES   15 NO
   Cough
   E. 10 YES   16 NO
   Wheezing
   F. 11 YES   15 NO
   Dizziness
   G. 12 YES   14 NO
   Faintness
   H. 8 YES   18 NO
   Complete collapse (shock)
   I. 2 YES   24 NO
   Unconsciousness
   J. 2 YES   24 NO

10. If your symptoms are localized only to the vaginal tissue and surrounding areas, do you have symptoms of:
    Deep pain
    A. 7 YES   19 NO
    Burning
    B. 20 YES   6 NO
    Redness
    C. 18 YES   8 NO
    Rash
    D. 11 YES   15 NO
    Blisters
    E. 4 YES   22 NO
11. Does the use of condoms prevent the reaction? 
A. _9 YES B. _9 NO Not Completed _8_

12. How old are you now? Average Age - 32 Years Old

13. How old were you when the reaction first began? 29.7 Yrs. Old

14. Do you have other types of allergies such as asthma, hayfever, hives or eczema? 
A. _9 YES B. _16 NO Not Completed _1_

15. Do you have allergy to foods? 
A. _4 YES B. _21 NO Not = _1 Completed_
If so, which one(s)? 2 - Pork; 1 - Egg/Milk; 1 - Didn't Specify

17. Do you have allergy to drugs? 
A. _13 YES B. _13 NO

18. If so, which one(s)? Pen (N=5); Emycin (N=1); Tetracycline (N=1); Sulfa (N=2); Analgesics (N=3); IVP Dye (N=1)

19. Does anyone in your family have a history of hayfever, asthma, eczema or hives? 
A. _5 YES B. _21 NO

20. Have you been treated for this condition before? 
A. _7 YES B. _19 NO

21. If so, what types of treatment have you had? Antihistamines (N=1); Colposcopy/Pap Smear (N=1); Antibiotics (N=1); Anti-fungal (N=2); Inhaler (N=1); Testosterone Injections (N=1).

22. Have you had any prior evaluation about the possible allergic aspects of your problem? 
A. _4 YES B. _21 NO

23. Have you had vaginitis due to Candida? 
A. _8 YES B. _16 NO Not Sure _2_

24. Do you wish to be evaluated by our medical group? 
A. _21 YES B. _2 NO Not Sure _2 Not Completed _1_

25. What is the name and address of the physician who has been treating you most recently for your problem?

NAME: _______________________________

ADDRESS: _______________________________

_____________________________________

PHONE: _______________________________
Appendix III

QUESTIONNAIRE FOR POSSIBLE ALLERGY TO SEMEN: FOR MALES

NAME: ____________________________________________

ADDRESS: _________________________________________

PHONE: (   )-____________________________________

WHEN AND WHERE IS THE BEST TIME TO CONTACT YOU DURING THE WEEK?

____________________________________________________

DATE OF BIRTH: ________  AGE: __________

1) WHEN WERE YOU STATIONED IN THE PERSIAN GULF? ____________

____________________________________________________

FOR HOW LONG? ____________

____________________________________________________

2) WHERE WERE YOU STATIONED WHILE IN THE PERSIAN GULF? ______

____________________________________________________

3) WHAT WERE YOUR RESPONSIBILITIES OR JOBS WHILE IN THE PERSIAN

GULF? ______________________________________________

____________________________________________________

4) WERE YOU EXPOSED TO CHEMICAL, DIESEL, PETROLEUM OR OTHER

FUMES WHILE IN THE PERSIAN GULF? _____ YES _____ NO  IF SO, WHICH

FUMES AND FOR HOW LONG WERE YOU EXPOSED? ________________

____________________________________________________

5) DID YOU CONTRACT LEISHMANIASIS WHILE IN THE PERSIAN GULF?

_____ YES _____ NO; IF YES, HOW WAS THIS TREATED AND FOR HOW LONG?

____________________________________________________
6) DID YOU HAVE CLOSE CONTACT WITH URANIUM WHILE IN THE PERSIAN GULF? _____ YES _____ NO; IF YES, WHEN AND FOR HOW LONG?

7) WERE YOU IN THE VACINITY OF SCUD MISSLE ATTACKS WHERE YOU MAY HAVE COME IN CONTACT WITH BIOLOGICAL OR CHEMICAL WARFARE AGENTS? _____ YES _____ NO; IF YES, WHEN AND WHERE WERE YOU EXPOSED?

8) WHILE IN THE PERSIAN GULF DID YOU EVER TAKE PYRIDOSTIGMINE BROMIDE IN ANTICIPATION YOU MIGHT BE EXPOSED TO CHEMICAL WARFARE AGENTS? _____ YES _____ NO; IF SO, HOW MANY TABLETS DID YOU TAKE OF THIS MEDICATION AND FOR HOW LONG?

9) DID YOU EXPERIENCE ANY SIDE EFFECTS FROM THIS MEDICATION? _____ YES _____ NO; IF SO, WHAT SIDE EFFECTS DID YOU EXPERIENCE AND HOW LONG DID THEY LAST?

10) WERE YOU DIRECTLY EXPOSED TO ANY PESTICIDES WHILE IN THE PERSIAN GULF?_____ YES _____ NO; IF YES, WHEN AND FOR HOW LONG WAS YOUR EXPOSURE?

11) WERE YOU VACCINATED TO ANTHRAX AND BOTULINUM TOXIN PRIOR TO GOING TO THE GULF WAR? _____ YES _____ NO; WHAT OTHER
VACCINATIONS, IF YES, DID YOU RECEIVE THEM PRIOR TO GOING TO THE GULF WAR? 

12) HAVE YOU EVER BEEN EVALUATED, DIAGNOSED OR TREATED FOR POST TRAUMATIC STRESS DISORDER (PTSD) SINCE RETURNING FROM THE PERSIAN GULF? YES NO; IF YES, ARE YOU CURRENTLY RECEIVING PSYCHOTHERAPY AND/OR MEDICATION FOR PTSD? YES NO; PLEASE LIST ALL MEDICATIONS YOU ARE TAKING FOR PTSD.

13) WHAT WAS YOUR GENERAL STATE OF HEALTH PRIOR TO GOING TO THE GULF WAR?

14) WERE YOU INVOLVED IN ANY DECONTAMINATION OPERATIONS AFTER THE WAR? YES NO; IF YES, PLEASE DESCRIBE YOUR INVOLVEMENT

15) DESCRIBE YOUR CURRENT STATE OF HEALTH SINCE RETURNING FROM THE PERSIAN GULF
16) HAVE YOU EVER BEEN DIAGNOSED AND/OR TREATED FOR ONE OR MORE OF THE FOLLOWING SEXUALLY TRANSMITTED DISEASES?

A) GONORRHEA
   ____ YES  ____ NO

B) SYPHYLIS
   ____ YES  ____ NO

C) HERPES SIMPLEX VIRUS I OR II
   ____ YES  ____ NO

D) CYTOMEGALOVIRUS (CMV)
   ____ YES  ____ NO

E) HUMAN IMMUNODEFICIENCY VIRUS (HIV)
   ____ YES  ____ NO

F) HUMAN PAPILLOMA VIRUS (HPV)
   ____ YES  ____ NO

G) HEPATITIS B OR C VIRUS
   ____ YES  ____ NO

17) WERE THESE SEXUALLY TRANSMITTED DISEASES DIAGNOSED BEFORE OR AFTER SERVING IN THE GULF WAR?  ____ BEFORE  ____ AFTER  ____ NOT APPLICABLE

18) DO YOU HAVE BURNING, REDNESS OR PAIN AFTER CONTACT WITH YOUR SEMEN?  ____ YES  ____ NO; IF SO, HOW LONG HAS THIS BEEN OCCURRING?

19) DOES YOUR SEXUAL PARTNER HAVE BURNING, REDNESS OR PAIN OF HER SKIN OR VAGINA AFTER CONTACT WITH YOUR SEMEN?  ____ YES  ____ NO; IF SO, HOW LONG HAS THIS BEEN OCCURRING?  ____ WKS  ____ MOS  ____ YRS

20) HAS THIS OCCURRED WITH OTHER SEXUAL PARTNERS?  ____ YES  ____ NO; IF YES, HOW MANY SEXUAL PARTNERS HAVE YOU EXPERIENCED THESE SYMPTOMS WITH?

21) DID YOU HAVE THIS REACTION PRIOR TO GOING TO THE PERSIAN GULF?  ____ YES  ____ NO
22) DID YOU HAVE THIS REACTION WITH YOUR FIRST INTERCOURSE AFTER RETURNING FROM THE PERSIAN GULF? YES NO; IF NO, HOW LONG AFTER RETURNING FROM THE PERSIAN GULF DID IT TAKE BEFORE YOU OR YOUR SEXUAL PARTNER STARTED TO EXPERIENCE THESE SYMPTOMS?

DAYS WKS MOS YRS

23) HOW SOON AFTER CONTACT WITH SEMEN DO THESE SYMPTOMS OCCUR?

(FOR FEMALE) MINS HRS DAYS

(FOR YOURSELF) MINS HRS DAYS

24) HOW LONG AFTER CONTACT WITH SEMEN DO THESE SYMPTOMS LAST?

(FOR FEMALE) MINS HRS DAYS

(FOR YOURSELF) MINS HRS DAYS

25) DO YOU HAVE ANY OF THE FOLLOWING SYMPTOMS AFTER CONTACT WITH YOUR SEMEN?

GENERALIZED ITCHING YES NO

HIVES YES NO

CHEST TIGHTNESS YES NO

SHORTNESS OF BREATH YES NO

COUGH YES NO

WHEEZING YES NO

DIZZINESS YES NO

FAINTNESS YES NO

COMPLETE COLLAPSE (SHOCK) YES NO
UNCONSCIOUSNESS ______ YES ______ NO

26) DOES USE OF A CONDOM PREVENT SYMPTOMS IN YOUR SEXUAL PARTNER? ______ YES ______ NO

27) HAVE YOU EVER HAD PROSTATITIS, A URINARY TRACT INFECTION OR OTHER URINARY TRACT DISORDER? ______ YES ______ NO

28) HAVE YOU HAD A VASECTOMY? ______ YES ______ NO; IF YES, WHAT YEAR?

__________________________________________________________________________

29) HAVE YOU EVER BEEN EVALUATED FOR AN INFERTILITY PROBLEM? ______ YES ______ NO; IF YES, PLEASE EXPLAIN__________________________________________________________________________

__________________________________________________________________________

30) DO YOU HAVE ANY PHYSICIAN DIAGNOSED HISTORY OF HAYFEVER, ASTHMA, HIVES AND/OR ECZEMA? ______ YES ______ NO; IF YES, PLEASE SPECIFY__________________________________________________________________________

__________________________________________________________________________

31) DO YOU HAVE ANY FOOD ALLERGIES? ______ YES ______ NO; IF YES, TO WHICH FOODS AND WHAT KIND OF REACTION(S) DO YOU EXPERIENCE?

__________________________________________________________________________

__________________________________________________________________________

32) DO YOU HAVE ANY DRUG ALLERGIES SUCH AS TO PENICILLIN OR SULFA DRUGS? ______ YES ______ NO; IF YES, PLEASE SPECIFY WHICH DRUGS, THE KIND OF REACTION(S) EXPERIENCED, AND HOW OLD YOU WERE AT THE TIME__________________________________________________________________________
33) DO YOU TAKE ANY PRESCRIPTION OR OVER THE COUNTER MEDICATIONS ON AN AS NEEDED OR REGULAR BASIS? _____YES _____NO; IF YES, PLEASE SPECIFY

34) DOES ANYONE IN YOUR FAMILY HAVE A HISTORY OF HAYFEVER, ASTHMA, HIVES AND/OR ECZEMA?

35) HAVE YOU PURSUED MEDICAL TREATMENT FOR THIS PROBLEM SINCE RETURNING FROM THE PERSIAN GULF? _____YES _____NO; IF YES, PLEASE EXPLAIN

36) ARE YOU CURRENTLY WITH THE SAME SEXUAL PARTNER YOU HAD PRIOR TO GOING TO THE PERSIAN GULF? _____YES _____NO; IF NO; PLEASE EXPLAIN

37) ARE YOU CURRENTLY HAVING REGULAR SEXUAL RELATIONS WITH YOUR SEXUAL PARTNER? _____YES _____NO

38) WOULD YOU BE WILLING TO PARTICIPATE IN A STUDY INVESTIGATING "BURNING SEMEN SYNDROME" WHICH WOULD REQUIRE A VISIT TO CINCINNATI, OHIO FOR A FEW DAYS IN THE NEXT SEVERAL MONTHS? (IF YOU ARE TRAVELING A FAR DISTANCE, FUNDS ARE AVAILABLE TO COVER
ALL TRAVEL EXPENSES) _____YES_____NO; IF NO, PLEASE EXPLAIN WHY

NOT_________________________________________________________

__________________________________________________________

PLEASE USE THE SPACE BELOW AND THE BACK OF THIS QUESTIONNAIRE TO
PROVIDE ANY ADDITIONAL INFORMATION THAT MAY BE RELEVANT TO
YOUR PROBLEM. THANK YOU FOR ANSWERING THIS QUESTIONNAIRE. WE
WILL BE CONTACTING YOU IN THE NEAR FUTURE FOR MORE
INFORMATION____________________________________________________

__________________________________________________________

__________________________________________________________

__________________________________________________________

__________________________________________________________

__________________________________________________________

__________________________________________________________

__________________________________________________________

__________________________________________________________
QUESTIONNAIRE FOR POSSIBLE ALLERGY TO SEMEN: FOR FEMALES

NAME:______________________________________________________________

ADDRESS:_________________________________________________________

PHONE: (   )-_______________________________________________________

DATE OF BIRTH:_________ AGE:_________

1) WERE YOU STATIONED IN THE PERSIAN GULF?___YES___NO; IF NO GO TO QUESTION 15; IF YES, FOR HOW LONG?_______________________________

2) IF YES, WHERE WERE YOU STATIONED WHILE IN THE PERSIAN GULF?___

3) WHAT WERE YOUR RESPONSIBILITIES OR JOBS WHILE IN THE PERSIAN GULF?______________________________________________________________

4) WERE YOU EXPOSED TO CHEMICAL, DIESEL, PETROLEUM OR OTHER FUMES WHILE IN THE PERSIAN GULF?A.____YES B.____NO IF SO, WHICH FUMES AND FOR HOW LONG WERE YOU EXPOSED?_______________________________

5) DID YOU CONTRACT LEISHMANIASIS WHILE IN THE PERSIAN GULF?____YES____NO; IF YES, HOW WAS THIS TREATED AND FOR HOW LONG?_______________________________

6) DID YOU HAVE CLOSE CONTACT WITH URANIUM WHILE IN THE PERSIAN GULF?____YES____NO; IF YES, PLEASE EXPLAIN?________________________________________
7) WERE YOU IN THE VACINITY OF SCUD MISSILE ATTACKS WHERE YOU MAY HAVE COME IN CONTACT WITH BIOLOGICAL OR CHEMICAL WARFARE AGENTS? ___ YES ___ NO; IF YES, PLEASE EXPLAIN? ____________________________

8) WHILE IN THE PERSIAN GULF DID YOU EVER TAKE PYRIDOSTIGMINE BROMIDE IN ANTICIPATION THAT YOU MIGHT BE EXPOSED TO CHEMICAL WARFARE AGENTS? ___ YES ___ NO; IF YES, HOW MANY TABLETS DID YOU TAKE OF THIS MEDICATION AND FOR HOW LONG? ____________________________

9) DID YOU EXPERIENCE ANY SIDE EFFECTS FROM THIS MEDICATION? ___ YES ___ NO; IF YES, WHAT SIDE EFFECTS DID YOU EXPERIENCE AND HOW LONG DID THEY LAST? ____________________________

10) WERE YOU DIRECTLY EXPOSED TO ANY PESTICIDES WHILE IN THE PERSIAN GULF? ___ YES ___ NO; IF YES, PLEASE EXPLAIN? ____________________________

11) WERE YOU VACCINATED TO ANTHRAX AND BOTULINUM TOXIN PRIOR TO GOING TO THE GULF WAR? ___ YES ___ NO; WHAT OTHER VACCINATIONS, IF ANY, DID YOU RECEIVE PRIOR TO GOING TO THE GULF WAR? ____________________________

12) HAVE YOU EVER BEEN EVALUATED, DIAGNOSED OR TREATED FOR POST TRAUMATIC STRESS DISORDER (PTSD) SINCE RETURNING FROM THE PERSIAN GULF? ___ YES ___ NO; IF YES, ARE YOU CURRENTLY RECEIVING
PSYCHOTHERAPY AND/OR MEDICATION FOR PTSD? ______ YES ______ NO.

IF YES, PLEASE LIST ANY MEDICATIONS YOU ARE TAKING FOR PTSD.


13) WERE YOU INVOLVED IN ANY DECONTAMINATION OPERATIONS AFTER
THE WAR? ______ YES ______ NO; IF YES, PLEASE DESCRIBE YOUR INVOLVEMENT.


14) WHAT WAS YOUR GENERAL STATE OF HEALTH PRIOR TO GOING TO THE
GULF WAR?


15) DESCRIBE YOUR CURRENT STATE OF HEALTH.


16) HAVE YOU EVER BEEN DIAGNOSED AND/OR TREATED FOR ONE OR MORE
OF THE FOLLOWING SEXUALLY TRANSMITTED DISEASES?

A) GONORRHEA ______ YES ______ NO

B) SYPHYLIS ______ YES ______ NO

C) HERPES SIMPLEX VIRUS I OR II ______ YES ______ NO
D) CYTOMEGALOVIRUS (CMV)  ____YES ____NO
E) HUMAN IMMUNODEFICIENCY VIRUS (HIV) ____YES ____NO
F) HUMAN PAPPILOMA VIRUS (HPV)  ____YES ____NO
G) HEPATITIS B OR C VIRUS  ____YES ____NO

17) WERE THESE SEXUALLY TRANSMITTED DISEASES DIAGNOSED BEFORE OR AFTER SERVING IN THE GULF WAR? ____BEFORE ____AFTER
____NOT APPLICABLE (GO TO QUESTION 18)

18) WERE THESE SEXUALLY TRANSMITTED DISEASES DIAGNOSED BEFORE OR AFTER YOUR SEXUAL PARTNER SERVED IN THE GULF WAR?
____BEFORE____AFTER

19) DO YOU HAVE BURNING, REDNESS OR PAIN AFTER CONTACT WITH YOUR SEXUAL PARTNER'S SEMEN? ____YES ____NO; IF YES, HOW LONG HAS THIS BEEN OCCURRING?

20) HAVE YOU EXPERIENCED BURNING, REDNESS OR PAIN OF YOUR SKIN OR VAGINA AFTER CONTACT WITH SEXUAL PARTNERS OTHER THAN YOUR CURRENT PARTNER? ____YES ____NO; IF YOU HAVE ORAL SEX, DO YOU GET BURNING OR OTHER SYMTPOMS IN YOU MOUTH, THROAT OR STOMACH? ____YES____NO____NOT APPLICABLE

21) HOW LONG HAVE THESE SYMTPOMS BEEN OCCURRING? ____WKS ____MOS ____YRS

22) HOW MANY OTHER SEXUAL PARTNERS HAVE YOU EXPERIENCED THESE SYMTPOMS WITH?

23) DID YOU HAVE THESE REACTIONS PRIOR TO GOING TO THE PERSIAN
GULF? ___ YES ___ NO ___ NOT APPLICABLE (GO TO QUESTION 24)

24) DID YOU HAVE THESE REACTIONS PRIOR TO YOUR SEXUAL PARTNER GOING TO THE PERSIAN GULF? ___ YES ___ NO

25) DID YOU HAVE THIS REACTION WITH YOUR FIRST INTERCOURSE AFTER RETURNING FROM THE PERSIAN GULF? ___ YES ___ NO ___ NOT APPLICABLE (GO TO QUESTION 26)

26) DID YOU HAVE THIS REACTION WITH FIRST INTERCOURSE AFTER YOUR SEXUAL PARTNER RETURNED FROM THE PERSIAN GULF? ___ YES ___ NO

27) HOW LONG AFTER RETURNING FROM THE PERSIAN GULF DID IT TAKE BEFORE YOU STARTED TO EXPERIENCE THESE SYMPTOMS? ___ DAYS ___ WKS ___ MOS ___ YRS ___ NOT APPLICABLE (GO TO QUESTION 28)

28) HOW LONG AFTER YOUR SEXUAL PARTNER RETURNED FROM THE PERSIAN GULF DID IT TAKE BEFORE YOU STARTED TO EXPERIENCE THESE SYMPTOMS? ___ DAYS ___ WKS ___ MOS ___ YRS

29) HOW SOON AFTER CONTACT WITH SEMEN DO THESE SYMPTOMS OCCUR? ___ MINS ___ HRS ___ DAYS

30) HOW LONG AFTER CONTACT WITH SEMEN DO THESE SYMPTOMS LAST? ___ MINS ___ HRS ___ DAYS

31) PRIOR TO YOUR FIRST REACTION, DID YOU HAVE A RECENT PREGNANCY, GYNECOLOGIC OPERATION OR OTHER PROCEDURE? ___ YES ___ NO; IF YES, PLEASE SPECIFY _______________________________________________________

32) WHICH OF THE FOLLOWING SYMPTOMS AFTER CONTACT WITH SEMEN
DO YOU EXPERIENCE?

GENERALIZED ITCHING  ____YES ____NO
HIVES  ____YES ____NO
CHEST TIGHTNESS  ____YES ____NO
SHORTNESS OF BREATH  ____YES ____NO
COUGH  ____YES ____NO
WHEEZING  ____YES ____NO
DIZZINESS  ____YES ____NO
FAINTNESS  ____YES ____NO
COMPLETE COLLAPSE(SHOCK)  ____YES ____NO
UNCONSCIOUSNESS  ____YES ____NO
BURNING  ____YES ____NO
VAGINAL ITCHING  ____YES ____NO
VAGINAL SWELLING  ____YES ____NO
BLISTERS  ____YES ____NO
DEEP PAIN  ____YES ____NO
RASH OTHER THAN HIVES  ____YES ____NO

OTHER REACTIONS (PLEASE DESCRIBE) ____________________________________________

33) DOES USE OF A CONDOM COMPLETELY PREVENT SYMPTOMS?
   ____YES ____NO

34) DO YOU HAVE ANY PHYSICIAN DIAGNOSED HISTORY OF HAYFEVER, ASTHMA, HIVES AND/OR ECZEMA? ____YES ____NO; IF YES, PLEASE
SPECIFY

35) DO YOU HAVE ANY FOOD ALLERGIES? ____YES ____NO; IF YES, WHICH FOODS AND WHAT KIND OF REACTION(S) DO YOU EXPERIENCE?

36) DO YOU HAVE ANY DRUG ALLERGIES SUCH AS TO PENICILLIN OR SULFA DRUGS? ____YES ____NO; IF YES, PLEASE SPECIFY WHICH DRUGS, THE KIND OF REACTION(S) EXPERIENCED AND HOW OLD YOU WERE AT THE TIME THE REACTION OCCURRED

37) DO YOU HAVE RECURRENT VAGINAL YEAST INFECTIONS? ____YES ____NO; IF YES, HOW FREQUENT ARE THEY?

38) DO YOU HAVE DIABETES? ____YES ____NO

39) HAVE YOU EVER TAKEN ORAL CONTRACEPTIVES? ____YES ____NO

40) ARE YOU CURRENTLY USING ORAL CONTRACEPTIVES? ____YES ____NO; IF YES; WHICH BRAND AND FOR HOW LONG?

41) DO YOU TAKE ANY PRESCRIPTION OR OVER THE COUNTER MEDICATIONS ON AN AS NEEDED OR REGULAR BASIS? ____YES ____NO; IF YES, PLEASE SPECIFY
42) DOES ANYONE IN YOUR FAMILY HAVE A HISTORY OF HAYFEVER, ASTHMA, HIVES AND/OR ECZEMA? ________________________________

43) ARE YOU CURRENTLY WITH THE SAME SEXUAL PARTNER THAT YOU WERE WITH FIVE YEARS AGO? ____ YES ____ NO; IF NO; PLEASE EXPLAIN ____________________________________________________________

44) ARE YOU CURRENTLY HAVING REGULAR SEXUAL RELATIONS WITH YOUR SEXUAL PARTNER? ____ YES ____ NO

45) HAVE YOU PURSUED MEDICAL TREATMENT FOR THIS PROBLEM? ____ YES ____ NO; IF YES, PLEASE EXPLAIN ____________________________________________________________

46) WOULD YOU BE WILLING TO PARTICIPATE IN A STUDY INVESTIGATING "BURNING SEMEN SYNDROME" WHICH MAY ENTAIL COMING TO CINCINNATI, OHIO FOR A FEW DAYS IN THE NEXT SEVERAL MONTHS? (IF YOU ARE TRAVELING A FAR DISTANCE, FUNDS ARE AVAILABLE TO COVER ALL TRAVEL EXPENSES.) ____ YES ____ NO; IF NO, EXPLAIN WHY ________________

__________________________________________________________

PLEASE USE THE SPACE BELOW OR THE BACK OF THIS QUESTIONNAIRE TO PROVIDE ANY INFORMATION THAT MAY BE RELEVANT TO YOUR PROBLEM. THANK YOU FOR ANSWERING THIS QUESTIONNAIRE. WE WILL BE IN
CONTACT WITH YOU IN THE NEAR FUTURE TO DISCUSS FURTHER
EVALUATION OF YOUR PROBLEM IF YOU ARE AGREEABLE.
Appendix III

COMBAT EXPOSURE SCALE

Please circle one answer for each item.

1. Did you ever go on combat patrols or have other very dangerous duty? (drive in convoys, in a combat zone, patrol rivers, helicopter assaults, perimeter guard duty, etc.)

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<td>1</td>
<td>NEVER</td>
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<td>2</td>
<td>&lt; 1 MONTH</td>
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<td>1-3 MONTHS</td>
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<td>4</td>
<td>4-12 TIMES</td>
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<tr>
<td>5</td>
<td>13-50 TIMES</td>
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<td>MORE THAN 50 TIMES</td>
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2. Were you ever under enemy fire?

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<td>4-6 MONTHS</td>
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<td>5</td>
<td>MORE THAN 6 MONTHS</td>
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3. Did you ever surround by the enemy?

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<td>3-12 TIMES</td>
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<tr>
<td>4</td>
<td>MORE THAN 12 TIMES</td>
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</table>

4. What percentage of the men in your unit were killed (KIA), wounded, or missing in action (MIA)?

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<tr>
<td>1</td>
<td>NO ONE</td>
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<td>2</td>
<td>1-25%</td>
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<td>3</td>
<td>26-50%</td>
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<td>4</td>
<td>MORE THAN 50%</td>
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5. How often did you fire rounds at the enemy?

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<td>3-12 TIMES</td>
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<td>4</td>
<td>13-50 TIMES</td>
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<tr>
<td>5</td>
<td>51 OR MORE</td>
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</table>

6. How often did you see someone hit be incoming or outgoing rounds? (at the moment it happened or very soon afterwards, enemy or American)

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<td>4</td>
<td>13-50 TIMES</td>
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<tr>
<td>5</td>
<td>51 OR MORE</td>
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7. How often were you in danger of being injured or killed? (i.e., pinned down, ambushed, near miss, an incident where you thought you were not going to make it, a really close call, etc.)

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<td>4</td>
<td>13-50 TIMES</td>
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<td>5</td>
<td>51 OR MORE</td>
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8. Were you involved in handling dead bodies?

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<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>NO</td>
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<td>2</td>
<td>1-2 TIMES</td>
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<tr>
<td>3</td>
<td>3-12 TIMES</td>
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<tr>
<td>4</td>
<td>MORE THAN 12 TIMES</td>
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</tbody>
</table>
Please answer the following questions about atrocities that you may have heard of, witnessed, or participated in during your military experience. Circle the answer that is most appropriate to your experience.

1. Torturing prisoners of war:  
   (a) no experience  
   (b) heard about it  
   (c) witnessed it  
   (d) participated in it

2. Torturing civilians:  
   (a) no experience  
   (b) heard about it  
   (c) witnessed it  
   (d) participated in it

3. Killing prisoners of war:  
   (a) no experience  
   (b) heard about it  
   (c) witnessed it  
   (d) participated in it

4. Killing civilians:  
   (a) no experience  
   (b) heard about it  
   (c) witnessed it  
   (d) participated in it

5. Mutilating corpses:  
   (a) no experience  
   (b) heard about it  
   (c) witnessed it  
   (d) participated in it

6. Killing children:  
   (a) no experience  
   (b) heard about it  
   (c) witnessed it  
   (d) participated in it
MISSISSIPPI PTSD RATING SCALE

Please circle the number that best describes how you feel about each statement.

1. In the past, I had more close friends than I have now.
   01 . . . . . 02 . . . . . 03 . . . . . 04 . . . . . 05
   NOT AT ALL  SLIGHTLY  SOMewhat  VERY  EXTREMELY
   TRUE       TRUE       TRUE       TRUE       TRUE

2. I do not feel guilt over things that I did in the past.
   01 . . . . . 02 . . . . . 03 . . . . . 04 . . . . . 05
   NEVER  RARELY  SOMETIMES  USUALLY  ALWAYS
   TRUE    TRUE    TRUE    TRUE    TRUE

3. If someone pushes me too far, I am likely to become violent.
   01 . . . . . 02 . . . . . 03 . . . . . 04 . . . . . 05
   VERY  UNLIKELY  SOMewhat  VERY  EXTREMELY
   UNLIKELY  UNLIKELY  LIKELY  LIKELY

4. If something happens that reminds me of the past, I become very distressed and upset.
   01 . . . . . 02 . . . . . 03 . . . . . 04 . . . . . 05
   NEVER  RARELY  SOMETIMES  FREQUENTLY  VERY
   TRUE    TRUE    TRUE    TRUE    TRUE

5. The people who know me best are afraid of me.
   01 . . . . . 02 . . . . . 03 . . . . . 04 . . . . . 05
   NEVER  RARELY  SOMETIMES  FREQUENTLY  VERY
   TRUE    TRUE    TRUE    TRUE    TRUE

6. I am able to get emotionally close to others.
   01 . . . . . 02 . . . . . 03 . . . . . 04 . . . . . 05
   NEVER  RARELY  SOMETIMES  FREQUENTLY  VERY
   TRUE    TRUE    TRUE    TRUE    TRUE

7. I have nightmares of experiences in my past that really happened.
   01 . . . . . 02 . . . . . 03 . . . . . 04 . . . . . 05
   NEVER  RARELY  SOMETIMES  FREQUENTLY  VERY
   TRUE    TRUE    TRUE    TRUE    TRUE

8. When I think of some of the things I have done in the past, I wish I were dead.
   01 . . . . . 02 . . . . . 03 . . . . . 04 . . . . . 05
   NEVER  RARELY  SOMETIMES  FREQUENTLY  VERY
   TRUE    TRUE    TRUE    TRUE    TRUE

40
9. It seems as if I have no feelings.

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<td>NOT AT ALL</td>
<td>RARELY</td>
<td>SOMETIMES</td>
<td>FREQUENTLY</td>
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<tr>
<td>TRUE</td>
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10. Lately, I have felt like killing myself.

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<tbody>
<tr>
<td>NOT AT ALL</td>
<td>SLIGHTLY</td>
<td>SOMEWHAT</td>
<td>VERY</td>
<td>EXTREMELY</td>
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<td>TRUE</td>
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11. I fall asleep, stay asleep and only awaken when the alarm goes off.

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<td>SOMETIMES</td>
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<td>TRUE</td>
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12. I wonder why I am still alive when others have died.

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<td>TRUE</td>
<td>TRUE</td>
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13. Being in certain situations make me feel as though I am back in the past.

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<td>TRUE</td>
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14. My dreams at night are so real that I waken in a cold sweat and force myself to stay awake.

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<td>SOMETIMES</td>
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<td>TRUE</td>
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15. I feel like I can not go on.

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<tr>
<td>NOT AT ALL</td>
<td>RARELY</td>
<td>SOMETIMES</td>
<td>VERY</td>
<td>ALMOST</td>
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<td>TRUE</td>
<td>TRUE</td>
<td>TRUE</td>
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16. I do not laugh or cry at the same things other people do.

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<td>SOMETIMES</td>
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<td>TRUE</td>
<td>TRUE</td>
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17. I still enjoy doing many things that I used to enjoy.

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<td>TRUE</td>
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18. Daydreams are very real and frightening.

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19. I have found it easy to keep a job.

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20. I have trouble concentrating on tasks.

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21. I have cried for no good reason.

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22. I enjoy the company of others.

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23. I am frightened by my urges.

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24. I fall asleep easily at night.

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25. Unexpected noises make me jump.

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26. No one understands how I feel, not even my family.

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<tr>
<td>NOT AT ALL</td>
<td>RARELY</td>
<td>SOMEWHAT</td>
<td>VERY</td>
<td>EXTREMELY</td>
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<td>TRUE</td>
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</table>
27. I am an easy-going, even-tempered person.

01 . . . . 02 . . . . 03 . . . . 04 . . . . 05
NEVER RARELY SOMETIMES USUALLY VERY MUCH SO

28. I feel there are certain things that I have done that I can never tell anyone, because no one would ever understand.

01 . . . . 02 . . . . 03 . . . . 04 . . . . 05
NOT AT ALL SLIGHTLY SOMEWHAT TRUE VERY TRUE
TRUE TRUE TRUE

29. There have been times when I used alcohol (or other drugs) to help me sleep or to make me forget about things that happened in the past.

01 . . . . 02 . . . . 03 . . . . 04 . . . . 05
NEVER INFREQUENTLY SOMETIMES FREQUENTLY VERY
FREQUENTLY

30. I feel comfortable when I am in a crowd.

01 . . . . 02 . . . . 03 . . . . 04 . . . . 05
NEVER RARELY SOMETIMES USUALLY ALWAYS

31. I lose my cool and explode over minor everyday things.

01 . . . . 02 . . . . 03 . . . . 04 . . . . 05
NEVER RARELY SOMETIMES FREQUENTLY VERY
FREQUENTLY

32. I am afraid to go to sleep at night.

01 . . . . 02 . . . . 03 . . . . 04 . . . . 05
NEVER RARELY SOMETIMES FREQUENTLY ALMOST
ALWAYS

33. I try to stay away from anything that will remind me of things which happened in my past.

01 . . . . 02 . . . . 03 . . . . 04 . . . . 05
NEVER RARELY SOMETIMES FREQUENTLY ALMOST
ALWAYS

34. My memory is as good as it ever was.

01 . . . . 02 . . . . 03 . . . . 04 . . . . 05
NOT AT ALL RARELY SOMETIMES USUALLY ALMOST
TRUE TRUE TRUE TRUE

43
35. I have a hard time expressing my feelings, even to the people I care about.

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<tbody>
<tr>
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<td>RARELY</td>
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<td>TRUE</td>
<td>TRUE</td>
<td>TRUE</td>
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36. At times I suddenly act or feel as though something that happened in the past were happening all over again.

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<td>TRUE</td>
<td>TRUE</td>
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37. I am unable to remember some important things that happened in the past.

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<td>TRUE</td>
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38. I feel "super alert" or "on guard" much of the time.

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39. If something happens that reminds me of the past, I get so anxious or panicky that my heart pounds hard; I have trouble getting my breath, I sweat, tremble or shake; or feel dizzy, tingly, or faint.

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<td>FREQUENTLY</td>
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Appendix IV

**Male** (Semen Cultures)

- Candida - Culture and KOH prep
- Gardinerella - KOH prep/wet mount
- Trichomonas - KOH prep/wet mount
- Chlamydia - viral transport medium
- Mycoplasma - mycoplasma medium
- Gonorrhea - chocolate agar plate
- HSV I and II - viral transport medium
- CMV - viral transport medium

**Female** (Vaginal/Cervical Cultures)

- Pap smear
- Candida - Culture and KOH prep
- Gardinerella - KOH prep/wet mount
- Trichomonas - KOH prep/wet mount
- Chlamydia - viral transport medium
- Mycoplasma - Mycoplasma medium
- Gonorrhea - chocolate agar plate
- HPV - DNA probe B211
- HSV I and II - viral transport medium
- CMV - viral transport medium

**Serologic Assessment** (both Male and Female)

- CBC with differential
- Renal, bone, liver panels
- ANA
- TSH
- C₃, C₄
- WSR
- Urinalysis
- Routine Urine Culture
- RPR
- HSV I & II
- CMV
- HIV

**Male only**

- PSA (prostate specific antigen)