DEPARTMENT OF THE NAVY
NAVAL MEDICAL COMMAND
WASHINGTON, D.C. 20372-5120

IN REPLY REFER TO
NAVMEDCOMINST 6230.2
MEDCOM-24
21 Apr 88

NAVMEDCOM INSTRUCTION 6230.2

From: Commander, Naval Medical Command
To: Ships and Stations Having Medical Personnel

Subj: MALARIA PREVENTION AND CONTROL

Ref: (a) NAVMED P-5120, Standards for Blood Banks and Transfusion Services, 12th Edition (NOTAL)
(b) BUMEDINST 6260.26
(c) NAVMEDCOMINST 6220.2

Encl: (1) Recommended Supplies for Malaria Prevention and Control Programs
(2) General Guidance for Malaria Prevention and Treatment
(3) Sources of Information and Consultation for Malaria Prevention and Control

1. Purpose. To provide general policy and recommendations for the prevention and control of malaria among Navy and Marine Corps personnel and their dependents, Military Sealift Command (MSC) personnel, and personnel of other services, including Federal civilian employees and their dependents serving, traveling, or attending activities aboard facilities under sponsorship of the Navy or Marine Corps. This instruction is a complete revision and should be read in its entirety. Symbols denoting deleted, revised, and added paragraphs are not reflected.

2. Cancellation. BUMEDINST 6230.11G.

3. Background

a. Historically, U.S. military campaigns fought in tropical environments have been seriously compromised by malaria. Today, malaria continues to pose a hazard to military personnel and their dependents deployed, living in, or traveling through malaria-risk areas. These areas include parts of Central and South America, Africa, the Middle East, and Asia. Resistance to standard chemoprophylaxis and treatment drugs has been demonstrated in malaria parasites in certain parts of the world. Similarly, some insecticide resistance has been demonstrated in the Anopheles mosquito vector.

b. Malaria is a particularly important disease hazard to Navy construction battalions, special warfare personnel, shore support activities, and Marine Corps units. Aviation personnel transiting

malaria transmission areas are also at risk, as are line and medical rapid deployment forces. Shipboard personnel are at risk when visiting ports where malaria transmission has been documented.

4. Action

a. Commanders, commanding officers, officers in charge, and masters of MSC ships whose commands or units are stationed in, or subject to operations in, malaria-risk areas must:

(1) Ensure their commands or units maintain adequate supplies of materials for malaria prevention and control. Enclosure (1) lists recommended items for these programs in general.

(2) Ensure all command personnel receive adequate instruction in individual malaria prevention.

(3) Ensure all other recommended malaria control measures are observed at all times, as a command priority item, by all persons under their authority whenever a malaria threat exists.

(4) Ensure a Disease Alert Report (DAR) (MED 6220-3) on any suspected or confirmed malaria case is sent out as soon as possible to all required addressees. Paragraph 5 provides further guidance.

b. Medical Department personnel, particularly medical officers, environmental health officers, entomologists, microbiologists, preventive medicine technicians, and independent duty corpsmen must advise and assist line and medical commanders in all aspects of malaria prevention and control required of the particular command or unit. These include: education and training; medical evaluation, chemoprophylaxis, and treatment protocols; geographical disease and vector risk assessment; personal protective measures; vector control; laboratory diagnostic capabilities; maintenance of appropriate supplies before, during, and after deployment or assignment to a malaria-risk area; and appropriate documentation in health records of malaria chemoprophylaxis, adverse drug effects, and related illnesses. Finally, Medical Department personnel must likewise advise, as appropriate, other health care beneficiaries who plan to travel through or be assigned to malaria-risk areas. Guidance on the principles of malaria chemoprophylaxis and treatment and sources of information and advice are provided in enclosures (2) and (3).

c. Blood donors are under the overall guidance of reference (a). Individuals who were treated for malaria in the past must wait 3 years from the date treatment was finished until they are eligible

to donate blood. Individuals who were in malaria-risk areas and were required to take chemoprophylaxis because of a perceived risk of exposure, must similarly wait 3 years from the time chemoprophylaxis was finished. Individuals who visited a malaria-risk area and remained asymptomatic, but were not required to take chemoprophylaxis because of negligible risk of exposure, must wait 6 months until they are eligible to donate blood. Finally, individuals who were placed on chemoprophylaxis initially because of intended travel into a malaria-risk area, but did not visit the area subsequently (and stopped chemoprophylaxis), have no required waiting period. These requirements apply to military blood banks as well as civilian blood collection agencies.

d. Personnel deficient in Erythrocyte Glucose-6-Phosphate Dehydrogenase (G-6-PD). All Navy, Marine Corps, and MSC personnel must have a documented G-6-PD test result in their health records, following reference (b). Any person who is G-6-PD deficient has a risk of hemolysis associated with taking primaquine for chemoprophylaxis or treatment. Accordingly, those persons who are traveling or deploying to a malaria-risk area must be identified and evaluated as to the need for special chemoprophylaxis and treatment protocols by Medical Department personnel. Other health care beneficiaries who will require malaria chemoprophylaxis and possible treatment must be offered screening for this deficiency.

5. Disease Alert Report. Report suspected or confirmed malaria cases in a DAR via priority message following reference (c). A malaria DAR should include the patient's itinerary during the previous 3 months and the types and duration of any chemoprophylaxis or treatment medications taken.

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5801 Tabor Ave.
Phila., PA 19120-5099

RECOMMENDED SUPPLIES FOR MALARIA PREVENTION AND CONTROL PROGRAMS

1. Recommended Items. The following is an extensive, but not all-inclusive list of items that can be used in a malaria prevention and control program. This list can be tailored for the requirements of the mission or operation of the particular type of fleet or shore unit. Items not in the Federal Supply System may have to be purchased when special circumstances of newly emerging resistance patterns of the malaria parasites to drugs or the mosquito vectors to insecticides are documented. The cognizant Navy environmental and preventive medicine unit (NAVENPVNTMEDU) or Navy disease vector ecology and control center (NAVDISVECTECOL CONCEN) must be contacted for advice on new items or items situationally required because of a unique deployment or geographical contingencies.

NSN	Item
Personal Protective Measures	
6840-00-753-4963	Insect repellent, clothing and personal, 75 percent DEET, 2 ounces
6840-01-067-6674	Insecticide, D-phenothrin, 2 percent
7210-00-266-9736	Insect bar (netting), cot type
7210-00-267-5641	Poles, insect bar (for suspending insect bar)
8415-01-035-0846	Parka, fabric mesh, insect repellent (DEET jacket) - small size
8415-01-035-0847	Parka, fabric mesh, insect repellent (DEET jacket) - medium size
8415-01-035-0849	Parka, fabric mesh, insect repellent (DEET jacket) - large size
8415-00-935-3130	Head net, insect
Laboratory Diagnosis	
6550-00-153-9968	Giemsa's staining solution, 50 ml

Wilson-Edeson (W/E) Test

Open purchase	Mercuric Chloride (USP), 1/4 pound
6505-00-136-7000	Potassium Iodide (USP)
6640-00-410-2820	Burner, alcohol, self-generating
6640-00-782-6012	Test tubes, 13 mm x 100 mm
6640-00-759-2152	Test tubes, plastic (snap cap)
6640-00-418-1000	Clamp, test tube
Open purchase	Hydrochloric Acid (concentrated)
6640-00-258-9210	Rack, test tube, laboratory (wire mesh, optional)
6630-00-299-8631	Pipette, dropping (plastic)

Antimalarial Drugs

6505-00-117-6450	Chloroquine phosphate tablets, 0.5 gm, 500's
6505-00-913-7905	Chloroquine/Primaquine phosphate tablets, individually sealed, 150's
6505-00-299-8273	Primaquine phosphate tablets, 1000's
6505-01-132-0257	Pyrimethamine-sulfadoxine (Fansidar ® tablets, 25's)
6505-00-957-9532	Quinine sulfate, 325 mg capsules, 100's
6505-01-095-4175	Doxycycline, 100 mg tablets, 50's
6505-01-078-3717	Chloroquine hydrochloride, injection
6505-00-864-6298	Quinidine gluconate, injection
6505-00-074-4582	Quinine dihydrochloride, injection**

**Parenteral quinine dihydrochloride is only available in limited supply through the Defense Personnel Support Center (DPSC), Philadelphia, PA. On an emergency basis, requesters must contact DPSC by the 24-hour telephone number: AUTOVON 444-2111; Commercial (215) 952-2111.

GENERAL GUIDANCE FOR MALARIA PREVENTION AND TREATMENT

1. Background. Sources listed in enclosure (3) provide necessary information on the biology and life cycle of the malaria parasite, entomology and control of the anopheline mosquito vectors, personal protective measures, clinical presentations and laboratory diagnosis of the various types of malaria, and antimalarial drugs for the prevention and treatment of malaria. In addition, NAVENPVNTMEDUs and NAVDISVECTECOLCONCENs provide comprehensive training courses for Medical Department personnel on these topics.

2. Vector Surveillance and Control Measures. These consist of effective Anopheles mosquito control programs. They involve the identification and elimination of breeding sites, surveillance of mosquito populations, and the proper application of insecticides. These measures must be instituted to the maximum extent possible under a given military situation. Technical support in these areas may be obtained from NAVDISVECTECOLCONCENs, from NAVENPVNTMEDUs, and from regional preventive medicine services.

3. Personal Protective Measures. On an individual basis, personal protective measures are the most important means (more so than chemoprophylaxis) for an individual to prevent becoming infected with malaria. These include minimizing outside activity and following basic clothing guidelines during the dusk-to-dawn hours of highest mosquito feeding; using prescribed individual chemical repellents on skin and clothing; wearing required protective clothing, particularly parkas and head nets; and using bed nets.

4. Chemoprophylaxis. Traditionally, malaria chemoprophylaxis has been effectively accomplished with the use of chloroquine and primaquine. However, in the past several years, resistance to chloroquine has been demonstrated among malaria parasites in certain areas of the world into which Navy and Marine Corps personnel deploy or live. Depending upon the operational schedule, current chemoprophylaxis regimens may require the use of other drugs, including pyrimethamine-sulfadoxine (Fansidar®) or doxycycline. Patterns of resistance and drug requirements can change frequently. Therefore, Medical Department representatives of fleet units deploying to malaria-risk areas must contact the NAVENPVNTMEDU (cognizant for the homeport area) prior to deployment for the latest malaria information and requirements in the intended area of operation.

5. Wilson-Edeson Test. The Wilson-Edeson Test is a screening test for the presence of chloroquine in the urine. It tests

overall unit compliance with taking chloroquine chemoprophylaxis. However, it has an approximately 15 percent false negative rate, i.e., member is taking chloroquine, but the drug is not detected in the urine. Therefore, a negative test cannot be used to "prove" an individual member has not been taking chloroquine. Documented malaria, in the presence of urinary chloroquine, strongly suggests a chloroquine-resistant strain. The cognizant area NAVENPVNTMEDU provides training in the technical and administrative aspects of using this test in the operational setting.

6. Treatment

a. Because malaria, in particular Plasmodium falciparum malaria, can progress into a rapidly fatal course, the most important aspect of malaria treatment is suspecting this disease in the differential diagnosis of the patient and beginning immediate treatment. The patient with a fever, other constitutional symptoms, and history of recent travel into a malaria-risk area must first be considered to have malaria unless proved otherwise.

b. All deploying Navy medical officers, physician's assistants, and independent duty hospital corpsmen must have sufficient knowledge and skills to make a clinical diagnosis of malaria and to begin basic antimalarial treatment immediately in symptomatic patients. Command or regional specialists in infectious disease, tropical medicine, or preventive medicine must be contacted for assistance in malaria cases where the treatment of the patient is difficult (e.g., severe illness, requirement for parenteral drugs) or the case is of particular epidemiological significance.

c. Independent duty corpsmen at sea or at shore in isolated settings who make a clinical diagnosis of malaria on a symptomatic patient must begin the initial treatment without delay. However, he or she must inform a medical officer as soon as possible about the diagnosis and treatment selected.

7. Parenteral Antimalarial Drugs. Parenteral chloroquine hydrochloride, quinidine gluconate, and quinine dihydrochloride can be used in the treatment of severe cases of malaria where the patient is exhibiting signs of central nervous system involvement, has a very high and life-threatening parasitemia, or cannot take oral drugs. Such patients are most commonly infected with Plasmodium falciparum, which may or may not be chloroquine-resistant, but sometimes they are infected with P. vivax. The underlying issues are:

a. Quinine-type drugs are rapidly schizonticidal (for all four Plasmodium species) and therefore rapidly reduce the level of parasitemia.

b. The ability of the patient to take oral medicines. These patients, and the use of these drugs, are best handled in an intensive care unit-like setting, whether at sea or on shore.

SOURCES OF INFORMATION AND CONSULTATION ON MALARIA PREVENTION AND CONTROL

1. Recommended Technical Publications

a. Navy Medical Department Guide to Malaria Prevention and Control. This is not an official Navy publication and thus does not have an instruction or publication number. It was written jointly by epidemiologists, environmental health officers, entomologists, and microbiologists and published by the Navy Environmental Health Center in 1984. A one page insert was published in 1987 and contains brief updates on chemoprophylaxis and treatment. The guide provides comprehensive guidance on all aspects of malaria prevention and control, including applicable laboratory tests. It is published in booklet form for ease of field use. Individual requests for more than ten copies should be addressed to the Commanding Officer, Navy Environmental Health Center, Bldg X-353, Naval Station, Norfolk, VA 23511-6695 (Attn: Code 61). NAVENPVNTMEDUs can provide lesser numbers of copies to requesters.

b. Control of Communicable Diseases in Man. A. S. Benenson, editor. Fourteenth edition, 1985. American Public Health Association. NAVMED P-5038. This paperback book provides an outstanding and comprehensive technical review of communicable diseases. Each disease is discussed in terms of: identification; description of infectious agent; occurrence; reservoir; mode of transmission; incubation period; period of communicability; susceptibility and resistance; and methods of control. Its small size makes it highly usable for field use. Order directly from: American Public Health Association, 1015 Fifteenth Street NW, Washington, DC 20005. (Approximate cost is $10.00)

c. Health Information for International Travel. This comprehensive guidance by the Centers for Disease Control (CDC), Atlanta, GA, is revised and published annually. Available from: Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Note: CDC recommendations do not take precedence over the contents of this instruction and recommendations of Navy medical authorities.

d. Medical departments of fleet units with an onboard medical officer, appropriate laboratory capabilities, or otherwise designated by force medical officers, should carry as a reference source, good quality color pictures of malaria parasites to aid in diagnosis. Two excellent sources are:

(1) Hunter's Tropical Medicine. G. T. Strickland, editor. Sixth edition, 1984. W. B. Saunders Co. This is a comprehensive hardcover textbook of clinical tropical medicine. (Approximate cost is $100.00)

(2) Bench Aids for the Diagnosis of Malaria. These consist of two sets of eight glossy plates total. Availability: World Health Organization Publications Centre USA, 49 Sheridan Avenue, Albany, NY 12210. (518) 436-9686. (Approximate cost is under $15.00.)

2. Navy environmental and preventive medicine units and Navy disease vector ecology and control centers, including area of responsibility (AOR) and message address

a. Officer in Charge
Navy Environmental and Preventive Medicine Unit No. 2
Naval Station
Norfolk, VA 23511-6288
Comm: (804) 444-7671; AV 564-7671
AOR: 100°W long E to 20°W long, including Iceland
NAVENPVNTMEDU TWO NORFOLK VA

b. Officer in Charge
Navy Environmental and Preventive Medicine Unit No. 5
Naval Station, Box 143
San Diego, CA 92136-5143
Comm: (619) 696-6130; AV 958-6130
AOR: 100°W long W to 150°W long, including Alaska
NAVENPVNTMEDU FIVE SAN DIEGO CA

c. Officer in Charge
Navy Environmental and Preventive Medicine Unit No. 6
Box 112
Pearl Harbor, HI 96860-5040
Comm: (808) 471-9505; AV 471-9505
AOR: 150°W long W to 70° E long, except Alaska
NAVENPVNTMEDU SIX PEARL HARBOR HI

d. Officer in Charge
U.S. Navy Environmental and Preventive Medicine Unit No. 7
Box 41
FPO New York 09521-4200 [Naples, Italy]
Comm (from within U.S.): 011-39-81-724-4468/-4469
Comm (from within Italy): 081-724-4468/-4469

Comm (from within other countries): Access overseas operator, request line for Naples, IT:724-4468/-4469

AV (worldwide): 18 - Ask operator for Naples 625-1110; then ask local operator for extension 4468/-4469

AOR: 70°E long W to 20°W long, except Iceland

USNAVENPVNTMEDU SEVEN NAPLES IT

e. Officer in Charge
Navy Disease Vector Ecology and Control Center
Naval Air Station, Building 130
Alameda, CA 94501-5039
Comm: (415) 869-3652; AV 686-3652
AOR: 100°W long W to 70°E long
NAVDISVECTECOLCONCEN ALAMEDA CA

f. Officer in Charge
Navy Disease Vector Ecology and Control Center
Naval Air Station, Box 43
Jacksonville, FL 32213-0043
Comm: (904) 772-2424; AV 942-2424
AOR: 100°W long E to 70°E long
NAVDISVECTECOLCONCEN JACKSONVILLE FL

3. Naval Medical Research Units. These commands are part of the Naval Medical Research and Development Command and are located at various areas around the world. All conduct tropical medicine research and can provide information on the epidemiology of malaria, antimalarial drug resistance, and mosquito vectors within their countries or geographic areas of research.

a. Commanding Officer
U.S. Naval Medical Research Unit No. 2
Manila, Republic of the Philippines
USNAVMEDRSCHU TWO MANILA RP

b. Commanding Officer
U.S. Naval Medical Research Unit No. 3
Cairo, Egypt
USNAVMEDRSCHU THREE CAIRO EGYPT

c. Officer in Charge
U.S. Naval Medical Research Unit No. 2 Detachment
Jakarta, Indonesia
USNAVMEDRSCHU TWO DET JAKARTA ID

d. Officer in Charge
Naval Medical Research Institute Detachment
Lima, Peru
USNAVMEDRSCHINSTITUTE DET LIMA PE

4. Naval Hospitals. Within the contiguous United States, including Alaska, the infectious disease divisions of the Naval Hospitals, Bethesda, MD, Portsmouth, VA, Oakland, CA, and San Diego, CA can provide information or direct patient consultation on malaria treatment. Naval hospitals outside the contiguous United States can be contacted by local shore or deployed units for similar advice.