

UNITED STATES OF AMERICA

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DEPARTMENT OF DEFENSE

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ARMED FORCES EPIDEMIOLOGICAL BOARD

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MEETING

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THURSDAY,

APRIL 16, 1998

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The meeting was held in the Randall Room of the Navy Environmental Health Center, 2510 Walmer Avenue, Norfolk, Virginia at 8:00 a.m., GERALD F. FLETCHER, M.D., President of the Board, presiding.

PRESENT:

Board Members:

GERALD F. FLETCHER, M.D., President  
JAMES R. ALLEN, M.D.  
HENRY A. ANDERSON, M.D.  
JOHN R. BAGBY, Ph.D.  
ELIZABETH BARRETT-CONNOR, M.D.  
JAMES CHIN, M.D.  
MARY LOU CLEMENTS-MANN, M.D.  
L. JULIAN HAYWOOD, M.D.  
JUDITH H. LaROSA, Ph.D.  
DENNIS M. PERROTTA, Ph.D.  
GREGORY A. POLAND, M.D.  
ARTHUR L. REINGOLD, M.D.  
CLADD E. STEVENS, M.D.

PRESENT (Continued):Preventive Medicine Officers:

LtCol. RUSSELL W. EGGERT  
LCDR. ANN P. FALLON, MC, USN  
LCol. FRANK SOUTER, CFMS  
LCDR. MARK TEDESCO

AFEB Staff:

MAJ. CAROL FISHER  
COL. VICKY FOGELMAN, Executive  
Secretary

Additional Attendees:

CDR. JOE P. BRYAN  
DR. CHARLOTTE GAYDOS  
DR. JOEL GAYDOS  
CAPT. KONRAD HYASHI  
DR. BARBARA KUTER  
CAPT. ANDREW LITTRELL  
CAPT. DAVID MACYS  
LCDR. MARGARET A. K. RYAN  
CAPT. RICHARD J. THOMAS

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1 P-R-O-C-E-E-D-I-N-G-S

2 (7:55 a.m.)

3 WELCOME/ADMINISTRATIVE ANNOUNCEMENTS

4 PRESIDENT FLETCHER: I'd like to thank  
5 everyone for coming today. We've been hosted  
6 well at the Norfolk Naval Air Station, our first  
7 trip. I think we've been the last -- we were  
8 talking last night -- to about seven or eight  
9 different on-site visits -- right, Dennis? --  
10 since we've been on.

11 MEMBER PERROTTA: Yes.

12 PRESIDENT FLETCHER: We've been to  
13 Fort Bragg, and we've been through many  
14 installations that enjoy being on-site and  
15 learning things and hopefully providing some  
16 information to our colleagues in the armed  
17 forces.

18 Interesting, today I was looking back  
19 at some Navy history since I used to be with the  
20 Marines and the Navy. Two hundred years ago the  
21 Navy was designated as a member as a part of the  
22 cabinet, as a separate department in what was  
23 then the Department of War. General Benjamin  
24 Stoddard was designated to head the cabinet of  
25 the Navy, Department of the Navy, in 1798.

26 So I guess this is the 200-year

1 anniversary of some sorts of the Navy. So it's  
2 been around a long time and, of course, John Paul  
3 Jones and Bonhomme Richard and all that many  
4 years before. The official Navy began 200 years  
5 ago.

6 So we want to, again, welcome all of  
7 you here. Colonel Fogelman, I'll turn it over to  
8 you now to give us some administrative  
9 guidelines.

10 EXECUTIVE DIRECTOR FOGELMAN: Thank  
11 you.

12 I'd like to welcome you, too, to the  
13 spring meeting of the AFEB. I'd also like to  
14 thank Captain Buck, the Commander of NEHC, the  
15 Naval Environmental Health Center; Commander  
16 Rendin; Pat Dibiaso; and the rest of the NEHC  
17 staff for helping to set up this meeting in  
18 support of this. It's been great to have, the  
19 kind of support we've had.

20 A couple of other announcements. The  
21 restrooms, in case you haven't found them, if you  
22 go out this door and take a left, they're just on  
23 your left-hand side.

24 There's also a phone in the break  
25 room. If someone needs to call in to leave a  
26 message, the number is (757) 363-5603 or 5500,

1 which is the front desk.

2 Yes?

3 PARTICIPANT: That phone doesn't allow  
4 you to call long distance unless something has  
5 been changed from yesterday.

6 PARTICIPANT: The one across the hall  
7 does not allow you to.

8 PARTICIPANT: Yes. So which one do we  
9 use?

10 PARTICIPANT: Down around the corner,  
11 first hallway on the right, second office on the  
12 right side.

13 PARTICIPANT: Okay.

14 EXECUTIVE DIRECTOR FOGELMAN: I'm sure  
15 they'll find you a phone somewhere.

16 Yes?

17 PARTICIPANT: Is there a DSN prefix  
18 for here?

19 EXECUTIVE DIRECTOR FOGELMAN: I'm sure  
20 there is. DSN I believe is what, 864? Is that  
21 right?

22 PARTICIPANT: Eight-six-four for  
23 calling in.

24 EXECUTIVE DIRECTOR FOGELMAN:  
25 Eight-six-four.

26 PARTICIPANT: Six for getting out.

1 EXECUTIVE DIRECTOR FOGELMAN: Right.  
2 If anyone has not paid for snacks, we're asking  
3 for two dollars per day contribution, if that's  
4 all right. Please pay at the break. You can pay  
5 Ms. Ward or Major Fisher.

6 I want to talk a little bit about  
7 lunch. You should each have been given two menu  
8 handouts: one for today and one for tomorrow.

9 For today, we're highly recommending  
10 that you don't step out for lunch because we're  
11 all going to have to take the bus to the ship.  
12 The bus will leave at 1:00 o'clock promptly. If  
13 you must step out, you need to be back before  
14 1:00 o'clock or the bus will leave without you.

15 We also ask that people bring some  
16 casual clothes to wear on the ship, at least so  
17 that you can climb on the ship, because there  
18 will be some ladder climbing. If you didn't and  
19 you need to go back to the Q, I'm sure there are  
20 enough people with cars that you could probably  
21 catch a ride with them. Now, the buses, I'll  
22 have Major Fisher talk a little bit more about  
23 the buses to the ship in a minute.

24 As far as lunch, on the menu for today  
25 and tomorrow, put your name at the top and then  
26 circle the item that you would like to have for

1 lunch. The cost will be what you see on the menu  
2 plus 20 percent to cover tax and tips. And you  
3 can pay on the break, but you need to pass in the  
4 menu before 9:00 o'clock so that they can make a  
5 call because we have so many people. And the  
6 food will be delivered here.

7 These folks didn't get menus.

8 PARTICIPANT: They look like this.

9 EXECUTIVE DIRECTOR FOGELMAN: We need  
10 to deliver the two days' worth of menus:  
11 Thursday and Friday. Make sure that you look and  
12 see which one is Thursday.

13 Now, for tomorrow, some of you may not  
14 want to eat. If you don't want to order anything  
15 for tomorrow, that's fine. Just don't pass your  
16 menu forward.

17 As far as dinner, I'm going to try and  
18 make arrangements at a restaurant in Norfolk  
19 tonight for at least Board members and  
20 consultants. It's called The Painted Lady. And  
21 the menu is a very nice menu. We had some  
22 copies.

23 MAJ. FISHER: People at the table have  
24 a copy of the menu.

25 EXECUTIVE DIRECTOR FOGELMAN: Right.

26 MAJ. FISHER: Here are a couple of

1 extra copies of the menu if anybody would like  
2 them.

3 EXECUTIVE DIRECTOR FOGELMAN: I'll be  
4 passing around a sheet, a sign-up sheet. If you  
5 wish to go to dinner, please sign up and indicate  
6 "Yes" or "No" whether you have a car. This  
7 restaurant does have a limousine that we can use  
8 if necessary, but if we have enough cars, we will  
9 go by car.

10 So please sign up. This goes for the  
11 audience, too. If you wish to participate, we'll  
12 try to get you in. I mean, if we have 100  
13 people, we may not be able to accommodate you,  
14 but we'll certainly try if you wish to come. So  
15 I'll go ahead and start that. We need that back  
16 probably by the end of the first break.

17 I'd like to let Major Fisher for just  
18 a few seconds talk about the tour this afternoon  
19 and the ship.

20 MAJ. FISHER: There are going to be  
21 two buses here this afternoon at 1:00 o'clock to  
22 take us to the ship. The buses will not remain  
23 with us. They will drop us off. No private  
24 vehicles are allowed on the pier. So you have to  
25 take one of the two buses.

26 The buses will come back and pick us

1 up and get us back to the -- well, one bus will  
2 go back to the BOQ for those who want to go  
3 directly back to the BOQ. The other bus will  
4 come back here to NEHC.

5 For anyone who changes clothes or  
6 anyone who has a briefcase or other material that  
7 they don't have a car to put it in, you will have  
8 access in the NEHC van. And you can put your  
9 personal things in that van. The van will  
10 deliver those. The van should be at the BOQ when  
11 the buses get back to the BOQ after the tour.

12 Okay? Any questions about that?

13 MEMBER BARRETT-CONNOR: Can we leave  
14 papers here?

15 MAJ. FISHER: Yes, you can leave  
16 papers here.

17 PARTICIPANT: Our personal belongings  
18 are brought back only to the BOQ or are also  
19 here? I'm going to the airport.

20 EXECUTIVE DIRECTOR FOGELMAN: Well, I  
21 would just leave your personal belongings here,  
22 then.

23 PARTICIPANT: Oak.

24 MAJ. FISHER: Yes, right. One bus is  
25 coming back here. One bus is going to the BOQ.

26 Any other questions?

1 PARTICIPANT: What time is it coming  
2 back?

3 MAJ. FISHER: The tour is over -- we  
4 should be back by 4:30.

5 EXECUTIVE DIRECTOR FOGELMAN: I  
6 wouldn't say. I'd say maybe 4:45.

7 MAJ. FISHER: Forty-five?

8 EXECUTIVE DIRECTOR FOGELMAN: I'd say  
9 between 4:30 and 5:00 o'clock. It just depends  
10 on when we finish and everybody gets on the bus  
11 and gets back here.

12 Okay. Anything else about the tour  
13 this afternoon?

14 MAJ. FISHER: Anybody else have a  
15 Thursday menu for lunch?

16 EXECUTIVE DIRECTOR FOGELMAN: Just  
17 remember the tour will involve some climbing of  
18 ladders. If you don't feel that you can climb  
19 some ladders on the ship, it might be wise just  
20 to say that you aren't going to go on the tour.  
21 I don't think it's going to be that strenuous,  
22 but just to let you know you should have low-heel  
23 shoes and hopefully slacks for the ladies.

24 Tomorrow we were lucky enough to have  
25 Rear Admiral Rowley, who is the new Command  
26 Surgeon of the U.S. Atlantic Command, come in and

1 talk to us about the future of military health  
2 care. And I think that will be a very  
3 interesting briefing for everyone.

4 I know there have been a lot of  
5 questions about: Where is the military going  
6 with regard to health care? He's very much a  
7 futurist from what I hear and has been the leader  
8 of the Military Health Service 2020 group, which  
9 has really been the strategy group looking to  
10 where the military is going to go. So I think  
11 you'll enjoy that briefing first thing in the  
12 morning tomorrow.

13 Also, for those that were in the  
14 meeting yesterday, I just wanted to mention Mr.  
15 Kurt Lineham from Bioject is here. Would you  
16 stand up, please?

17 MR. LINEHAM: Right here.

18 EXECUTIVE DIRECTOR FOGELMAN: You're  
19 here? Yes. If anybody has any questions about  
20 Bioject, which was one of the injectors that  
21 wasn't briefed that you had an information  
22 package in your packet. If you have any  
23 questions for him about that particular injector,  
24 he'll be happy to answer them for you.

25 It's also been noted that some people  
26 have been smoking out in front of the building.

1 There is a designated smoking area here, but  
2 apparently it's not in front of the building. I  
3 think it's outside the loading dock.

4 Major Fisher, do you have more  
5 information on that?

6 MAJ. FISHER: They said it's a covered  
7 area out at the loading dock. It's back this  
8 way.

9 EXECUTIVE DIRECTOR FOGELMAN: The  
10 issue here is if you must smoke, please ask  
11 someone who is assigned here to NEHC and find out  
12 where the designated smoking area is, please.

13 Commander Rendin, just raise your  
14 hand. And if you need to smoke, then just check  
15 with him. He'll show you where to go.

16 (Laughter.)

17 EXECUTIVE DIRECTOR FOGELMAN: Okay.  
18 Did you have anything else, sir, before we press  
19 on? Okay. I'd like to go ahead and start our  
20 fairly aggressive schedule this morning if that's  
21 all right.

22 Our first briefer will be Captain  
23 David Macys, who is the Executive Officer of the  
24 Naval Environmental Health Center. He will be  
25 giving us a command briefing.

26 Captain Macys?

1                   CAPT.   MACYS:        Thank  you,  Colonel  
2  Fogelman.

3                   EXECUTIVE  DIRECTOR  FOGELMAN:    Thank  
4  you.

5   COMMAND BRIEF

6                   CAPT.    MACYS:        Dr.    Fletcher,  
7  distinguished  members  of  the  Board,  distinguished  
8  consultants  and  visitors,  welcome  to  the  Hampton  
9  Roads  area  and  welcome  to  the  Navy  Environmental  
10 Health  Center.  On  behalf  of  Admiral  Reason,  who  
11 is  the  Commander  in  Chief  of  the  U.S.  Atlantic  
12 fleet,  and  Captain  Buck,  who  is  the  Commanding  
13 Officer  of  the  Navy  Environmental  Health  Center,  
14 I'm  very  pleased  to  be  able  to  welcome  you  to  
15 Hampton  Roads  and  to  the  Navy  Environmental  
16 Health  Center.

17                   The  Navy's  presence  in  Hampton  Roads  
18 goes  back  to  the  beginnings  of  the  Republic.  And  
19 we  have  a  fairly  large  presence  in  Hampton  Roads.

20       I'll  take  a  few  minutes  to  lay  out  some  
21 background  information  to  give  you  a  sense  of  the  
22 Navy's  presence  here  in  the  Tidewater  area  as  
23 well  as  to  give  you  an  overview  of  the  Navy  
24 Environmental  Health  Center  and  the  scope  of  our  
25 mission.

26                   The  Navy  in  Hampton  Roads  encompasses

1 more than a dozen bases from the Naval Base  
2 itself, the Naval Air Station at Norfolk, the  
3 Amphibious Base at Little Creek, the Armed Forces  
4 Staff College, the Naval Medical Center in  
5 Portsmouth, and the Naval Medical Center various  
6 branch clinics throughout the area. Nearly 130  
7 ships, 30 aircraft squadrons, and 200 shore  
8 activities are located in this area.

9           The Navy's presence dates back to the  
10 1700s. And it has had a continuous presence here  
11 since 1799 with the construction of warships in  
12 nearby Gosport on the Elizabeth River, which is  
13 now the site of the Norfolk Naval Shipyard.

14           The first ship built there was the USS  
15 Chesapeake in 1799. Chesapeake was one of the  
16 frigates that fought the War of 1812. The  
17 Monitor-Merrimac Battle was fought right off the  
18 shoreline here on our doorstep March 9th, 1862.

19           The Naval Base itself dates back to  
20 the Jamestown Exposition, which was held in this  
21 area to commemorate the 300th anniversary of the  
22 English settlement in Jamestown. It was a  
23 prototype world fair.

24           Many buildings were constructed by the  
25 various states to illustrate their history and  
26 some of their distinctive architecture. This

1 exposition was constructed in 1906 for an opening  
2 in 1907.

3 The great white fleet of 16  
4 battleships, some of them which fought the  
5 Spanish-American War, initiated their  
6 around-the-world voyage from here, returning in  
7 1909.

8 Naval aviation was born here. Eugene  
9 Ely made a five-minute flight from the USS  
10 Birmingham, and it landed on that spit of land,  
11 Willoughby Spit, that the bridge tunnel  
12 connecting to Hampton now departs from.

13 In 1917, President Woodrow Wilson  
14 signed a bill allowing the Navy to purchase the  
15 Jamestown Exposition land and buildings and build  
16 the home for the East Coast fleet. There were 21  
17 such structures. And they formed the nucleus of  
18 Admiral's Row.

19 You may get a chance as you drive over  
20 to the base today depending on the route that the  
21 bus drivers take to see some of these structures.

22 In fact, maintaining those structures was part  
23 of the deed conditions when the Navy bought the  
24 land.

25 One of the buildings, the Philadelphia  
26 House, is actually a one-third replica of

1 Independence Hall. Until recently, in fact, that  
2 building housed the Hampton Roads Naval Museum,  
3 which is now located on the second floor of  
4 Nauticus, the National Maritime Center, pictured  
5 here on the slide.

6 This is one of the premier attractions  
7 located in downtown Norfolk on the waterfront.  
8 Nauticus is part science center, part interactive  
9 museum, and part aquarium.

10 There is a proposal that the  
11 battleship Wisconsin be docked alongside the  
12 museum. This is pictured here in the slide,  
13 although we haven't moved the Wisconsin yet.  
14 They're still looking for the five million  
15 dollars it would take to move it from the  
16 shipyard across the river to this site just a  
17 couple of miles away.

18 The Naval Museum has an extensive  
19 collection of naval prints, ship models, and  
20 underwater archaeology. The focus is on the  
21 history of the Navy in Hampton Roads as seen  
22 through the eyes of American sailors.

23 Although there is an admission fee for  
24 Nauticus, the Hampton Roads Naval Museum is free.

25 I can recommend them both. And we will be able  
26 to get information on those if you are interested

1 in seeing them.

2 Norfolk is the headquarters for the  
3 Department of Defense's East Coast commands.  
4 Admiral Howard W. Gehman is Commander in Chief,  
5 U.S. Atlantic Command. He also serves as  
6 Commander of NATO's Supreme Allied Command,  
7 Atlantic, or SACLANT. He is the senior military  
8 authority for all NATO land, sea, and air forces  
9 in the Atlantic theater of operations.

10 The SACLANT staff consists of  
11 personnel from 13 of the NATO's 16 member  
12 countries. And Spain and France maintain  
13 military missions on the compound.

14 Admiral John Paul Reason is the  
15 Commander in Chief of the U.S. Atlantic fleet,  
16 one of the three major commanders in chief for  
17 the U.S. Navy. Additional commands headquartered  
18 here in Norfolk under him are the type commands  
19 for the naval surface forces in the Atlantic  
20 fleet; the naval air forces, Atlantic fleet; the  
21 submarine force, Atlantic fleet; and the fleet  
22 marine force, Atlantic; commander, second fleet;  
23 leads one of the country's five numbered fleets  
24 and the major antisubmarine warfare strike force  
25 in the Atlantic.

26 The type commands, for those of you

1 who are not familiar with Navy organizations, are  
2 the commands which are responsible for training  
3 and maintaining the various elements of the  
4 fleet. They're the ones who make sure that the  
5 fleet units before they deploy are ready for  
6 deployment, ready to execute the mission.

7           The type commanders turn those fleet  
8 elements over to the numbered fleet commanders,  
9 who are then responsible for the execution of the  
10 mission and deploying these forces and operating,  
11 either directly or under the command and control  
12 of a commander joint task force.

13           The Naval Base Norfolk, the Navy's  
14 capital and the world's largest naval  
15 installation, is one of the largest bases here in  
16 Norfolk, as you might imagine.

17           It's also the landlord for the other  
18 bases in this area. It has a large number of  
19 tenant activities on the base itself and is in  
20 the process of becoming the landlord for all of  
21 the other bases in this area under a concept of  
22 regionalization that's in the process of being  
23 developed right now.

24           The largest of the tenants is the  
25 fleet, of course, which is made up of aircraft  
26 carriers, submarines, cruisers, destroyers, a

1 large variety of ships, which you'll get to see  
2 in the course of driving out to the piers this  
3 afternoon.

4           When the 98 ships home-ported here at  
5 the Naval Base are not at sea, they are alongside  
6 one of the 15 piers. And we'll do sort of the  
7 windshield tour of that just to give you a sense  
8 of the variety of ships that are necessary to  
9 project power from the sea.

10           Here we see an S860B Sea Hawk  
11 helicopter in the upper right-hand corner leading  
12 the guided missile frigate USS Samuel B. Roberts  
13 and the Los Angeles class of pack submarines, USS  
14 Baltimore, as they return after a six-month  
15 deployment to the Mediterranean.

16           You can't tell looking at this  
17 picture, but the Samuel B. Roberts once upon a  
18 time over in the Gulf hit a mine, broke in half.  
19       Literally the ship broke in half.

20           The training that the type commanders  
21 conduct was responsible for that crew being able  
22 to fight the fires, do the damage control, and  
23 literally lash that ship back together using  
24 wire, rope, shackles, eye bolts. And they kept  
25 that ship afloat when, by all rights, that ship  
26 should have sunk. They got her to a dry dock,

1 and repairs were made. And she is now back with  
2 the fleet.

3 I bring that out because of the  
4 emphasis on training that we have. We train as  
5 we fight. The captain of that ship and every  
6 single crew member -- I happen to know the supply  
7 officer on board at the time. Every single one  
8 of them credited the training that they had that  
9 they conducted before they deployed, the training  
10 that they conducted during their transit with  
11 saving that ship.

12 And that's what, really, the Navy in  
13 Norfolk is all about. We train the forces and  
14 then turn them over to the fleet commanders and  
15 the joint task force commanders. When we do,  
16 they are ready.

17 To give you a sense of the scale of  
18 the Navy's presence here, this line shows the  
19 acreage for the Naval Base and the numbers of  
20 major buildings.

21 With over 1,200 buildings, we can  
22 handle quite a large presence. Obviously with  
23 downsizing, those numbers are ratcheting down,  
24 but the projected loading about 12-15 years from  
25 now is still for 15 to 18 squadrons and 90 to 100  
26 ships, which is roughly a third of what the

1 projected fleet size in that time frame is.

2 To do a walking tour or the windshield  
3 tour, if you will, briefly to give you a sense of  
4 what you will be seeing this afternoon, if you  
5 were to drive along the waterfront, the first  
6 thing that you will see would be the oilers.  
7 These are used to transfer fuel, munitions,  
8 supplies, and personnel from one vessel to  
9 another underway.

10 It is probably appropriate that  
11 they're the first stop on this tour because  
12 that's not a glamorous job and much of what we're  
13 doing is being turned over to the civilian  
14 mariners of the Military Sealift Command. But  
15 without the ability to do underway replenishment,  
16 we would not be able to maintain presence forward  
17 for months on end on a continuous basis.

18 Underway replenishment is something  
19 that the United States Navy does better than  
20 anybody and always has done better than anybody.

21 And it is the key component that keeps those  
22 ships out there in the Mediterranean, in the  
23 Indian Ocean, in the Persian Gulf without having  
24 to go back to port on a very regular basis.

25 The next thing you would see in the  
26 tour would be the submarines. There are two

1 classes of attack submarines currently in the  
2 inventory, the Sturgeon class and the Los Angeles  
3 class.

4 With the commissioning of the  
5 nuclear-powered submarine USS Nautilus in 1954,  
6 all subsequent submarines have been  
7 nuclear-powered. And this slide shows the USS  
8 Minneapolis/St. Paul undergoing repair work in  
9 the auxiliary floating dry dock Resolute, which  
10 is also at the Norfolk Naval Base.

11 Cruisers, destroyers, frigates, these  
12 are the multi-mission forces of the fleet. There  
13 are many different types. Each of them perform  
14 and mix some missions, but together they are able  
15 to provide anti-air warfare, anti-submarine  
16 warfare, anti-surface ship warfare, and strike  
17 warfare. These ships carry the latest guided  
18 missiles, torpedoes, electronic and safety  
19 devices.

20 Amphibious ships are the ones that  
21 deliver the Marines, the other half of the  
22 Navy-Marine Corps team, their equipment and  
23 supplies wherever they need to be to support the  
24 national security mission.

25 The last two piers along the  
26 waterfront are used primarily for docking the

1 large aircraft carriers. Carriers home-ported in  
2 Norfolk right now include: the Enterprise, the  
3 Eisenhower, the Theodore Roosevelt, the George  
4 Washington, and the John C. Stennis.

5 Stennis is currently over in the  
6 Persian Gulf. And on completion of her  
7 deployment, she won't be returning here. She is  
8 headed the rest of the way around the world  
9 because she will be home-ported on the West Coast  
10 after this deployment.

11 Here we see the guided missile cruiser  
12 USS Normandy steaming alongside the aircraft  
13 carrier USS George Washington. This photograph  
14 was taken out in the Arabian Sea during the  
15 George Washington's last deployment. The naval  
16 --

17 EXECUTIVE DIRECTOR FOGELMAN: Sir,  
18 could you give us a feeling for, for example, how  
19 many crew are on the guided missile frigate  
20 versus the aircraft carriers?

21 CAPT. MACYS: Sure. I'll head back to  
22 that now. The carrier with an air wing on board  
23 during a deployment will typically run about  
24 5,500-5,600 people. That's the crew of the ship.  
25 That's the pilots of the aircraft, the  
26 maintenance personnel for that aircraft,

1 everything it takes to run a small city for six  
2 months or more.

3 The cruiser will typically have about  
4 300-350 sailors on board. A frigate will run in  
5 the 200 to 250 range. And the ones you can't  
6 see, the submarines, they're in the 100-120 crew  
7 member range.

8 These are, remember, operating around  
9 the clock and capable of operating around the  
10 clock for six months at a crack. So what you  
11 would see on a typical visit won't be all the  
12 crew at any one time. Some of them are down in  
13 the racks trying to get some shuteye before they  
14 have to take over.

15 Colonel?

16 PARTICIPANT: Approximately how many  
17 medical personnel would be on the aircraft  
18 carriers?

19 CAPT. MACYS: Probably -- what do you  
20 think, Konrad, about 50 or so in the medical  
21 department?

22 CAPT. HYASHI: About 15. And the  
23 great bulk is the corpsmen, some independent duty  
24 corpsmen, on the aircraft carriers, some  
25 independent medicine technicians. We have a  
26 senior medical officer, flight surgeon, and

1 others that come with the wing, anesthesiologists  
2 or nurse anesthetists, and administrative types.

3 So you've got a fair mix, but it is  
4 not a medical center at sea. It's designed  
5 around the mission primarily of trauma response  
6 and preventive medicine.

7 CAPT. MACYS: To introduce Captain  
8 Hyashi, he is the command surgeon for the surface  
9 forces, U.S. Atlantic fleet, speaks with  
10 authority on it, inside out.

11 The Naval Air Station at Norfolk is  
12 located adjacent to the Naval Base as one of the  
13 world's busiest military airports. An aircraft  
14 takes off or lands every six minutes around the  
15 clock. More than 300 flights a day are logged in  
16 or out of the Air Mobility Command terminal there  
17 at NAS.

18 NAS Norfolk is home to 120 aircraft,  
19 which provide vital anti-submarine, passenger,  
20 and logistical support. They also perform  
21 airborne early warning, air traffic control, and  
22 any mine work there for the naval ships deployed  
23 to the Atlantic, Indian Ocean, and Mediterranean  
24 theaters.

25 One of the aircraft that flies out of  
26 NAS Norfolk is the E-2C Hawkeye, the Navy's

1 carrier base tactical airborne warning and  
2 control system platform. The Hawkeye carries  
3 three primary sensors: radar, as you see in the  
4 dome above the aircraft there; IFF, or  
5 Identification: Friend or Foe; and a passive  
6 detection system. The aircraft is packed. Its  
7 volume is approximately 70 percent electronics.

8 Twenty-four hours a day seven days a  
9 week the Navy operates at least two of these  
10 aircraft off of the East Coast to provide  
11 aircraft or ship detection.

12 The slide shows a Hawkeye preparing to  
13 launch from Catapult Number 3 of the USS George  
14 Washington. And hopefully they won't launch it  
15 until our Yellow Jacket gets out of the way.

16 Next slide. This is a C-2 Greyhound,  
17 or COD, aircraft. COD is Carrier On-board  
18 Delivery. The primary mission of the Greyhound  
19 is to support the ships that are underway at sea.

20 This is how your mail gets to the ships during  
21 deployment.

22 It's powered by two turboprop engines.

23 It's designed to be the largest aircraft to  
24 operate off the aircraft carriers. With the  
25 Hawkeye and the Greyhound, you see most of the  
26 remaining turboprop aircraft in the Navy's fleet.

1                   Here we see a crewman giving the  
2 Greyhound a last look before launching aboard the  
3 George Washington during a joint task force  
4 exercise conducted off the coast of North  
5 Carolina.

6                   As we saw in the first slide with the  
7 Samuel B. Roberts, we deployed SH-3 Sea King  
8 helicopter squadrons as well. This is the  
9 multipurpose helicopter the Navy uses for search  
10 and rescue missions, any submarine warfare,  
11 transport of personnel and supplies between the  
12 ships and to the ships.

13                   The glamorous part of naval air is  
14 shown here, but it's not at Naval Air Station  
15 Norfolk. It's at Naval Air Station Oceana  
16 located in Virginia Beach, about 25 miles or so  
17 southwest of the naval station.

18                   Oceana is currently home to 13 attack  
19 fighter squadrons and the entire complement of  
20 F-14 Tomcats the Navy maintains stateside. The  
21 Navy plans on relocating an additional 10 to 12  
22 FA-18 squadrons -- that's up to 180 aircraft --  
23 from Florida to NAS Oceana as a result of the  
24 base relocation and closure conditions actions.

25                   To put that in some kind of economics  
26 perspective, if they locate all of the squadrons

1 up here, all 180 aircraft, the projections are an  
2 additional \$225 million will be pumped into the  
3 economy in the Hampton Roads area each year.

4 We see several Hornets here along with  
5 an EA-6B Prowler electronic warfare aircraft in  
6 the skies over the Arabian Gulf refueling from an  
7 Air Force KC-10 Extender tanker.

8 On the coast near Oceana is the Fleet  
9 Combat Training Center Atlantic at Dam Neck. The  
10 training center provides our fleet with training  
11 in a multitude of warfare areas, and it provides  
12 that training in very easy commuting distance  
13 from the piers. This is extremely valuable when  
14 you need to do refresher training, new skills  
15 training but you don't have the money to send  
16 your crew to a TAD site at some distance away.  
17 So Dam Neck provides a very valuable service  
18 being located right in the fleet home port.

19 Dam Neck is also a good illustration  
20 of the Navy's commitment to conservation of  
21 natural resources. It's 1,300 acres of wetlands,  
22 marshes, coastal beaches, and sand dunes.

23 We have a very active environmental  
24 preservation and recycling program. Dam Neck is  
25 one of the commands that has won awards in this  
26 area at the DOD level in the recent past.

1           The amphibious base is located on  
2 Chesapeake Bay just west of the Chesapeake Bay  
3 Bridge Tunnel and is home port for more than 30  
4 ships. Its piers provide docking facilities for  
5 most of the amphibious force ships of the  
6 Atlantic fleet, the ships that carry the Marines  
7 where they need to be and get them there when  
8 they need to be. And it also serves as home port  
9 for several ships of other forces afloat,  
10 including the Coast Guard.

11           Pictured here is one of the landing  
12 craft air cushion vehicles, which are home-ported  
13 there at Little Creek. This is the vehicle that  
14 transports the Marines and their equipment from  
15 the ships to the demarcation points ashore,  
16 whether it's on the beach or several miles  
17 inland.

18           Additional training. We have the  
19 Armed Forces Staff College located not far from  
20 the Naval Base. This is part of the National  
21 Defense University, which recently celebrated its  
22 50th birthday and prepares selected mid-career  
23 officers for joint and combined staff duty.

24           Next slide. Not to focus solely on  
25 the Navy, but Hampton Roads is also home to major  
26 installations of both the Air Force and the Army.

1 Coast Guard has a very large presence in the  
2 Hampton Roads area as well. More and more the  
3 Services are operating in a joint and combined  
4 fashion. And more and more we strengthen our  
5 ties to our sister services and to the forces  
6 stationed with us.

7 The military community is, as you  
8 might imagine, a very large presence here. This  
9 gives a sense of the impact that the Navy and  
10 Marine Corps has on the Hampton Roads area.

11 There are over 300,000 in the total  
12 Navy-Marine Corps family in this area, and they  
13 interact with the community in a great many  
14 different ways. One of the ways is, in fact --  
15 this is the 16th. Not this coming weekend but  
16 the following weekend will be the Azalea Festival  
17 here in Norfolk.

18 The Navy is a big presence at the  
19 Azalea Festival. Blue Angels will be here this  
20 year, for instance. And each year a NATO nation  
21 is recognized as the honored nation for the  
22 festival. This year we're honoring Denmark. And  
23 Queen Helena Winther of Copenhagen will reign  
24 over the festival as the International Azalea  
25 Festival queen.

26 We also have a strong Personal

1 Excellence Partnership program with the schools  
2 in the area. Sailors assist teachers and  
3 children in academic and recreational activities.

4 The all-important economic toting up  
5 the balance, we have quite an impact here. The  
6 annual payroll was nearly five billion dollars  
7 last year. And if you combine that with the  
8 purchase of goods and services, the total impact  
9 in '97 was over six billion dollars.

10 Navy medicine's presence in Hampton  
11 Roads goes back a long ways. The Naval Medical  
12 Center is the oldest and the second largest naval  
13 hospital in the United States. In fact, Building  
14 1 is on the historical register and is preserved  
15 and still in use today, although it's as an  
16 administrative facility, not as an actual medical  
17 care facility.

18 The cornerstone of the original  
19 hospital was laid in 1827, and the first patients  
20 were admitted in 1830. Today, there is a  
21 360-bed, 15-story hospital that was built in  
22 1960, which houses the majority of the medical  
23 center's medical capability.

24 We're in the process of constructing a  
25 new \$330 million acute care facility. And, as I  
26 mentioned earlier, there are several branch

1 clinics located throughout the area, placing  
2 medicine where it needs to be at the deck plates  
3 for the sailor.

4 The Naval Dental Clinic is  
5 headquartered here as well and located just  
6 outside the naval station. And it has branch  
7 clinics also throughout Hampton Roads.

8 Tri-Care, the military's managed  
9 health care program, first began as a  
10 demonstration project here in October of '92.

11 Tri-Care is designed around the specific needs of  
12 the military community in Hampton Roads for both  
13 active-duty and retired military members and  
14 their families.

15 And, lastly, Hampton Roads is also the  
16 home of the Navy's worldwide preventive medicine  
17 programs here at the Naval Environmental Health  
18 Center. Our mission is to ensure readiness. We  
19 do that through leading in the prevention of  
20 disease and in the promotion of health.

21 I suspect that Admiral Rowley may  
22 speak in more detail to this. This is a slide  
23 borrowed from a Department of Defense briefing on  
24 force health protection. This is the new model  
25 for a very old way of doing business.

26 The occupation of soldier, sailor,

1 airmen, or marine is, as you might have gathered  
2 from the descriptions of deployments and the size  
3 of crews aboard ships, it's a full-time job,  
4 "full-time" meaning around the clock, 24 hours a  
5 day, 7 days a week.

6           And what this model describes is a  
7 life cycle management of the health of the  
8 service member. We don't want to focus on a  
9 single piece of it anymore. We want to look at  
10 the totality of the military life cycle,  
11 deployments as well as in-garrison situations.

12           And in the end, what we want to do is  
13 produce what's now known as a medically hardened  
14 soldier or sailor, one who is at the optimum  
15 level of health, fit and ready to deploy and  
16 conduct in the mission.

17           Our challenge within that in  
18 preventive medicine is to keep the forces, both  
19 deployed forces and the deployable forces here  
20 stateside, ready so that when the 911 call comes,  
21 it's come as you are. If you're not ready,  
22 you're not going to answer that call. So our job  
23 is to make sure that they are ready and that they  
24 are able to maintain that state of readiness.

25           Military preventive medicine has  
26 existed for a very long time. Its most recent

1 formal codification or description was done by  
2 the Department of Defense. Assistant Secretary  
3 of Defense for Health Affairs Office issued DOD  
4 Directive 6490.2 and the implementing  
5 instruction, 6490.3, speaking to joint medical  
6 surveillance with a focus on, but not exclusively  
7 on deployment medical surveillance. The idea is  
8 to protect health throughout military service.

9 The specific focus on deployments is  
10 to ensure that we identify the hazards in  
11 advance, if at all possible, but certainly there  
12 on the ground, provide that information, its  
13 implications to the joint task force commander to  
14 factor into his or her operational risk  
15 management decisions.

16 We are also archiving the samples that  
17 we take to ensure that we have sufficient  
18 information with the intent that we do two  
19 things. We want no more Agent Oranges, no more  
20 toxicological surprises, if you will. And we  
21 want no more Gulf War illnesses. We don't want  
22 any surprises on what the forces were or were not  
23 exposed to.

24 Next slide. Preventive medicine is  
25 defined in the instruction in a very broad sense.

26 It's not just the classical infectious diseases

1 and vectors, but it is everything which  
2 contributes to the wellness and health of the  
3 service member. And it will include communicable  
4 diseases, illnesses, and injuries due to exposure  
5 to occupational and environmental threats, and  
6 any other threat to the health and readiness of  
7 military personnel and military units.

8 In order to do that, next slide, it  
9 encompasses many specialties, again, not just  
10 classical epidemiology and clinical preventive  
11 medicine and medical entomology, but also the  
12 occupational and environmental fields, the health  
13 promotion and wellness fields, and the laboratory  
14 support and R&D capabilities necessary to ensure  
15 that our practice stays at the state-of-the-art,  
16 it anticipates what's coming, and that we're  
17 ready to meet those anticipated threats when they  
18 become real.

19 We view ourselves as the type command  
20 for population-based medicine. The Commander in  
21 Chief of the Atlantic fleet has several type  
22 commands for his different forces: submarine  
23 forces, air forces, surface forces. We consider  
24 ourselves to be not just the Atlantic fleet's but  
25 the Navy's type command for population-based  
26 medicine.

1                   Population-based medicine is another  
2 way to say the application of epidemiological and  
3 public health principles to the maintenance or  
4 the achievement and maintenance of readiness  
5 across the spectrum throughout the service  
6 member's career.

7                   Next slide. We embody that in the  
8 catch phrase or the motto of "Think populations.  
9 See individuals." You will probably see that  
10 slide repeated a number of times over the course  
11 of the next couple of days from NEHC presenters  
12 in any event.

13                   We here at the Navy Environmental  
14 Health Center work in several functional areas.  
15 And essentially what you see here mirrors what  
16 was defined in the DOD's instruction describing  
17 military preventive medicine.

18                   We have instituted, for instance, a  
19 new program in medical management or clinical  
20 epidemiology to take that concept of prevention  
21 and the "Think Populations, See Individuals"  
22 approach to the medical treatment facilities.

23                   In managed care, ideally what you  
24 would do would be to reduce your patient load and  
25 increase your customer load. The beneficiary  
26 population should be coming to us for advice and

1 assistance in maintaining their health much more  
2 than they should be coming to us to be cured of  
3 something.

4 We also provide support to programs  
5 such as the drug testing program, which is  
6 another aspect of achieving and maintaining  
7 readiness. We support the Navy Inspector General  
8 in the oversight and compliance with some of the  
9 programs, the programs in occupational safety and  
10 health and environmental.

11 We operate with our Echelon 4  
12 activities as an integrated team. The field  
13 activities are scattered around the world and  
14 are, in fact, the larger component of this  
15 organization.

16 There are approximately 200 or so  
17 people here in Norfolk at the Navy Environmental  
18 Health Center. The total command worldwide is  
19 about 640 personnel.

20 The field activities are the operating  
21 arm. The command here provides the oversight and  
22 management, coordination across the several  
23 activities in the field. And we provide backup  
24 for both advanced expertise and for personnel,  
25 too, if somebody somewhere needs some extra  
26 support for a limited period of time.

1           Together we provide a worldwide  
2 service to ensure that the fleet in the FMF are  
3 ready.       The operating arms of the Navy  
4 Environmental Health Center include the  
5 broad-scope preventive medicine provided by the  
6 environmental and preventive medicine units and  
7 entomological-focused scope in the two disease  
8 vector ecology control centers.

9           We provide the radiation dosimetry for  
10 the entire Navy, both for the Nuclear Power  
11 Program and for whatever other radiation  
12 dosimetry needs to be performed. And we operate  
13 the three drug screening laboratories.

14           The scope is worldwide. The EPMUS  
15 split the world into four quarters. The DBECCs  
16 cut it in half. The scope of operations is quite  
17 broad. They don't focus on the home ports. They  
18 focus on where the fleet and FMF elements are,  
19 wherever they are, around the world.

20           The directorates here are organized  
21 along disciplinary lines. We find that that is  
22 the most convenient to ensure professional  
23 development and enhancement.

24           Epidemiologists working with  
25 epidemiologists tend to reinforce and support  
26 each other, but what we find in the actual

1     conduct of business is that we work in a  
2     cross-directorate, collaborative fashion, both  
3     within the building and with our subordinate  
4     activities.

5             This really is the default approach to  
6     the way we conduct business to develop these  
7     cross-disciplinary teams because the nature of  
8     the issues that we deal with demand that. It's  
9     not enough anymore to have simply an infectious  
10    disease expert or perspective on these problems.

11            As I said, you'll see this a lot.  
12    It's the catch phrase that we use to remind  
13    ourselves that as we look at an individual with a  
14    problem, we see that individual not only as  
15    someone who needs assistance but as symptomatic  
16    of, perhaps, a larger context. And what we  
17    really want to do is get at that context, look  
18    for root causes and root them out.

19            Welcome to Norfolk. Welcome to NEHC.  
20    Thank you for coming. And I can answer any  
21    questions if you'd like.

22            (Applause.)

23            PRESIDENT FLETCHER: Dr. Macys, thanks  
24    for your very enlightening and futuristic  
25    comments. I think by our time scale, we should  
26    go into the next comment. Thank you.

1 EXECUTIVE DIRECTOR FOGELMAN: Our next  
2 two briefings are really a follow-up to an issue  
3 discussed in the past on the interchangeability  
4 of hepatitis A vaccines.

5 Our first briefer will be Commander  
6 Joe Bryan, who is the Chief of the Department of  
7 Tropical Medicine at the Naval School of Health  
8 Sciences in Washington. He is going to be  
9 talking about some preliminary results of a study  
10 which we're doing amongst some military folks.

11 Commander Bryan?

12 CDR. BRYAN: Well, thank you, Colonel  
13 Fogelman.

14 COMPARISON OF HEPATITIS A VACCINES (FOLLOW UP)

15 CDR. BRYAN: It's an honor and a  
16 privilege to be here today to talk about a  
17 hepatitis A vaccine study that we have been  
18 conducting. This is a study that is in progress.

19 The results are preliminary. I'm really not  
20 ready to release our results very much because we  
21 are still in a preliminary stage. Last Saturday  
22 night I was looking at some of the data in making  
23 these slides. So all of this is very new.

24 The study is called, "A Randomized  
25 Comparison of the Two Licensed Hepatitis A  
26 Vaccines."

1                   Next slide, please.       We're very  
2 interested in hepatitis A in the military and  
3 also in the civilian world because hepatitis A is  
4 the most common cause of hepatitis in the United  
5 States now. And so it has been a common cause of  
6 hepatitis A in the military, though it has been  
7 very difficult to find cases recently with the  
8 use of the gamma globulin that we have used since  
9 1945 and, more recently, with the introduction of  
10 hepatitis A vaccines. However, hepatitis A does  
11 remain a problem for travelers and for those  
12 deployed to areas where sanitation is less than  
13 adequate.

14                   Next slide, please. Now, as I said,  
15 there are two hepatitis A vaccines that are now  
16 licensed. The first to be licensed is called  
17 Havrix, developed by SmithKline Beecham. It was  
18 approved in 1995. It's a vaccine that was made  
19 from the HM175 strain of hepatitis A. I believe  
20 it originally came from Australia. It's an  
21 inactivated vaccine.

22                   The efficacy trial, as you know, was  
23 done in Thailand using some 40,000 Thai children.  
24 This was done as part of the cooperative  
25 research development agreement between U.S. Army  
26 and SmithKline. That was a trial that showed

1 efficacy in terms of preventing hepatitis A in  
2 Thailand.

3           The second vaccine was developed by  
4 Merck Research Labs and was licensed in 1996, I  
5 think about April of 1996. This is a vaccine  
6 that was developed from a Costa Rican strain of  
7 the virus, CR326, which was attenuated and used  
8 as a vaccine in the attenuated form and then  
9 later inactivated. So the product that we have  
10 now is first attenuated and then inactivated.

11           The efficacy trial for that vaccine  
12 was conducted in Monroe, New York among Hasidic  
13 Jewish children and only involved about 1,000  
14 children because of the high attack rate.

15           Both of these vaccines are inactivated  
16 host cell vaccines. Both vaccines were really  
17 developed by the companies. There was, as I  
18 said, a cooperative research development  
19 agreement with both companies for various aspects  
20 of development. But in terms of being able to  
21 compare the vaccines to see which one might have  
22 a better performance, it has been difficult for  
23 them anyway to interpret some of the data.

24           For example, with the Merck vaccine,  
25 it is licensed for adults at 50 units, which I  
26 understand is about 50 micrograms of protein.

1 The SmithKline vaccine is licensed at 1,440 ELISA  
2 units. It's difficult for me to interpret what  
3 that means.

4 Both companies measured antibody  
5 responses with different assays. SmithKline had  
6 an in-house assay, ELISA assay. And Merck then  
7 developed a modification of Abbott's RIA  
8 measurement for anti-HAV antibody against  
9 hepatitis A virus.

10 So there have been no comparisons of  
11 the two vaccines. Furthermore, there's been  
12 little data on the interchangeability of the  
13 vaccines. If you get your first dose with one  
14 vaccine, is it's okay to get your second dose  
15 with the other vaccine?

16 And, finally, we have little data on  
17 the duration of antibody. I meant to say at  
18 first by way of disclosure that I have been the  
19 principal investigator on three vaccine trials  
20 with the Merck Company.

21 These protocols were with Merck. The  
22 funding was through the Henry M. Jackson  
23 Foundation, a private foundation that works with  
24 Uniformed Services University. However, the  
25 study I am going to tell you about today is a  
26 Uniformed Services University protocol with

1 funding from the university.

2 Next slide, please. To determine  
3 something about the immunogenicity of these  
4 vaccines, the antibody response has been studied.

5 There are various ways of measuring antibody.

6 Original Abbott RIA test, it takes  
7 only about 150 mIUs per ml of anti-HAV, far above  
8 what we would expect after giving gammaglobulin,  
9 for example, 5 cc's of gammaglobulin. We would  
10 expect more like 20 mIUs.

11 So this was very insensitive. It's  
12 fine for detecting cases of hepatitis A, but in  
13 terms of vaccine studies, it's totally  
14 inadequate. So Merck Research Labs did a  
15 modification, basically for the IgG, our total  
16 antibody, basically rearranged the ratios. And,  
17 as I understand, it put about ten times more sera  
18 into the reaction as is licensed by Abbott. With  
19 that modification, they can detect about ten mIUs  
20 per ml's, as I understand.

21 The Abbott IMX is a micro particle  
22 method of detecting antibody marketed by Abbott.

23 It detects about 20 out of 20. I was looking at  
24 the data again last night. They really say 25  
25 mIUs per ml.

26 An in-house ELISA by SmithKline

1 detects about 20 mIUs per ml. And there is a new  
2 assay developed by Behringer-Mannheim in Germany  
3 that has been off the slide here. This is said  
4 to detect certainly ten mIUs per ml. And some  
5 people say ten to one mIU per ml; so something a  
6 little more sensitive, it appears.

7           Next slide. We had three major  
8 objectives in our study here: to determine the  
9 relative immunogenicity and reactogenicity of the  
10 two vaccines, including the proportion with  
11 antibody at two and four weeks after  
12 immunization.

13           That is, you give vaccine. How many  
14 people are going to have antibody two weeks later  
15 when we deploy or when a traveler goes out?  
16 Second, to determine the interchangeability of  
17 the vaccine; and, third, to determine the  
18 duration of antibody against hepatitis A. We  
19 need to give booster doses of hepatitis A  
20 vaccine.

21           Next slide, please. Our methods,  
22 then, human methods. I conducted this study  
23 mainly at Uniformed Services University among our  
24 military medical students.

25           We have about 160 medical students in  
26 each class in Uniformed Services University.

1 I've conducted a number of vaccine trials there.

2 The first thing I always do is propose this to  
3 the dean of the medical school to see if this is  
4 something he would support.

5 I use a criteria of using vaccines  
6 that are required for the military. For example,  
7 some of the studies had involved hepatitis B  
8 vaccine. Number two, I want to make sure that  
9 there is a very high likelihood that the students  
10 will get a benefit from this vaccine. And,  
11 third, is it going to take away from academic  
12 time? If it does, then we don't do it.

13 So the dean did approve this. The  
14 Human Use Review Committees at Uniformed Services  
15 University of the Health Sciences approved this  
16 study. And then we extended it to a couple of  
17 different sites. And so the National Naval  
18 Medical Center Human Use Review Committee also  
19 reviewed and approved this study.

20 We had to develop a memorandum of  
21 agreement with the U.S. Naval Academy. Plus, we  
22 have done several vaccine studies at Uniformed  
23 Services University. There just aren't very many  
24 people who haven't been immunized as part of our  
25 studies or as part of getting the vaccine because  
26 it's required of all military people to be

1 immunized with hepatitis A vaccine by the end of  
2 this year.

3           So we went to the Naval Academy. By  
4 the time we get the memorandum of agreement,  
5 imagine working through our legal system. Two  
6 things had happened. The students were out for  
7 the summer. And then when we came back in the  
8 fall, the Naval Academy is so efficient that they  
9 had immunized basically all 5,000 of the  
10 midshipmen here. So you'll be pleased to know  
11 that all of those people have been immunized. We  
12 did get some volunteers, though, from the clinic  
13 at Annapolis.

14           Next slide, please. So most of our  
15 volunteers came from USUHS medical, nursing, and  
16 graduate students, staff and faculty; additional  
17 volunteers from the naval clinic in Annapolis;  
18 and, then, third, from the Reserve unit at the  
19 National Naval Medical Center.

20           The Human Use Review Committee with  
21 regard to the students, one of the stipulations  
22 was that the investigators be blinded as to which  
23 students were participating to prevent either the  
24 students thinking that they would get some kind  
25 of benefit just staying in the study or any kind  
26 of coercion from a senior officer. So it made it

1 much more difficult for me to conduct the study,  
2 rather than doing these studies myself, drawing  
3 blood and so on. I had to basically train and  
4 use four different nurses.

5 Now, next slide, please. Volunteers  
6 received an informational briefing about  
7 hepatitis A vaccines and other vaccines that we  
8 give our military people. And in terms of  
9 requirements, they have a written informed  
10 consent.

11 Those who want to participate -- and  
12 about a third of our medical students did want to  
13 participate in this study. We screened for  
14 anti-HAV using the IMX antibody test by Abbott.  
15 And those that were found negative were  
16 randomized to one of four different groups.

17 Next slide, please. In these groups  
18 --

19 EXECUTIVE DIRECTOR FOGELMAN: What  
20 percentage were negative?

21 CDR. BRYAN: I'll show you that data  
22 in just a minute.

23 The groups then were as follows. The  
24 first group received Vaqta at zero and six  
25 months; the second group, Vaqta at zero and then  
26 Havrix at six months; and then, just the mirror

1 image, Havrix at zero and six months and Havrix  
2 at zero and Vaqta at six months. So it was a  
3 crossover.

4 Next slide, please. We evaluated the  
5 symptoms, the reactogenicity of the vaccines,  
6 with a written questionnaire concerning symptoms  
7 at 4, 24, 48 hours after each dose. We collected  
8 blood samples, 5 ml's at 2, 4, 24 weeks, 28 weeks  
9 after dose one and expect to have additional  
10 blood collections at 12, 24, and 36 months.

11 Next slide, please. Statistically, we  
12 calculated the number of volunteers to be able to  
13 detect a moderate difference in proportion with  
14 the seroconversion of at least ten mIUs per ml at  
15 2 and 4 weeks and then also to detect a moderate  
16 difference between the two vaccines in terms of  
17 geometric means at 4, 26, and 28 weeks.

18 For the first dose, then, we had 100  
19 patients immunized with each vaccine. The second  
20 dose, then, because of the grouping, there will  
21 be 50 patients in each group.

22 Next slide, please. A laboratory --

23 MEMBER HAYWOOD: You really mean  
24 persons, not patients; right?

25 CDR. BRYAN: I'm sorry, sir?

26 MEMBER HAYWOOD: These really weren't

1 sick people. They were --

2 CDR. BRYAN: They were volunteers,  
3 yes.

4 MEMBER HAYWOOD: Right.

5 CDR. BRYAN: They were well.

6 MEMBER HAYWOOD: They weren't  
7 patients. They were persons.

8 CDR. BRYAN: Yes. I misspoke. Thank  
9 you.

10 The laboratory methods, we used the  
11 Behringer-Mannheim test. This was done at the  
12 University of Florida. And we looked at our  
13 endpoints in terms of 10, 20, and 33 mIUs per ml  
14 as considered positive.

15 Thirty-three was picked because I  
16 understand that may be a level or a concentration  
17 that Behringer might propose as both a sensitive  
18 and specific level for detecting anti-HAV in the  
19 general population. But in terms of vaccine  
20 antibody development or detection, certainly  
21 these appear to be very realistic.

22 Next slide, please. Therefore, we  
23 enrolled, today, 237 volunteers. This is a  
24 misprint. There were 36 that were excluded. So,  
25 ma'am, your question about how many had antibody.

26 There were 21, or 9 percent, of the 237 that had

1 antibody against hepatitis A.

2           There were 15 patients who after  
3 enrollment declined to participate. Most of  
4 those were at the Annapolis site. It's a site  
5 about 60 miles away. And there were just some  
6 difficulties in managing that. And patients  
7 actually weren't vaccinated.

8           Next slide, please. So if Colonel  
9 Fogelman thinks I'm trying to be shadowy about  
10 this, I know it's difficult to read these dark  
11 numbers, but maybe we can go through this.

12           The characteristics of the vaccinees  
13 that included -- there were 100, basically, in  
14 each group. Seventy-three percent were male in  
15 the Havrix, 67 percent of the Vaqta females,  
16 certainly also in proportion to what we have in  
17 the Medical Corps.

18           The age, mean age, was 31 and 30.5  
19 years with a range of 20 to 65 and 20 to 52  
20 years. Eighty-one percent and 84 percent were  
21 officers enlisted mostly from Annapolis, 9, and  
22 then, very shadowy here, 10 civilians and 8  
23 civilians in each of the 2 groups respectively.

24           Next slide, please.

25           MEMBER ALLEN: The two groups that  
26 you've got there, the Havrix and the Vaqta,

1 that's by basis of first vaccine?

2 CDR. BRYAN: Yes, sir, that's correct.

3 So guess what we found. Two weeks;  
4 that is, 14 plus or minus 2 days after the first  
5 dose, then those receiving Havrix of 89 that we  
6 have evaluated so far. And we still have some  
7 more to evaluate. As you notice, we had  
8 basically 100 in each group.

9 Twenty-eight percent of those received  
10 Havrix at least 10 mIUs per ml of antibody  
11 determined by this Behringer-Mannheim test  
12 compared with 41 percent of those who received  
13 Vaqta. At four weeks, 88 percent of those who  
14 had received Havrix and 92 percent of those who  
15 received Vaqta had detectable antibody.

16 They did a geometric mean  
17 concentration on those that had at least ten mIUs  
18 per ml. And that was basically everybody was  
19 positive. I think there was one person who had  
20 an antibody concentration of 8.8. But basically  
21 everybody that was positive had at least ten mIUs  
22 per ml. So the geometric mean concentration was  
23 164 versus 241.

24 So I think that tells me that yes, you  
25 can detect antibody after two weeks, certainly  
26 not in the majority at two weeks, but certainly

1 at four weeks, most people do have detectable  
2 antibody.

3 Next slide, please. If we look at  
4 that 33 mIUs per ml as a positive cutoff, the  
5 numbers really don't change very much: 26  
6 percent and 38 percent at 2 weeks, 85 percent and  
7 91 percent at 4 weeks.

8 Next slide, please. This slide is a  
9 little bit rough. I apologize. We just got  
10 these back at 4:00 p.m. yesterday. Both of these  
11 vaccines are very well-tolerated. I have been  
12 very impressed with how well they are tolerated.

13 One and zero percent had fever.  
14 Forty-six and 38 percent had tenderness. That is  
15 less than half of the people who got the vaccine  
16 four hours later complained of any tenderness or  
17 pain. It's much less in my experience than, say,  
18 influenza or tetanus or typhoid or anything like  
19 that. So these are very well-tolerated vaccines.  
20 Pain in 35 to 40, 24 percent; swelling in 5  
21 percent; warmth in 12 and 6 percent; and redness  
22 in 4 and 3 percent.

23 Next slide, please. Now, I wish I had  
24 the answer about interchangeability. I don't  
25 have any serologic data because these people, a  
26 number of them still are to receive their second

1 dose. But I do have data on the first 120 in  
2 terms of reactions.

3 And you can see that whether they  
4 received Havrix as their second dose of Vaqta as  
5 their second dose, that the tenderness was still  
6 less than 50 percent, rising from a third, to 46  
7 percent, complained of tenderness, pain in about  
8 a third, down to 19 percent. Swelling was  
9 unusual. Warmth again was unusual; redness and  
10 fever again after the second dose, unusual. So,  
11 again, these vaccines can be very well-tolerated.

12 Next slide, please. If I could  
13 conclude, what we have been able to determine so  
14 far is that antibody is detectable in about 28 to  
15 41 percent of the young, generally young. There  
16 were a couple of people that were older in this  
17 study but mostly students, healthy volunteers two  
18 weeks after a single dose of hepatitis A vaccine.

19 At four weeks, 88 to 92 percent had  
20 detectable antibody. As I said, both vaccines  
21 are tolerated remarkably well, including in the  
22 crossover groups. And in terms of this study,  
23 interchangeability data is still to be determined  
24 awaiting conclusion of the study.

25 Thank you for your attention. May I  
26 ask: Are there any questions?

1 PRESIDENT FLETCHER: Thank you,  
2 Commander Bryan.

3 Dr. Poland?

4 MEMBER POLAND: Did you have a chance  
5 to look at your data based on weight or age?

6 CDR. BRYAN: We do have the ages. In  
7 previous studies, we have looked at age. And one  
8 of the studies that we did was a study of persons  
9 who were over 30 years of age and 170 pounds.  
10 This is a fairly homogenous group in terms of  
11 age.

12 So there's really no way to really  
13 stratify. I don't have enough older patients in  
14 the study to say whether a young person is --

15 MEMBER POLAND: For example, the ones,  
16 the 10 to 15 percent or so, who didn't respond in  
17 2 weeks, were those the older or heavier  
18 patients?

19 CDR. BRYAN: I haven't looked at that  
20 yet.

21 Yes?

22 PRESIDENT FLETCHER: Please identify  
23 yourself.

24 MR. GRUBYELEPHANT: Steve  
25 Grubyelephant, Carriage Command.

26 Any thoughts about extending your

1 study out beyond three years, checking for titers  
2 beyond three years?

3 CDR. BRYAN: That could certainly be  
4 done. As you know, in the military, we get  
5 scattered out across the world pretty well. I've  
6 done follow-up studies. I'm trying to do one  
7 right now, in fact, in terms of mailing a tube  
8 and a mailer to someone somewhere and providing a  
9 Federal Express prepaid ticket for them to send  
10 these back. You can imagine how the logistics  
11 are, however. It's possible, but it requires a  
12 lot of attention to detail to do that.

13 PRESIDENT FLETCHER: In the four-hour  
14 reactions, were there any significant differences  
15 between the two? There were just some slight  
16 trends but nothing significant?

17 CDR. BRYAN: Because we're still  
18 ongoing, I didn't do the statistics on these  
19 because these are still preliminary.

20 PRESIDENT FLETCHER: Thank you.

21 LtCol. EGGERT: So the two images at  
22 two weeks, there's no significance?

23 CDR. BRYAN: No. I didn't calculate  
24 that yet because we're still getting data from  
25 one study.

26 PRESIDENT FLETCHER: Dr. Stevens?

1                   MEMBER   STEVENS:       Just to make a  
2                   comment, it's really nice to see this comparative  
3                   data for the first time. I think the other thing  
4                   that's really interesting is how rapid this  
5                   immune response is. It certainly fits with the  
6                   efficacy trial data, which basically, at least in  
7                   the Monroe study, there were no infections that I  
8                   recall after three weeks. So it's really a  
9                   beautiful demonstration of the immune response  
10                  here, rapid.

11                  DR. KUTER:   Barbara Kuter from Merck.

12                  If I could just comment on your  
13                  earlier question in regards to resistance to  
14                  antibody, I can tell you that we have a very  
15                  long-term study planned. But, as Dr. Bryan has  
16                  said, it's difficult to follow. We plan to  
17                  follow it for 10 to 20 years.

18                  PRESIDENT       FLETCHER:               Other  
19                  comments/questions?

20                  EXECUTIVE DIRECTOR FOGELMAN: The only  
21                  comment I have is that we will have Dr. Bryan  
22                  back once he completes the study so you can see  
23                  the results of interchangeability. But I thought  
24                  it would be nice to have time to talk to him  
25                  about the study design. Don't think we've  
26                  forgotten.

1 PRESIDENT FLETCHER: Very nice.

2 EXECUTIVE DIRECTOR FOGELMAN: Thank  
3 you very much.

4 PRESIDENT FLETCHER: Thank you,  
5 Commander.

6 CDR. BRYAN: Thank you.

7 (Applause.)

8 EXECUTIVE DIRECTOR FOGELMAN: Our next  
9 speaker will be Dr. Barbara Kuter from Merck,  
10 where she is the Director of Clinical Research  
11 and Vaccines. And she's going to talk about  
12 several studies which Merck has either completed  
13 or ongoing right now.

14 DR. KUTER: Good morning. As you can  
15 see, I'm suffering from one of those non-battle  
16 injuries.

17 EXECUTIVE DIRECTOR FOGELMAN: So I  
18 guess military readiness isn't exactly terrific  
19 right now.

20 Before you get started, I would  
21 mention that the handout which was given to you  
22 by Dr. Bryan should be kept confidential as well  
23 as the information you are going to hear now.

24 DR. KUTER: Okay. Thank you very  
25 much.

26 INTERCHANGEABILITY

1 DR. KUTER: It's a pleasure to be  
2 here. As I think all of you know, all of you  
3 collectively about a year ago, actually, filled  
4 out a statement regarding the topic of  
5 interchangeability. And I'm just going to read  
6 that to you.

7 It basically said in a January 22nd  
8 memo issued by the AFEB that "The hepatitis A  
9 vaccine from the two manufacturers can be  
10 considered comparably immunogenic and  
11 interchangeable. Either vaccine can be used to  
12 complete immunization series begun with the  
13 other."

14 And then this February, Dr. Martin,  
15 who was Acting Secretary of Defense, issued a  
16 similar memo to all the Surgeon Generals of the  
17 Army, Navy, Air Force basically confirming that  
18 recommendation.

19 We have been in numerous  
20 communications with both this group and Dr.  
21 Martin's office and have been providing the data  
22 to everyone regarding interchangeability. And  
23 what I'd like to do is show you some of that data  
24 that supports the recommendations.

25 Some of this you've probably heard  
26 before, and some of this will be a bit of an

1 update. In fairness to the investigators who  
2 have done this work, I would also ask that the  
3 information provided be considered confidential.

4 Some of this information has been  
5 published. Some of it has not. Some of it has  
6 been submitted for publication. And I would  
7 greatly appreciate if you respect the ability of  
8 those investigators to get this information out.

9 Well, there have been, actually, three  
10 studies designed to look at interchangeability of  
11 Vaqta and Havrix. And I am from Merck. And  
12 we're the ones who came on the market second. So  
13 we had the pleasure of setting up most of these  
14 studies.

15 The first study is a retrospective  
16 study. The second two studies are two  
17 prospective studies. And the design of those  
18 studies is shown here. The first study was  
19 simply a retrospective in which we got very lucky  
20 and happened to identify 43 individuals who had  
21 received Havrix for the first dose and Vaqta for  
22 the second.

23 The two prospective studies, the first  
24 is simply a comparison of two doses of Havrix; a  
25 mixed regimen of Havrix followed by Vaqta, which  
26 is predominantly the situation that most folks

1 are in today. And a third study has the two  
2 mixed arms going in both directions, Havrix to  
3 Vaqta and Vaqta to Havrix, and a control arm of  
4 two doses of Vaqta.

5 The first study, as I said, was a  
6 retrospective evaluation with 43 individuals who  
7 received Havrix for the first dose and Vaqta for  
8 their second dose. The interval between the two  
9 doses was anywhere from 5 to 19 months.

10 We identified these individuals,  
11 obtained IRB approval to then go back to these  
12 subjects and to get bloods on them anywhere from  
13 one to six months after the second dose. And  
14 then those results we compared to some of our  
15 historical data on the use of two doses of Vaqta.

16 This is the information that we  
17 obtained from that particular study in obtaining  
18 blood specimens one to six months after the  
19 second dose.

20 In the group that received the mixed  
21 regimen, we found that all 43 individuals had  
22 antibody by the modified HAVAB assay. As Dr.  
23 Bryan has described to you, that test was  
24 developed specifically to pick up vaccine  
25 responses since we know with the standard HAVAB  
26 assay, at least after the first dose, that you're

1 not able to pick up responses very easily and a  
2 titer of ten or greater is considered positive.

3 We found a geometric mean titer of  
4 about 2,500 in those 43 individuals. In  
5 comparison, we went back and looked at our own  
6 historical database and found individuals who had  
7 been bled one month after the second dose and as  
8 broad as six months after.

9 And what you see is that in 775  
10 individuals, that the geometric mean titer is  
11 right in the range that we expected. One month  
12 after, we had a high of almost 6,000. Six  
13 months, it's down to 1,600. So this 2,500 fits  
14 in that range quite nicely.

15 I should also tell you that in that  
16 particular study, that we took those very same  
17 sera and did use the commercial IMX HAVAB test,  
18 which does not give you an actual titer. It only  
19 gives you a positive or negative in all 43  
20 individuals who were positive after that second  
21 dose.

22 The second study is a prospective  
23 study, a double-blind, randomized study. Like  
24 Dr. Bryan's study, we had separate personnel for  
25 drawing up the vaccines and separate personnel  
26 for the clinical and serologic follow-up. That

1 study was designed to have 510 individuals in it.

2 The study has just recently been completed,  
3 literally about two weeks ago.

4 Joe and I are going to have a  
5 competition here because I think I actually had  
6 the later slide. One of my slides showed up at  
7 6:50 this morning. You'll see which one.  
8 Anyway, so this is also a preliminary look at the  
9 complete data set.

10 But in this study again, all of the  
11 individuals received Havrix for the first dose.  
12 And then we randomized in a two to one ratio,  
13 with a third of the subjects receiving Havrix for  
14 second dose and two-thirds receiving Vaqta for  
15 second dose. And, similar to the previous, we  
16 obtained bloods prior to dose two and one month  
17 after the second dose.

18 Well, as of 6:50 this morning,  
19 courtesy of a fax here, these are the clinical  
20 data that we have for this particular study.  
21 What we did was we took the most common adverse  
22 experiences, those that are reported at the  
23 highest rates, and just picked up the top five  
24 events.

25 With the mixed regimen, Havrix  
26 followed by Vaqta, after the second dose we had

1 about 37 percent with any injections. This could  
2 be pain, warmth, tenderness, comparison with two  
3 doses of Havrix. We had a slightly higher rate,  
4 60 percent. This is significantly different.

5 In terms of the other complaints that  
6 were reported post-vaccination, the most common  
7 complaints were: headache, no difference;  
8 diarrhea, no difference; fatigue, no difference;  
9 and colds, no difference.

10 MEMBER POLAND: Barbara, that is  
11 without regard to severity.

12 DR. KUTER: That is without regard to  
13 severity, yes. Thank you.

14 I should also tell you because I  
15 forgot to mention this that this is a bit of a  
16 different follow-up method. In these particular  
17 studies, individuals were handed a vaccination  
18 report card and completed the report card for 14  
19 days post-vaccination. So this is the sum of two  
20 weeks of clinical follow-up.

21 In terms of the serologic responses in  
22 this group, this is our preliminary analysis of  
23 one of the primary endpoints. We defined a  
24 priori at the beginning of this protocol, we  
25 defined that what we were looking for was a  
26 greater than or equal to tenfold rise in the

1 antibody level between the sample obtained  
2 immediately prior to the second dose and one  
3 month post the second dose and also that that  
4 titer had to be at least as high as 100 mIU per  
5 ml.

6 The reason for this is that we assumed  
7 from our previous studies that we always saw a  
8 very large whole increase between the first and  
9 the second dose. Long differences are very  
10 common between the responses after dose one  
11 compared to dose two.

12 And we also wanted to make sure that,  
13 in fact, we were getting a high enough response  
14 and that we weren't simply picking up the primary  
15 response. Hence, we focused on that we also  
16 wanted the titers to be greater than 100 mIU per  
17 ml.

18 In using that criteria, we found that  
19 in the mixed regimen, Havrix followed by Vaqta,  
20 that we had 85 percent who met this criteria  
21 after the second dose. And, in comparison with 2  
22 doses of Havrix, we had 80 percent. You see the  
23 confidence intervals. They do overlap. These  
24 numbers are not different.

25 To summarize that data in just a  
26 little different fashion, we also looked at

1 simply the seropositivity rates after -- that's  
2 SPR -- and the geometric mean titers in the two  
3 groups comparing the responses.

4           Immediately prior to dose 2, -- this  
5 is at basically months 6 to 12 after the first  
6 dose -- we had 89 percent with antibody after the  
7 first dose of Havrix here, 90 percent here, no  
8 difference. We had geometric mean titers of  
9 about 75 here and 96 here in this group.

10           When we looked at the response after  
11 the second dose, we had virtually everyone  
12 seroconverting except one individual in this  
13 group and one individual in this group. And you  
14 see a very high rise in the titer levels between  
15 the time interval between the administration of  
16 the dose and the full rise. Taking the  
17 calculation of these 2 numbers here, it was 44  
18 for the mixed regimen and here 26 for the  
19 straight Havrix regimen.

20           In the packet that I've handed out to  
21 the AFEB members is the published abstract. This  
22 information was put together by Dr. Brad Connor  
23 in abstract, presented at a late-breaker at the  
24 American Society for Tropical Medicine and  
25 Hygiene. That is in your packet. That was  
26 presented in December of 1997. Obviously the

1 information that I've shown you today is an  
2 update of that, but it is published in that  
3 fashion.

4 And the last study, for which I do not  
5 have any data but will be happy to come back and  
6 share with you that data when we do get it, is,  
7 in fact, the study in which we have the  
8 three-armed study, the two mixed regimens  
9 compared to two doses of Vaqta.

10 Again, it's a prospective, randomized  
11 study, double blind. And in this study, we are  
12 starting all the follow-up, as Dr. Bryan is doing  
13 in his study, beginning at time zero with bloods  
14 at months one, six, and seven corresponding to  
15 the same responses immediately prior to the  
16 second dose and immediately after.

17 To date, we have 215. It should be of  
18 270 individuals enrolled. We'll probably have  
19 everyone enrolled I think within about the next  
20 two weeks.

21 So that is the summary of the data  
22 that we have to date on this topic. I think the  
23 information clearly supports the recommendation  
24 that has been made, which is that the vaccines  
25 are interchangeable. We don't see any problems  
26 with reactogenicity when we have a mixed regimen.

1                   That's the information I have for you.

2                   And I'll be happy to answer any questions.

3                   PRESIDENT FLETCHER:    Thank you, Dr.  
4                   Kuter.

5                   Let me just comment.  This study is in  
6                   collaboration with Dr. Poland, and you are  
7                   working together on this?

8                   DR. KUTER:    That is correct, correct.

9                   PRESIDENT FLETCHER:    Nice interchange  
10                  between the Board and the industry.

11                  DR. KUTER:    Yes, exactly.  Dr. Poland  
12                  is one of the investigators on this last study  
13                  and I think is going to have the honor of  
14                  publishing it as well.

15                  PRESIDENT FLETCHER:    Dr. Stevens?

16                  MEMBER STEVENS:    That was my question:  
17                  Who was doing the studies?

18                  PRESIDENT FLETCHER:    Dr. Poland.

19                  MEMBER POLAND:    I don't know about the  
20                  retrospective study.

21                  DR. KUTER:    The retrospective study  
22                  was actually identified for individuals.  Merck  
23                  identified that study.  The second study that I  
24                  showed you has been done at a number of travel,  
25                  medicine clinics throughout the United States:  
26                  Dr. Brad Connor in New York; John Farrin,

1 Chicago; David Sach at Hopkins; and I forgot  
2 someone here. Dr. David McInerny, Tacoma,  
3 Washington.

4 PRESIDENT FLETCHER: Comments or  
5 questions?

6 (No response.)

7 DR. KUTER: Great. Thank you.

8 (Applause.)

9 PRESIDENT FLETCHER: I think we are  
10 catching up. It's about a 10-15-minute break.

11 Let me comment. In the restrooms, -- I've only  
12 had the privilege to go to the men's restroom,  
13 but they've got data on the wall about  
14 cholesterol and high blood pressure. So we might  
15 look at that as a spirit of health maintenance.

16 EXECUTIVE DIRECTOR FOGELMAN: Before  
17 you leave, if there is anyone who has not signed  
18 up for dinner who wants to sign up for dinner,  
19 please do so because I am going to turn in the  
20 list and also your lunch ticket. If you haven't  
21 turned that in, you'd better turn it in quickly.

22 (Whereupon, the foregoing matter went  
23 off the record at 9:23 a.m. and went  
24 back on the record at 9:42 a.m.)

25 PRESIDENT FLETCHER: We will follow  
26 this at the end by a bit of orientation for our

1 activities this afternoon after our sessions this  
2 morning. We're pretty much on time.

3 I appreciate everyone being as such  
4 because the questions are an absolute part of  
5 these sessions, they are vitally important. So  
6 those of you speaking please keep time for the  
7 Board members to make comments, ask questions.  
8 And interchange is very important.

9 Colonel Fogelman?

10 EXECUTIVE DIRECTOR FOGELMAN: Okay.  
11 Our next discussion will be a follow-up on the  
12 G-6-PD testing question, which we had some time  
13 ago. Captain Tony Littrell, I guess you are  
14 finishing your residency now at --

15 CAPT. LITTRELL: Yes, ma'am.

16 EXECUTIVE DIRECTOR FOGELMAN: --  
17 Walter Reed Army Institute of Research?

18 CAPT. LITTRELL: That's right,  
19 graduating June the 19th hopefully, --

20 EXECUTIVE DIRECTOR FOGELMAN: Great.

21 CAPT. LITTRELL: -- if all goes well.

22 EXECUTIVE DIRECTOR FOGELMAN: Great.

23 PRESIDENT FLETCHER: Good.

24 EXECUTIVE DIRECTOR FOGELMAN: He's  
25 done a cost-effectiveness study of G-6-PD  
26 testing, which he will present today. You should

1 all have a handout on this; right? If you don't,  
2 we can find one for you.

3 COST EFFECTIVENESS OF G-6-PD TESTING (FOLLOW UP)

4 CAPT. LITRELL: Good morning,  
5 everyone, ladies and gentlemen of the Board and  
6 public health colleagues. I'm going to talk to  
7 you today about a cost-effective analysis study  
8 that I've done on G-6-PD screening in U.S. Army  
9 troops deploying to malarious areas.

10 Again, I'm Captain Tony Littrell from  
11 WRAIR. I became interested in this project as a  
12 result of working with Colonel Dennis Shanks in  
13 Kenya on a chemoprophylaxis trial with our new  
14 primaquine analog anaquine.

15 Next slide. A little bit of  
16 background. G-6-PD is an enzyme in the Pentose  
17 phosphate pathway. It is involved in glucose  
18 metabolism. It converts NADP+ to NADPH. G-6-PD  
19 deficiency is a sex-linked genetic disorder with  
20 full penetrance in males. And persons who are  
21 deficient in this enzyme and receive the  
22 anti-malarial drug primaquine are at increased  
23 risk for experiencing a hemolytic anemia event.

24 Next slide. Genetic variants. There  
25 are over 400 to date since the enzyme's discovery  
26 in 1956. The A- variant is the most important

1 military variant, affects approximately ten  
2 percent of African American males.

3 The B- variant is the most common type  
4 affecting people of Eastern Mediterranean and  
5 Caucasian origin. And some would argue it's the  
6 more important of the two variants because it is  
7 much more severe.

8 Next slide. The frequency of the B-  
9 variant varies markedly among different  
10 populations. It can be as high as one percent in  
11 American Caucasian populations; from two to nine  
12 percent in Greek, ethnic Greek; one-half to one  
13 percent in mainland Italians. It goes higher as  
14 you go further south along the peninsula. And  
15 then on the Island of Sardinia, it can be as high  
16 as 35 percent in some of the study populations.  
17 And incidence or prevalence as high as 50 percent  
18 has occurred in Kurdish Jews.

19 Next slide. Just a list of --

20 MEMBER LaROSA: Can I ask a question?

21 CAPT. LITTRELL: Yes, ma'am. Sure.

22 MEMBER LaROSA: I'm confused about  
23 Caucasians and Greeks, Italians, Sardinians, and  
24 Kurdish Jews.

25 CAPT. LITTRELL: Yes, ma'am.

26 MEMBER LaROSA: You're making a

1 differentiation between Americans and -- ? I'm  
2 confused.

3 CAPT. LITTRELL: Okay. These are just  
4 prevalence levels that have been shown in various  
5 studies of this particular variant.

6 MEMBER LaROSA: But these were  
7 American Caucasians of any ethnic background?

8 CAPT. LITTRELL: No. These would all  
9 be Greek populations, Italian, Sardinian, Kurdish  
10 Jew. The one percent refers only to American  
11 Caucasians.

12 MEMBER LaROSA: But what are American  
13 Caucasians? Are they not of any of those  
14 backgrounds?

15 CAPT. LITTRELL: Yes. Yes, they are.  
16 And so they would be included in this as an  
17 aggregate in American Caucasians.

18 MEMBER BARRETT-CONNOR: In other  
19 words, the studies of the Greeks were done in  
20 Greece?

21 CAPT. LITTRELL: That's right. That's  
22 right. Next slide. Thanks for pointing that  
23 out.

24 Just a list of commonly used  
25 medications that have been shown to cause or be  
26 capable of causing drug-induced hemolysis. As

1 one would expect, the degree of hemolysis  
2 produced by these various drugs depends upon the  
3 amount of drug which is ingested and the type of  
4 deficiency that is present.

5 Next slide. Primaquine is the most  
6 widely used anti-malarial drug known to cause  
7 hemolytic anemia in individuals with G-6-PD  
8 deficiency. It's currently the only FDA-approved  
9 drug to be used as a tissue schizonticidal agent.

10 There are two dosing regimens which  
11 are currently approved by the United States Army.

12 There are 15 milligrams of primaquine base taken  
13 daily for a total of 14 days or 45 milligrams  
14 once a week for a total of 8 weeks. Either of  
15 these two dosing regimens are considered to be  
16 safe to administer to African American males.

17 Next slide. In African American  
18 soldiers who are G-6-PD deficient and receive a  
19 daily dose of 30 milligrams of primaquine base,  
20 hemolysis generally proceeds through 3 distinct  
21 phases and is most often self-limiting.

22 Next slide. This is just a cartoon  
23 taking you through the process of the acute  
24 recovery and equilibrium phases. Hemolysis  
25 usually appears on or about the fifth to seventh  
26 day.

1                   We see an acute drop in the hematocrit  
2                   associated with an increase in hemoglobinuria,  
3                   progressive, usually occurring between 5 to 7  
4                   days, then backing off as the hematocrit drops  
5                   between 33 to 50 percent, and then a slow  
6                   recovery marked by increased reticulocytosis as  
7                   the older erythrocytes are lysed and they are  
8                   replaced by younger erythrocytes that are still  
9                   producing enzyme.       And then you reach an  
10                  equilibrium phase, which you can then give drug  
11                  over a period of time during a military  
12                  operation, like we did in Vietnam for years at a  
13                  time.

14                  Next slide.       In a patient with a  
15                  Mediterranean or Asian variance, serious  
16                  hemolysis can occur following even one or 2 doses  
17                  of 15 milligrams of primaquine base.   And this  
18                  can lead to the destruction from anywhere from 50  
19                  to 100 percent of the red blood cells.   When this  
20                  kind of severe hemolysis does occur, patients are  
21                  in need of immediate blood transfusions and are  
22                  subject to complications, which include acute  
23                  renal failure, high-output cardiac failure,  
24                  anoxia, and possibly even death.

25                  Next slide.       Factors influencing the  
26                  severity of hemolysis include viral, parasitic,

1 or bacterial infections, liver or renal disease,  
2 which affects drug excretion and/or drug  
3 metabolism, administration of oxidative drugs,  
4 such as primaquine and dapsons concurrently, as  
5 well as the presence of other enzyme deficiencies  
6 which affect red blood cell metabolism and place  
7 an oxidative stress on red blood cell membranes.

8           Next slide.           Currently both  
9 qualitative and quantitative tests are available  
10 for detection of this enzyme deficiency.

11 Qualitative tests are available in a variety of  
12 diagnostic kits, are relatively inexpensive, are  
13 suitable for testing large numbers of soldiers or  
14 civilians, and have a high degree of sensitivity  
15 and specificity.

16           Next slide.           The first and most  
17 commonly used of these tests is the fluorescent  
18 spot test. Basically you take a small amount of  
19 whole blood and you mix it with  
20 glucose-6-phosphate and NADP. And then you blot  
21 this onto filter paper. Then you view it under  
22 an ultraviolet light after a few minutes.

23           And if fluorescence is clearly evident  
24 in the mixtures prepared from normal blood,  
25 you'll see fluorescence. And in samples that are  
26 deficient, you should see little or no

1 fluorescence.

2           Next slide. Now, this is describing a  
3 visual calorimetric semi-quantitative test. And  
4 it's basically used for visual screening of  
5 G-6-PD levels in whole blood. The test is  
6 performed by adding 50 microliters of whole blood  
7 to 2 and a half milliliters of deionized water.  
8 This prepares a hemolysae.

9           You then mix that with the reagents,  
10 and you place it in a water bath. So the test  
11 takes about one hour to complete. And what  
12 you're observing is a color change. It starts as  
13 blue and if you're normal, you should change to  
14 pink relatively quickly. If there is any hint of  
15 blue left in the glass vial, you can then assume  
16 that this person has a deficiency. The nice  
17 thing about this test is then using a  
18 spectrophotometer, you can determine the level of  
19 deficiency.

20           Next slide. Okay. Now I'm going to  
21 switch gears and talk to you about the  
22 cost-effective analysis that I've done comparing  
23 these three options: the no-screening option,  
24 which is the -- currently the U.S. Army policy of  
25 treating all soldiers with primaquine who are  
26 deployed to a region endemic with vivax malaria;

1 or no screening compared to a policy of  
2 pre-deployment, G-6-PD screening as part of a  
3 routine preparation to go overseas into a  
4 vivax-endemic region; or a policy of  
5 post-deployment screening, which would occur  
6 prior to departure and initiation of  
7 chemoprophylaxis after leaving an endemic  
8 country.

9 Next slide. Okay? What I did was I  
10 prepared a 10,000-soldier combined arm task  
11 force, which is to be deployed to an area which  
12 would be in a highly endemic region for vivax  
13 malaria.

14 Next slide. This is the racial and  
15 ethnic distribution. As you can see, the  
16 majority of it is Caucasian and Asian, 75  
17 percent, with the other 3 ethnic groups making up  
18 the remaining portion, and 15 percent black  
19 population. This is because I selected highly  
20 deployable units. It would be somewhat higher in  
21 the overall Army population for African  
22 Americans.

23 Next slide. This is the recruit  
24 screening data that I received from the Great  
25 Lakes Naval Recruiting Station, from Lieutenant  
26 Commander Margaret Ryan, Megan. And she showed

1 that they have an overall prevalence rate of 2.5  
2 percent in her population. This data was  
3 collected from the entire year of 1997.

4 Stratified by race and ethnicity, we  
5 see that in her population, Caucasians were much  
6 lower than what has been seen in other  
7 populations, .4 percent; African Americans,  
8 around 10 percent, which is sort of historically  
9 what has been quoted in the literature;  
10 Hispanics, one percent; Native Americans, Alaskan  
11 Indians, half a percent.

12 And this is quite significant here,  
13 Asians at three and a half percent, because there  
14 are many Asian variants which can cause quite  
15 severe hemolysis when taking primaquine. And  
16 there are documented cases.

17 Next slide. The cost-effective  
18 analysis model must identify and quantify the  
19 most relevant epidemiological factors while  
20 keeping the model as simple and understandable as  
21 possible. And that is quite a challenge.

22 This study identified these as the  
23 most important epidemiological parameters of the  
24 study. The prevalence of the deficiency and the  
25 type, the sensitivity and specificity of the test  
26 used, the attack rate of plasmodium vivax, the

1 probability of an individual developing hemolytic  
2 anemic syndrome, which is a coin that I phrased  
3 [sic.] to describe a hemolytic event and its  
4 sequelae and the rate of relapse following the  
5 use of primaquine. By "relapse," I mean treated  
6 once and then they would go on to develop a case  
7 of vivax malaria.

8           Next slide. Okay. The probability of  
9 becoming a case in this very simple model that I  
10 used would be related to three major factors:  
11 the G-6-PD prevalence and type in the population,  
12 the drug compliance, and the probability of a  
13 hemolytic event. If each one of those is at the  
14 right level, then you would develop a case. The  
15 example I'm using here is for Caucasians.

16           So we take the .004 prevalence,  
17 multiply in this case by 100 percent drug  
18 compliance, and then a probability of hemolytic  
19 anemic syndrome of .25, or one case in 4  
20 individuals who would be deficient. And you  
21 would develop one case for every 1,000 soldiers  
22 at risk.

23           And then these are the probabilities  
24 of a hemolytic event that I used for the base  
25 case for the A-, .001, or 1 in every 1,000,  
26 deficient African American males; and the same

1 here, 1 in 4 deficient B- variants.

2 Next slide. After a thorough review  
3 of the literature and discussions with experts in  
4 G-6-PD genetics and molecular biology and reading  
5 our experience categorizing chloroquine,  
6 primaquine chemoprophylaxis, the following  
7 probabilities were used and assigned at the  
8 chance nodes.

9 What that means is in the back of your  
10 handout, you will look and you will see the  
11 decision tree. You will see the numbers  
12 underneath. These are sort of the main basic  
13 numbers that I used to derive the subsequent  
14 costs that I'm going to show you.

15 Next slide. Okay? So the costs we  
16 need to consider. And that would be the cost of  
17 the screening test itself plus reagents, which is  
18 currently around two dollars, and then additional  
19 costs associated with drawing of blood and then  
20 entering those results into an electronic  
21 database.

22 And then basically if we add the two  
23 and the four dollars and we look at four dollars  
24 as being sort of a general figure for all of  
25 those things, then we might be able to reduce  
26 that cost or it may increase a little bit. We

1 get a general sort of screening cost of between  
2 four and six dollars per soldier screened.

3 Next slide. Then we have to take the  
4 cost of the drugs. Chloroquine currently costs  
5 about one dollar per week, and primaquine is  
6 estimated in Korea at \$3.80 per week  
7 administered.

8 Next slide. Now we have to consider  
9 the costs. And these are the direct medical  
10 costs of a case. It's hemolytic anemia and its  
11 sequelae.

12 And so we see this is for an eight-day  
13 inpatient stay at a tertiary care medical center,  
14 Walter Reed Army Medical Center, \$12,040; an  
15 additional \$1,480 in treatment, primarily blood  
16 products; and then some specific lab tests that  
17 are needed to make the diagnosis and to follow  
18 the course of the disease.

19 And then the sequelae, which are quite  
20 significant, would include acute renal failure,  
21 which is also a seven to eight-day inpatient stay  
22 in an intensive care ward or at least a  
23 high-maintenance medical ward; and then the  
24 additional costs associated with temporary  
25 dialysis to allow the individual to get beyond  
26 the renal failure event. All of these costs were

1 taken from Walter Reed.

2 Next slide. How effective a G-6-PD  
3 deficiency screening program is going to be is  
4 related to mostly, almost the same events as the  
5 overall cost-effectiveness analysis, and that is  
6 the frequency and type of deficiency, the  
7 sensitivity and specificity of the test, the  
8 malaria attack rate, and the probability of  
9 becoming a case of hemolytic anemic.

10 Next slide. So you're all familiar  
11 with these, the infamous two by two table. You  
12 can see that this is for African American males  
13 who are deficient or this would be for the entire  
14 population. And what we're trying to do is to  
15 identify out of the 10,000 that we're screening  
16 the 1,000 who would be deficient.

17 With a 90 percent sensitivity, we're  
18 going to identify 900. We're going to have 100  
19 false negatives and then likewise for the  
20 specificity. And so what we end up with is a  
21 positive predictive value because of the high  
22 prevalence of greater than 90 percent, a very low  
23 false negative rate of just over one percent.

24 Next slide. Now, when we do this in  
25 the B- or the Caucasian population, the 10,000,  
26 the prevalence is much lower. Okay? You still

1 identifying the same 90 percent, but, as you well  
2 know, the positive predictive value due to the  
3 low prevalence is going to drop way off, to  
4 around 26 percent.

5 But your false negatives, which is the  
6 most important here, is also very, very low, or 4  
7 cases in 10,000, only one of which we're  
8 predicting would go on to become a hemolytic  
9 event. So basically you would have one false  
10 negative case in 10,000 individuals screened.

11 Next slide. These are the base case  
12 measures of effectiveness that I used in the  
13 study. And what I did was I looked at, predicted  
14 the cases of hemolytic anemia syndrome that could  
15 be prevented through a screening program. And I  
16 balanced this against the excess cases of malaria  
17 that would result from that screening program,  
18 the assumption being that if we're going to  
19 screen and they're deficient, we wouldn't give  
20 them primaquine

21 Next slide. The health outcomes are  
22 at the terminal nodes. And they include  
23 basically a healthy, uninfected soldier, someone  
24 who went to the region, didn't become infected,  
25 took primaquine and did fine, and came back.

26 The asymptomatic infected soldier,

1 somebody who becomes infected, doesn't have  
2 symptoms, comes back to the United States, and  
3 then would develop a case of vivax at a later  
4 point. And I used a one-year follow-up period.

5 And then new cases of malaria as a result of  
6 screening, a hemolytic event, and then the  
7 relapsing cases of malaria that were treated with  
8 primaquine.

9 Next slide. Okay? And this is sort  
10 of the whole cost-effective analysis put together  
11 for you to look at. Here is the cost of the  
12 drugs for a 10,000 soldier task force. It drops  
13 a little bit in your pre-screened and  
14 post-screened because we're not going to give  
15 those individuals who test deficient any drug.

16 The screening program for a  
17 pre-screening I assumed would be slightly more  
18 efficient. And we may be drawing blood on these  
19 individuals for other reasons. And, therefore,  
20 we would just be able to take a small aliquot of  
21 that blood and do the test.

22 And this is a cost that I associated  
23 with an increased level of medical surveillance,  
24 which would be needed in those G-6-PD deficient  
25 individuals who may become infected and did not  
26 receive primaquine. And so one of the things we

1 could do was we could do a screening blood smear  
2 on them and see if we could identify parasites.

3 The model predicted that for the  
4 no-screening option, we would develop 9 cases in  
5 a 10,000 man forces. And you can see that that  
6 compares to one case in each of the screened  
7 populations.

8 And then here is where you sort of get  
9 your bang for your buck: your direct medical  
10 costs, \$175,000 for those 9 cases versus \$20,000  
11 for one case.

12 And these are your excess malaria  
13 costs. I was very conservative here. The model  
14 predicted about 30 excesses cases of malaria.  
15 And so I used a figure of \$250,000 for  
16 uncomplicated course of treatment of vivax  
17 malaria.

18 When you run the numbers, you see that  
19 pre-screening saves you about \$45,000 in direct  
20 medical costs. And post-screening because the  
21 screening is more expensive saves you about  
22 \$25,000. Both of them result in less disease  
23 non-battle injury days lost.

24 Next slide. This table basically  
25 takes that same information and then allows us to  
26 compute what's called a cost-effectiveness

1 incremental ratio. And so what we do, we compare  
2 the costs. We come up with an incremental cost  
3 savings. We divide that over the total number of  
4 cases prevented.

5 And you can see that for  
6 pre-deployment we're talking about almost \$6,000  
7 per case that we would be able to prevent. It  
8 would save us almost \$6,000. And for the  
9 post-deployment, it would be around \$3,000.

10 Next slide. This is a sensitivity  
11 analysis on the probability of being deficient.  
12 So what we have is we have an estimate of what  
13 the overall population would be. Okay?

14 We're estimating at around 10.1  
15 percent, which when we run up, you look at that  
16 as your probability of being deficient goes up,  
17 your costs automatically go up because your  
18 probability of a hemolytic event goes up. And  
19 you can see that this is basically a straight  
20 line up; whereas screening, because it holds it  
21 down to one case per 10,000, is flat.

22 And so basically this predicts that it  
23 would be cost-effective to screen even African  
24 American males. And it would cost you around \$33  
25 in total cost for the entire program.

26 Next slide. This is the same analysis

1 done on a B- variant and, again, even a steeper  
2 curve here because of the much more higher  
3 likelihood that an individual could go into  
4 hemolytic anemia. And we see it's cost-effective  
5 at a very, very low prevalence rate of basically  
6 5 cases in 10,000 individuals that are screened.

7 So in the population used, we had a  
8 prevalence rate of around one percent. So we're  
9 talking 100 individuals. And this is saying it's  
10 cost-effective of around five.

11 Next slide. So how cost-effective is  
12 screening? Only a small number of recruits will  
13 be exposed to -- in recruits. I'm sorry. This  
14 is an important distinction. Okay?

15 The thing that changes the model here  
16 is that only a small number of your recruits are  
17 going to be exposed in any given year because the  
18 likelihood is that most of them would go on to do  
19 other duties and they wouldn't necessarily be  
20 involved in an operation where they would be  
21 exposed to vivax malaria.

22 Will the screening test be available  
23 when needed? The Air Force and the Navy  
24 currently do screening, but there is no  
25 documented evidence that this information is  
26 available when it's needed to influence a policy

1 decision about chemoprophylaxis.

2 And then do we change the threshold  
3 for using anti-malarial chemoprophylaxis?

4 Because we now have screened individuals who may  
5 be less hesitant to use chemoprophylaxis. And  
6 then high volume could reduce to lower costs.

7 Next slide. And this is comparing the  
8 most favorable of the three options from the  
9 previous slide, the pre-deployment screening, to  
10 recruit screening.

11 And the punch line here is big costs  
12 for screening, which is no surprise to any of you  
13 in this room, because, even if we reduce the  
14 screening cost to \$2.50 to get 10,000 exposed  
15 soldiers, we've got to screen 100,000 and only  
16 10,000 are likely in any given year to be  
17 exposed.

18 So, as you can see, big difference in  
19 cost. Savings achieved by just screening a  
20 deployed force could be around \$200,000. And  
21 they would have equal effectiveness.

22 Next slide. The limitations of this  
23 study. B- deficiencies in U.S. active-duty  
24 populations are not available in the literature.

25 In fact, to my knowledge, this data that I have  
26 is probably the best largest sample that we have

1 to work with.

2 Incidence data on hemolytic anemia  
3 sequelae in United States soldiers taking  
4 primaquine is basically not available. And then  
5 the effect of the absence of a Duffy factor on  
6 malaria transmission in African Americans is an  
7 unknown factor. We know it reduces transmission,  
8 but to what level we don't. And then this study  
9 has limited costs to direct medical costs.

10 I wanted to be as conservative as  
11 possible. The reality is that your evacuation  
12 and rehabilitation costs and your loss in theatre  
13 would result in even more costs.

14 Next slide. So summary. Screening  
15 shown to reduce the number of expected cases by  
16 threefold, 300 percent. Primaquine deferral in  
17 soldiers testing G-6-PD-deficient results in a  
18 small number of excess cases of plasmodium vivax  
19 malaria. And this is in a highly endemic area.

20 Next slide. Conclusions. Pre and  
21 post-deployment screening shown to be  
22 cost-effective in a highly endemic region. And  
23 pre-deployment screening saves you \$210,000 over  
24 recruit screening with the same number of cases  
25 prevented.

26 Next slide. Recommendations. Colonel

1 Fogelman asked me to come up with a list of  
2 recommendations to you. Basically I say that if  
3 commanders decide to institute a policy of  
4 chloroquine and primaquine chemoprophylaxis,  
5 whether it be in Korea or anywhere else, in the  
6 future, I recommend that all soldiers who receive  
7 primaquine should be screened prior to receiving  
8 the drug. And if found to be deficient, they  
9 should not receive this drug.

10 The Army should provide funds to begin  
11 a G-6-PD prevalence survey to better define the  
12 magnitude of this problem. And, to that end,  
13 Colonel Sanchez and I from the Chipham have  
14 discussed possibly doing a G-6-PD prevalence  
15 survey in Korea as early as this summer if  
16 possible.

17 And then, last, I think we should  
18 continue to adequately fund research for better  
19 alternatives to primaquine, especially for the  
20 treatment of plasmodium vivax and novalia  
21 (phonetic) infections.

22 I'd be happy to answer any questions  
23 that you have at this time.

24 PRESIDENT FLETCHER: Thank you,  
25 Captain.

26 Dr. Stevens?

1                   MEMBER STEVENS:    Since the B- variant  
2    is concentrated in Mediterranean populations, --

3                   CAPT. LITTRELL:    Yes, ma'am.

4                   MEMBER STEVENS:    -- did you look at  
5    the possibility of screening based on the  
6    maternal ancestry of the troops and whether that  
7    could be a --

8                   CAPT. LITTRELL:    That issue has been  
9    brought up.    And that would certainly be an  
10   option that could be exercised.    However, I can  
11   tell you that we looked at some data on various  
12   studies    about    self-reporting    of    ethnic  
13   background.    And what we find is that it's quite  
14   unreliable data.    And, as a result of that, I  
15   wouldn't recommend it.

16                   And, in fact, what's done at the Navy  
17   is they ask individuals if they know whether or  
18   not they have a history of being G-6-PD  
19   deficient.    A large number say yes.    And of that  
20   number, none of those individuals that said they  
21   were deficient actually tested deficient.

22                   MEMBER STEVENS:    But that's something  
23   you could do as far as your study if you were  
24   going to do a screening to see how accurate.

25                   CAPT. LITTRELL:    That's right.

26                   PRESIDENT FLETCHER:    Dr. Haywood?

1                   MEMBER HAYWOOD:       Does your model  
2     anticipate equal exposure, despite screening?

3                   CAPT. LITTRELL:        Yes, sir.        I  
4     considered among all the options.    The exposure  
5     was 20 percent infectivity, or an attack rate of  
6     20 percent.    And I looked at this being equal in  
7     terms of across all ethnic backgrounds.   Twenty  
8     percent would become infected during the  
9     deployment.

10                   And then, of course, we know that in  
11    African Americans, that would be lower.

12                   MEMBER HAYWOOD:    But if you screened  
13    pre-deployment, then you could divert the  
14    deployment; right? You would reduce risk by --

15                   CAPT. LITTRELL:    We could reduce risk,  
16    but the important point to remember here is that  
17    the institution of primaquine is a preventive  
18    therapy.

19                   MEMBER HAYWOOD:    Right.

20                   CAPT. LITTRELL:        It's not a  
21    prophylactic therapy.    And vivax malaria is a  
22    very treatable condition.   And so the loss of a  
23    soldier who is highly trained in today's highly  
24    technological and motivated military, the loss of  
25    that individual to that deployment in some cases  
26    could be catastrophic.

1                   And so the idea here is that we need  
2                   to identify that population and we need to  
3                   understand it. We need to know how to treat them  
4                   the best possible way. And I don't think that  
5                   that impedes our ability to deploy those  
6                   soldiers.

7                   PRESIDENT FLETCHER: Other questions?

8                   MEMBER HAYWOOD: But you didn't figure  
9                   those costs, relative costs?

10                  CAPT. LITTRELL: No, sir.

11                  PRESIDENT FLETCHER: Dr. Clements?

12                  MEMBER CLEMENTS-MANN: Yes. I was  
13                  wondering: Since there is some screening going  
14                  on now but nothing is being done as a result of  
15                  the screening, how could you be sure that by  
16                  screening this time --

17                  CAPT. LITTRELL: Right. That's right.

18                  MEMBER CLEMENTS-MANN: -- that it  
19                  doesn't have any impact on the decision-making of  
20                  what drugs to use?

21                  CAPT. LITTRELL: Yes, ma'am, very good  
22                  question. The answer would require a  
23                  multifactorial approach. Certainly we have the  
24                  technological and data capture capability.

25                  We're dealing with this problem with  
26                  anthrax now and many other immunizations. And

1 there is going to be more in the future. So this  
2 is going to become routine military information  
3 going forward.

4 And, in fact, many people are talking  
5 about an encrypted smart dog tag, if you will,  
6 where you would encode the entire medical history  
7 into the soldier for him to carry with him. And  
8 then, of course, we certainly have the  
9 technological means to rapidly access and utilize  
10 that information.

11 PRESIDENT FLETCHER: Dr.  
12 Barrett-Connor?

13 MEMBER BARRETT-CONNOR: I was under  
14 the impression that the 45-milligram primaquine  
15 dose given not daily prevented hemolysis in  
16 African American type. Is that not correct?

17 CAPT. LITTRELL: Yes, ma'am.  
18 Forty-five milligrams taken weekly is equivalent  
19 in efficacy in terms of preventing tissue stage  
20 parasites from going on to become a case of  
21 malaria.

22 And so it was found in the studies  
23 done in the early '60s on healthy volunteers, I  
24 might add, that it was actually safer to give 45  
25 milligrams a week than 15 milligrams a day.

26 MEMBER BARRETT-CONNOR: So why not use

1 that instead of screening the African Americans?

2 CAPT. LITTRELL: Well, we did that in  
3 Vietnam. We gave 45 milligrams a week. And we  
4 had cases of hemolytic anemia. And we had cases  
5 of acute renal failure. And so --

6 MEMBER BARRETT-CONNOR: But was that  
7 45-milligram a week hemolysis/complications rate  
8 what you used in your calculations here?

9 CAPT. LITTRELL: Yes.

10 PRESIDENT FLETCHER: A couple more  
11 questions. Dr. Eggert?

12 LtCol. EGGERT: Yes. This is one  
13 question and then one comment. The trend in the  
14 literature to report cost analysis in screening  
15 program is cost per case prevented. Did you  
16 calculate that?

17 CAPT. LITTRELL: Yes.

18 LtCol. EGGERT: What was that figure?

19 CAPT. LITTRELL: That was the \$6,000  
20 and the \$3,000 figure that I --

21 LtCol. EGGERT: So \$6,000 to prevent  
22 the one case of hemolytic anemia?

23 CAPT. LITTRELL: That's right.

24 PRESIDENT FLETCHER: Last question.

25 Dr. Ryan?

26 LCDR. RYAN: Just a couple of comments

1 from the Navy side. Patients reporting G-6-PD;  
2 that is, recruits reporting G-6-PD, deficiency is  
3 a very small number, --

4 CAPT. LITTRELL: That's right.

5 LCDR. RYAN: -- very small. It's not  
6 accurate at all. It's like background level of  
7 45.

8 CAPT. LITTRELL: Right.

9 LCDR. RYAN: The question of what do  
10 you do with the data when you screen recruits,  
11 which is what the Navy does, -- and I hope my  
12 Navy colleagues will agree -- we use that data.

13 CAPT. LITTRELL: Right.

14 LCDR. RYAN: I mean, you implied that  
15 we do it but we don't use it. We stamp it in the  
16 medical record right where the drug allergies go.

17 CAPT. LITTRELL: Right.

18 LCDR. RYAN: And we either don't give  
19 primaquine or give the modified primaquine  
20 regimens to people who are deploying.

21 Another argument in favor of recruit  
22 screening that is hard to bring out is that and  
23 the reason the Navy does recruit screening is  
24 that when you -- you implied that you are drawing  
25 blood pre-deployment anyway. So there's some  
26 savings in that --

1 CAPT. LITTRELL: That's right.

2 LCDR. RYAN: -- cost of doing the  
3 blood draw. We try not to have any blood draw  
4 pre-deployment. So we're really trying to have  
5 every recruit stamped --

6 CAPT. LITTRELL: Ready to go.

7 LCDR. RYAN: -- in the medical record  
8 what happens before they get out of boot camp.  
9 But we don't have to draw anything  
10 pre-deployment.

11 For the Marines, where it's a lot more  
12 than -- you used a factor of ten percent being  
13 deployable. The Marines would be much higher.

14 CAPT. LITTRELL: That was for the  
15 Army. Yes. That was for the Army. For the  
16 Marines, I'm sure it would be much higher.

17 LCDR. RYAN: So that's why we do boot  
18 camp screening.

19 CAPT. LITTRELL: Right. And the  
20 reason I say that, we may to draw blood on  
21 individuals or give immunizations. So we would  
22 certainly be in the mind of thinking where we  
23 could certainly draw blood very quickly when  
24 those events occur, for the Army we have  
25 screening to prevent the walking blood bank.

26 And so we would be testing HIV and

1 making sure all of those things are up to date.  
2 And so there would be some potential to save some  
3 money as a result of that.

4 PRESIDENT FLETCHER: Thank you very  
5 much, Doctor. We need to move on to our next  
6 topic.

7 EXECUTIVE DIRECTOR FOGELMAN: I want  
8 to say first --

9 PRESIDENT FLETCHER: Colonel Fogelman?

10 EXECUTIVE DIRECTOR FOGELMAN: -- that  
11 the Board was asked a while ago to make a  
12 recommendation in this area. And the Infectious  
13 Disease Subcommittee will take this under  
14 advisement in their subcommittee meeting  
15 tomorrow. So pleased be prepared to do so.

16 CAPT. LITTRELL: Thank you for having  
17 me.

18 PRESIDENT FLETCHER: Thank you very  
19 much.

20 (Applause.)

21 EXECUTIVE DIRECTOR FOGELMAN: Our next  
22 speaker will be Dr. Charlotte Gaydos, who is  
23 Assistant Professor in the Department of Medicine  
24 at Johns Hopkins University.

25 She will be discussing a study that  
26 they recently conducted of U.S. Army recruits

1 looking at prevalence, risk factors, and some  
2 other things with regard to chlamydia trachomatis  
3 infection.

4 Dr. Gaydos?

5 PRESIDENT FLETCHER: Thank you.

6 DR. C. GAYDOS: Thank you.

7 GENITAL CHLAMYDIA IN U.S. ARMY RECRUITS

8 DR. C. GAYDOS: I'm delighted to be  
9 here. Colonel Fogelman, Dr. Fletcher, members of  
10 the Board, thank you for giving me this  
11 opportunity to tell you about our study.

12 Can I have the first slide, please?

13 EXECUTIVE DIRECTOR FOGELMAN: I would  
14 say for the Board's information that this  
15 information has not yet been published and we  
16 would like to keep this confidential as well.

17 DR. C. GAYDOS: I'd like to start my  
18 presentation with a little quiz. I hope that we  
19 can all answer this question.

20 This study is funded by a grant from  
21 the Women's Defense Initiative at Fort Detrick.  
22 And we are studying chlamydia trichomatous in  
23 Army women, looking at prevalence, risk factors,  
24 and trying to do a cost-effective analysis of  
25 early diagnosis and treatment.

26 I'd like to mention my collaborators,

1 both at Walter Reed, at Fort Jackson, Fort Bragg,  
2 and at Hopkins.

3 As Dr. Fogelman said, this data is not  
4 yet published. It has been submitted for  
5 publication, so I would appreciate the  
6 confidentiality of the data that I am going to  
7 discuss today.

8 Most of you probably know chlamydia is  
9 a very common sexually transmitted disease. It's  
10 usually asymptomatic in women, and very many men  
11 are also asymptomatic. The devastating sequelae  
12 are borne mostly by women in that we can have the  
13 development of pelvic inflammatory disease,  
14 endometritis, ectopic pregnancy, so forth.

15 It's been estimated in the United  
16 States, as I said, four million cases, making it  
17 the most prevalent sexually transmitted disease  
18 which is bacterial in nature.

19 Chlamydia last year made CDC's top of  
20 the list for the most frequently reported  
21 infectious diseases. This is a graph showing the  
22 rise in cases over the years. Although this  
23 looks like a large-scale epidemic, this sharply  
24 increasing curve probably represents increased  
25 testing and increased reporting. A few years  
26 ago, it was not required for every state to

1 report chlamydia. It's now required to be  
2 reported by every state and territory.

3 As I said, chlamydia has been called  
4 the silent epidemic because women who have this  
5 infection don't usually seek health care and many  
6 men also.

7 If you think about treating STDs in  
8 the community, in our traditional medical  
9 setting, we only treat symptomatic people who  
10 come in contact with the health care service.  
11 And by having the institution of a diagnostic  
12 procedure and a correct diagnosis and the correct  
13 treatment, we can cure an STD.

14 But on this side of the scale, if  
15 nobody ever comes in contact with a health care  
16 service, we're never going to treat them unless  
17 they come in for something else and we screen  
18 them. So chlamydia as a sexually transmitted  
19 disease needs to be proactive community outreach  
20 to find these people.

21 Not only can we have endometritis with  
22 pelvic inflammatory disease, but later on  
23 complications can result in Fallopian tube  
24 damage, with the subsequent development of  
25 infertility, chronic pelvic pain, and ectopic  
26 pregnancy.

1           There are lots of PID cases every year  
2           in the United States. These data are pretty old,  
3           by Washington, *et al.*, in 1991. We have lots of  
4           outpatient visits, hospitalizations, and surgical  
5           procedures due to pelvic inflammatory disease.

6           Not only are women affected, but, as I  
7           said, men can develop urethritis, epididymitis,  
8           and infants born to infected mothers can develop  
9           conjunctivitis and pneumonia. These are  
10          estimations in the United States in the civilian  
11          sector.

12          Washington and colleagues have  
13          estimated that we spend about \$4.2 billion a year  
14          and that by the year 2000 we'll spend \$10 billion  
15          a year to take care of chlamydial infections and  
16          their sequelae; whereas, a national screening  
17          program would cost a lot less. And, indeed, a  
18          couple of years ago CDC has embarked upon funding  
19          a national chlamydia screening program in the  
20          civilian sector for public health clinics.

21          How do we know that treating chlamydia  
22          prevents pelvic inflammatory disease? No one  
23          really knew this for sure until this landmark  
24          article was published, I believe in June of last  
25          year, by Delia Sholes from Walt Stan's group at  
26          the University of Washington, where they screened

1 2,500 high-risk asymptomatic women.

2 Half were asked to be screened and if  
3 positive were treated. And the control group was  
4 just allowed to proceed in their health  
5 maintenance organization normally.

6 At the end of one year, the PID rate  
7 for 10,000 women-months was 8 in the screened  
8 group -- and not everyone was screened -- and 18  
9 in the control group, resulting in a 60 percent  
10 reduction of pelvic inflammatory disease by  
11 screening proactively in one year.

12 In the military -- and, actually, I  
13 should say this is Army -- we have some data from  
14 San Antonio, from the individual patient  
15 discharge summary sheets, that in the years '91  
16 to '93 we had a range from 1.6 to 1.1 percent of  
17 Army women develop a case of pelvic inflammatory  
18 disease; -- these are for women 18 to 44 years of  
19 age -- similarly, high rates for ectopic  
20 pregnancy. The years 1994, '95, '96, our rates  
21 are dropping a little bit but not substantially.

22 Still, one percent of all Army women will  
23 develop a case of pelvic inflammatory disease in  
24 a year.

25 This may not seem like a big problem  
26 except that ten percent of all the active-duty

1 people in the Army are women. And for the last  
2 time I looked, 20 percent of all new recruits are  
3 female.

4 The ectopic pregnancy rates for these  
5 years were much lower. And I have no reason for  
6 this tremendous drop from the previous slide to  
7 this slide.

8 Question?

9 MEMBER POLAND: Are you attributing  
10 all PID and ectopic pregnancy to chlamydia?

11 DR. C. GAYDOS: No. It's been  
12 estimated that about up to 50 percent of PID and  
13 ectopic pregnancy are due to chlamydia. We know  
14 also that other causes of pelvic inflammatory  
15 disease are neisseria, gonorrhoea, and anaerobes.

16 And certainly we're not attributing every case  
17 to chlamydia.

18 However, as more and more data is  
19 coming out with more sensitive testing, there is  
20 a general consensus that probably more than what  
21 we give credit to is due to chlamydia and the  
22 damage that it causes to the tubes.

23 The hypotheses for our study, which we  
24 translated into our objectives, were that we  
25 would have a high rate in female recruits of  
26 chlamydia; that we could use a new test, ligase

1 chain reaction, which is a DNA amplification  
2 test; and that we could use urine as a sensitive  
3 and specific way to screen; that we could come up  
4 with some sort of a control program, either  
5 selective or universal screening, perhaps even  
6 mass therapy, that would lower the chlamydia  
7 prevalence and sequentially lower the incidence  
8 of PID and ectopic pregnancy. And we also  
9 hypothesized that this control program would be  
10 cost-effective.

11 What is the significance for military  
12 control of chlamydia? Short term, of course, is  
13 readiness and costs. And long term we can  
14 protect the health or reproductive health of  
15 women by reducing infertility. We have the  
16 ability over the years to save a lot of money.  
17 And certainly we can hopefully reduce the  
18 prevalence and these rates.

19 So, to our study. There's never been  
20 a large, comprehensive study for chlamydia done  
21 in military women. There have been a few small  
22 studies. We instituted studies at Fort Jackson  
23 with the recruits and then two other studies,  
24 which I'm not going to say much about.

25 We looked at a symptomatic population  
26 at Fort Jackson in the troop medical clinic and

1 an asymptomatic population in the Pap smear  
2 clinics at Fort Bragg. We tested by urine ligase  
3 chain reaction. We administered a questionnaire  
4 to collect demographics and risk factor  
5 information.

6           These studies were approved by  
7 institutional review boards at Johns Hopkins and  
8 at the respective Army posts. We also had  
9 informed consent in that all the women signed  
10 consent. We had a volunteer rate of about 80  
11 percent.

12           So the advantages of molecular  
13 amplification tests include that we can use it  
14 with urine. And it's cost-effective over a wide  
15 prevalence of infection. We have recently  
16 published a couple of papers on  
17 cost-effectiveness using these assays. And  
18 they're on the back table for those of you who  
19 are interested. In addition, we can combine  
20 screening with other pathogens, such as gonorrhea  
21 and trichomonas.

22           Ligase chain reaction uses the plasmid  
23 gene as its target for DNA. It uses probes,  
24 which end up being ligated together if the target  
25 is present. And then ligands on the probes are  
26 used for detection. And basically each cycle

1 doubles the amount of DNA that is in a specimen.

2 This is a cartoon showing basically  
3 that we go from one copy to four copies in one  
4 cycle of amplification. There are 40 cycles in  
5 the test. And so we are amplifying the amount of  
6 DNA in a specimen one billion-fold.

7 Many people say that amplification  
8 tests make looking for an infectious agent like,  
9 instead of looking for a needle in a haystack,  
10 you're making a needle into a haystack.

11 Then the DNA is detected in this  
12 automated enzyme immunoassay on an IMX machine.  
13 And if we have had ligation of the probes, then  
14 the conjugate in its enzyme causes a color  
15 reaction, which is measurable in an automated  
16 machine.

17 Now, this sounds like it's a  
18 complicated test. It's made by the Abbott  
19 Company, and it's very easy to do. We have  
20 taught high school students to do it.

21 You prepare the urine sample by  
22 centrifugation and boiling the sediment with the  
23 buffer. You put it in a unit dose where it's  
24 thermocycled. And you get the amplification.  
25 And then you detect the DNA. It's very easy.

26 These pie diagrams show the results of

1 the clinical urine specimens that were used for  
2 the FDA clinical trials to get this test  
3 approved. Ligase chain reaction picked up 95  
4 percent of all the positives; whereas, culture,  
5 used to be thought our gold standard, only picked  
6 up about 60 percent of the positives.

7 MEMBER STEVENS: What is the  
8 definition of positives, in that test?

9 DR. C. GAYDOS: The numbers of  
10 positives were the ones that were found positive  
11 either by culture or that were found positive by  
12 ligase chain reaction.

13 If the culture was negative, the  
14 positive result by LCR was adjudicated by another  
15 test, either DFA of the sediment from the  
16 culture, which was stained for elementary bodies  
17 or PCR or LCR for a different gene. So these are  
18 adjudicated to find the true positives.

19 MEMBER STEVENS: And how about false  
20 positivity rate with the CR?

21 DR. C. GAYDOS: Specificity is about  
22 99.9 percent. We just do not see any false  
23 positives. This is the performance for the  
24 clinical trials for all 4,660 specimens which  
25 were submitted for the FDA. And overall we have  
26 a sensitivity of 95 percent for a variety of

1 sensitivity with a high specificity.

2 Now, the results of our study, these  
3 are the three groups. Everything else I'm going  
4 to say today is in reference to the 9,000 women  
5 recruits that are screened, but just for  
6 background information, the troop medical clinic  
7 at Fort Jackson, we screened 672 people with a  
8 prevalence rate of 11.9 percent.

9 At clinics for Pap smears at Fort  
10 Bragg, we screened 480 women, prevalence over 7  
11 percent. There was only one of these women who  
12 said they had any kind of symptoms.

13 EXECUTIVE DIRECTOR FOGELMAN: You said  
14 the troop medical clinic population was  
15 symptomatic?

16 DR. C. GAYDOS: Yes. These are health  
17 care-seeking women coming in for a variety of  
18 symptoms to seek care from a clinician. So I'm  
19 not going to say anything else about those except  
20 to say that the study at Fort Bragg will be  
21 published in the May issue of the *Journal of*  
22 *Clinical Microbiology*.

23 When we look at the 9,000 female  
24 recruits and we look at the behavioral risk  
25 factors, -- this is the whole population here --  
26 93.6 percent are sexually active. Many of them

1 have high-risk behavior for acquiring an STD.  
2 Either they have more than one sex partner or a  
3 new sex partner. And only about 15 percent of  
4 them use condoms. The prevalence rate in these  
5 women was higher if they had the risk behaviors,  
6 13-12 percent if they had these risk behaviors.

7 This is a graph showing the age  
8 distribution of these 9,000 recruits. You can  
9 see that our highest rates are in the young. And  
10 then they drop precipitously as increasing age.

11 Another --

12 MEMBER BARRETT-CONNOR: Is that  
13 because the infection rates are different or  
14 because the titers just fall off?

15 DR. C. GAYDOS: Nobody really knows.  
16 It is suspected that there might be a case of  
17 some immunity. There is also suspected that  
18 perhaps the organism is ascending the genital  
19 tract and going into the tubes and you are not  
20 able to recover the organism.

21 Chlamydia is a type of organism that  
22 can be maintained in a persistent state. And  
23 you're not able to recover the replicative state.

24 So no one really knows. It basically goes away  
25 after age 25, but the damage that --

26 MEMBER BARRETT-CONNOR: Does anyone

1 know how these -- in the group that you are  
2 studying, do you have the chance to see how long  
3 they remain positive? Were they retested for --

4 DR. C. GAYDOS: We treat them. We are  
5 treating positives.

6 MEMBER BARRETT-CONNOR: I thought you  
7 had an untreated group.

8 DR. C. GAYDOS: No, we don't. I have  
9 to say in the handout, there was probably  
10 something that we did an asymptomatic screen of  
11 women at the beginning of the study.

12 During the time that we were  
13 submitting the grant, the test became licensed by  
14 the FDA. And, therefore, we could not ethically  
15 screen them symptomatically. So we treated them  
16 all and took their names.

17 If you break down our youngest age  
18 groups into greater or less than 25, you can see  
19 that 87 percent of this population was less than  
20 25 years. And if we make a break point at 25  
21 years, we can see that the positivity rate is 9.9  
22 percent in those under 25 but only 3 percent in  
23 those over.

24 Next slide, please. The demographics.  
25 Looking by race, 51 percent of our population  
26 was Caucasian; 35 percent, African American; 13

1 percent, other races. You can see that the rate  
2 was 14 percent in the African Americans and 6  
3 percent in the Caucasians.

4 Next slide. Another way of looking at  
5 this, a bar graph you can see here, 9.9 percent  
6 in those under 25, 3 percent greater than 25.  
7 These are new recruits now: African American,  
8 14; 6; and the like.

9 This is just to remind me to tell you  
10 that I brought a couple of the cost-effective  
11 analyses that we have done in some of our  
12 population groups and using amplification in our  
13 group at Johns Hopkins.

14 Then we moved on to do a  
15 cost-effective analysis. And I'd like to thank  
16 Captain Littrell for instructing you so that  
17 you're in the cost-effective mood here because  
18 the rest of what I'm going to say is the  
19 cost-effectiveness part of this.

20 We looked at a couple of different  
21 strategies to try to determine whether screening  
22 by age or screening everyone might be the best  
23 way to look at having a control program for  
24 chlamydia.

25 Yes?

26 MEMBER CLEMENTS-MANN: Do you know:

1 Can women be reinfected over and over with  
2 chlamydia --

3 DR. C. GAYDOS: Yes, they can.

4 MEMBER CLEMENTS-MANN: -- or is there  
5 any evidence that if you get that first infection  
6 treated, that they won't be reinfected?

7 DR. C. GAYDOS: No. And there is no  
8 reason to believe that they can't get reinfected  
9 from their male partners. Part of the rationale  
10 for a chlamydia control program when recruits  
11 come into the military is that you're a low area  
12 in the core burden of disease. And certainly  
13 there is some animal model information to show  
14 that there is some limited immunity if you are  
15 infected with the same serotype the second time,  
16 but it's limited. And there have not been any of  
17 those studies done in humans.

18 So we looked at the cost in 1995  
19 dollars with a three percent discounting rate for  
20 bringing future prices back to 1995. We  
21 conducted this study from a military, which is a  
22 societal point of view, perspective. And we used  
23 a decision tree analysis exactly like the one  
24 that Captain Littrell presented to you a few  
25 minutes ago.

26 We extrapolated our data to a

1 population of 10,000 women. The outcomes that we  
2 looked at were: inpatient, outpatient, PID,  
3 chronic pelvic pain, ectopic pregnancy, and loss  
4 of money or probability of being discharged with  
5 the condition existing prior to service.

6 Right now if a woman is diagnosed with  
7 pelvic inflammatory disease within the first six  
8 months of joining the military, she is discharged  
9 with this condition. So these costs were  
10 important to look at in that the military  
11 invested costs in training these recruits.

12 So our costs were: the intervention,  
13 including the assay; the drug; the visit for side  
14 effects if there were any; the medical costs that  
15 were prevented; and the costs for basic training  
16 for EP/TS.

17 So these are the strategies. We  
18 looked at: no screening, screening for all women  
19 under age 25 in treating the positives with  
20 azithromycin, which eliminates an idea of  
21 compliance because it's a one-gram stat dose.  
22 The other strategy was screening all women or  
23 treating all women with mass therapy.

24 These are the probability risks of  
25 events. Where possible, we use military-specific  
26 rates. You can see here the sensitivity. We

1 used 88 percent because this was the sensitivity  
2 of our study at Fort Bragg in the asymptomatic  
3 population in a real military population.

4 We used an effectiveness of 96 percent  
5 for azithromycin, which is from the expert  
6 opinion and well-documented in the literature.  
7 We estimated that 6.4 would develop side effects,  
8 that we would lose 13 percent by attrition.

9 We used a very conservative estimate  
10 of PID of 30 percent. Many experts believe that  
11 the rate is more like 40 or 50 percent. Of those  
12 who would develop PID, of these 30 percent, 60  
13 percent would be silent or completely  
14 asymptomatic, 40 percent would be symptomatic.

15 Of the ones who were symptomatic, 11  
16 percent would end up in the hospital, 89 percent  
17 would be treated outpatient. And we estimated  
18 that 16 percent of the population who had PID  
19 would be discharged. We used chronic pelvic pain  
20 within 5 years of 18 percent and the possibility  
21 of developing ectopic pregnancy of 8 percent.

22 These are the costs in 1995 dollars.  
23 These are Army-specific costs averaged across the  
24 United States, not just expensive hospitals like  
25 Walter Reed, but all hospitals where these  
26 patients might be treated.

1 Question?

2 MR. DROONEY: Steve Drooney from ADC.

3 Just a point of clarification. I  
4 guess the Army routinely discharges women with  
5 PID if that occurs within the first six months?

6 DR. C. GAYDOS: That's correct.

7 MR. DROONEY: I don't think we do that  
8 in the Air Force. I wasn't aware of that being  
9 the policy.

10 DR. C. GAYDOS: That is policy for the  
11 Army.

12 MR. DROONEY: What does the Navy do?

13 LCDR. RYAN: It's written in. It's a  
14 joint instruction on what's disqualifying, and  
15 it's in there as disqualifying. But what we do  
16 at Great Lakes is even if somebody has got a  
17 disqualifying diagnosis if it fits it, we don't  
18 disqualify them.

19 So I have never seen somebody  
20 discharged for a PID in my time at Great Lakes.

21 DR. C. GAYDOS: We had a couple of  
22 recruits at Fort Jackson this year.

23 Okay. These are the results. These  
24 are the four strategies over here: from no  
25 screening to just treating everybody. We would  
26 expect in a hypothetical population of 10,000

1 women that if we did not screen, we would develop  
2 over the course of a couple of years 270 cases of  
3 PID.

4 If we screened and treated those under  
5 25, we would develop 52; screened everyone, we  
6 would prevent a few more; and treating all, we  
7 would prevent a few more. So these are the  
8 incremental cases prevented over the next least  
9 effective strategy.

10 This is the cost. If we did no  
11 screening and just treated the sequelae, it would  
12 cost about a half a million dollars. If we  
13 screened and treated those under 25, we would  
14 have 145,000 for the program costs. And then the  
15 sequelae costs would be 106, for a total cost of  
16 251.

17 So when we talk about total cost, we  
18 have to have the cost of administering the  
19 program and then a cost of what we would have to  
20 pay for the sequelae that developed from not  
21 curing these infections.

22 The most cost-effective strategy, to  
23 our great surprise, came out of the model that it  
24 was most cost-effective to treat all women when  
25 they came into the Army with the one-gram dose.  
26 And this is even considering side effects.

1           So this slide is a summary of the two  
2 previous slides. You can see here screening  
3 those under 25 and treating them, we would save  
4 this much money and prevent this many cases over  
5 not screening. We would prevent more cases if we  
6 screened everybody, we would save \$5,000 more.

7           And we would save \$39,000 more if we  
8 just treated everyone because the test isn't  
9 perfect. And we would expect to prevent a lot of  
10 PID because we would be curing a lot more cases  
11 of chlamydia if we just treated everyone. And  
12 this is just the ratio, incremental  
13 cost-effective, ratio of the strategy relative to  
14 the ones in front of it.

15           Per individual, it would cost \$14 an  
16 individual: for the assay, to do the follow-up,  
17 to give the drug, to look if there were any side  
18 effects. So we would expect to spend about \$14  
19 per individual if we screened the young women, 15  
20 if we screened everyone, and 18 if we treated  
21 all. But we're going to be saving more money in  
22 sequelae by treating all.

23           Now, this is one such example of the  
24 sensitivity analyses, where we varied all of our  
25 best guesses for probabilities. We did  
26 sensitivity analysis on everything from the cost

1 of the test to the prevalence of the disease to  
2 the prevalence of side effects and so forth so  
3 that we could see and calculate a threshold value  
4 for each of these assumptions.

5           You can see here that this is one  
6 example that if we were incorrect in our measure  
7 of the prevalence, if we modeled the chlamydia  
8 prevalence from 2 percent to 12 percent, that  
9 it's still cost-effective to treat everyone at a  
10 prevalence greater than 6.2 percent.

11           So if our population, we ever got to a  
12 population prevalence sometime below six percent,  
13 it would be most cost-effective to screen based  
14 on age. And it wouldn't be until we got to a  
15 threshold value of 1.9 percent where it wouldn't  
16 be cost-effective to screen at all.

17           So our conclusions. We know that  
18 these Army recruits are at high risk. They have  
19 a lot of chlamydial infections. Our preliminary  
20 model shows us at a prevalence of over six  
21 percent, that a single dose of azithromycin dose  
22 for all women would have the greatest potential  
23 to be a cost savings and prevent the most  
24 morbidity.

25           Limitations of our model include the  
26 uncertainty of our estimates. We feel most

1 uncertain about the estimates of who would seek  
2 care, which costs money, for side effects and  
3 then a good measure of the probability of these  
4 women being discharged prior to finishing basic  
5 training or prior to spending six months in the  
6 Army. We need to do further study to assess the  
7 extent of these side effects and also to track  
8 these events and for each strategy in terms of  
9 costs.

10 We asked for institutional review to  
11 do a mass therapy option for the last two years  
12 of our study. Johns Hopkins did approve this  
13 request for a mass therapy trial, much like the  
14 one that Commander Greg Gray did in Marine  
15 recruits, looking at the cost-effectiveness of  
16 giving or just the effectiveness of giving  
17 azithromycin to Marine recruits to prevent  
18 respiratory diseases.

19 However, yesterday I found out that  
20 the institutional review board at Fort Gordon has  
21 said no, we are not allowed to do this study at  
22 Fort Jackson. So we'll probably just publish the  
23 results of the model and not get to study the  
24 material.

25 PRESIDENT FLETCHER: Thank you,  
26 Doctor.



1 then Jim Allen.

2 DR. C. GAYDOS: That's true. That's  
3 true.

4 MEMBER STEVENS: A couple of  
5 questions. One is: Why did the IRB turn you  
6 down? And the second question is: What's the  
7 incidence of infection in these young women, the  
8 incidence while they're in the military?

9 DR. C. GAYDOS: This has not ever been  
10 studied. As recruits, we believe it's not very  
11 high. These recruits were tested within three  
12 days joining the military.

13 But if you look at the Fort Bragg  
14 data, where you're looking at an older population  
15 who has been in the military for a while, their  
16 prevalence is still seven percent. So if they  
17 don't know they have it, they never get treated  
18 or if they do, they can get reinfected.

19 PRESIDENT FLETCHER: Dr. Allen is  
20 next.

21 MEMBER STEVENS: Go back to the IRB  
22 question, though. What was the reason they  
23 turned you down?

24 DR. C. GAYDOS: I haven't seen the  
25 written summary sheets yet. I just saw the  
26 verbal report. But they were concerned about

1 treating 90 percent of the women who apparently  
2 weren't infected, even though there is good  
3 evidence to think that we would cure about 75  
4 percent of the gonococci and we would also cure a  
5 lot of beta strep, microplasm pneumoniae, and  
6 chlamydia pneumoniae.

7 So probably by treating everyone, like  
8 we sometimes treat with penicillin for one of the  
9 strep events, that you would have the other added  
10 benefits of lowering some of the respiratory  
11 infections also.

12 And we were going to monitor that, but  
13 they said no.

14 PRESIDENT FLETCHER: Dr. Allen?

15 MEMBER ALLEN: Dr. Clements and Dr.  
16 Stevens anticipated some of the same questions I  
17 had. So let me focus on another aspect, which is  
18 in treating everyone, you're not addressing any  
19 of the potential concerns about over-treatment  
20 with antibiotics and the potential problems from  
21 that.

22 It seems to me that that's got to be  
23 weighed into the model in some way.

24 DR. C. GAYDOS: Yes. You're  
25 absolutely right. Expert opinion at this time  
26 has not ever shown any azithromycin resistance,

1 but you're quite right in that by using a lot of  
2 antibodies, you have an opportunity to develop  
3 resistance to other organisms. And this is one  
4 of the limitations of the model is there is no  
5 good way to measure this.

6 But you're quite right that this is a  
7 concern. And this is probably the reason why the  
8 institutional review board does not want to see  
9 us test.

10 PRESIDENT FLETCHER: Dr. Poland?

11 MEMBER POLAND: The other concern that  
12 I had -- I agree with Jim. I think that while  
13 it's an intangible, it's a high cost. But the  
14 other concern I have is while it's unlikely they  
15 will get reinfected during recruit training, it's  
16 kind of like saying we're going to give an  
17 antibiotic to stop whatever disease knowing that  
18 once they leave that period of training, the very  
19 reason that they're infected to begin with is a  
20 high risk for being reinfected.

21 Are you proposing that they would get  
22 periodic mass treatment?

23 DR. C. GAYDOS: Well, this would be  
24 one of my long-range goals that the military  
25 would come up with some sort of an effective  
26 control program that would eliminate or at least

1 reduce this possibility in the future, that if  
2 women were screened and men were screened when  
3 they come into the military and treated  
4 appropriately, that you would lower the core  
5 burden of disease so that there would not be as  
6 much effective control programs.

7 It could also be that they get  
8 screened whenever they check into a new post when  
9 they get transferred, at a new medical treatment  
10 facility during in-processing, that they get  
11 screened.

12 The urine screen makes it so easy to  
13 screen people. And, even though right now the  
14 cost of the assay is high, some push in the  
15 marketplace from manufacturers of similar tests  
16 is going to drive the cost down in the future.

17 PRESIDENT FLETCHER: Dr. Haywood?

18 MEMBER HAYWOOD: Do you have an  
19 estimate of the number of contacts that are  
20 military versus nonmilitary?

21 DR. C. GAYDOS: None other than the  
22 fact that about 30 percent of them report having  
23 a new partner in the last 90 days. This is about  
24 what we see in the populations, at least in  
25 Baltimore, where I'm most familiar with the data.

26 It's about 30 percent of people in the

1 family planning or an STD clinic or even in our  
2 high schools. We're seeing prevalence in our  
3 middle schools, multiple or 17 percent in 15 to  
4 17 percent of high schools. But the rate of new  
5 partner exchanges is about what we see in the  
6 civilian sector.

7 PRESIDENT FLETCHER: About two more  
8 questions. Dr. LaRosa was next, I believe.

9 MEMBER LaROSA: One of my concerns is  
10 what kind of health education is going on at the  
11 same time. I saw that it was about 15 percent  
12 condom use. And I know that it's a very  
13 difficult thing to get across to people. It  
14 seems like that teachable moment that we're  
15 talking about.

16 DR. C. GAYDOS: We do have a civilian,  
17 former Army, community health nurse who collects  
18 our specimens. She gives about an hour  
19 educational briefing before people are asked if  
20 they want to volunteer for the study.

21 We give them a three-page tri-fold  
22 out, eighth grade reading level or maybe sixth  
23 grade reading level, educational brochure about  
24 what is chlamydia, how you can give it to your  
25 partners, what you can do, and so forth.

26 So, at least in our program, we also

1 saw this as a very teachable moment. And she's a  
2 very good briefer. And we think that's why we  
3 get such a high volunteer rate.

4 PRESIDENT FLETCHER: One more  
5 question, please. Yes?

6 PARTICIPANT: I would be against using  
7 azithromycin in the broad population like that  
8 because I would worry about increasing rates of  
9 penicillin-resistant pneumococcal carriage in the  
10 recruit burden that you have there.

11 There is some thought that by using a  
12 broad-acting acrylate like that in a wide  
13 population, you would carry pollenization  
14 resistance and interference and allow  
15 pollenization of erythromycin-resistant  
16 pneumococci.

17 In many urban centers now, there is a  
18 fairly high rate. Maybe 20 or 30 percent of the  
19 penicillin resistance is pneumococcus. It is  
20 closely linked with erythromycin resistance.

21 My expectation would be that what you  
22 would find if you did carriage rates would be a  
23 fairly marked increased rate of  
24 penicillin-resistance pneumococcal carriage in  
25 the population.

26 DR. C. GAYDOS: You could be right.

1 And that is something that would have to be  
2 addressed before institutions would do such a  
3 policy.

4 PRESIDENT FLETCHER: Dr. Gaydos, thank  
5 you very much. We'll move on to our next  
6 presentation.

7 (Applause.)

8 EXECUTIVE DIRECTOR FOGELMAN: Our next  
9 speaker is well-known to you. Major Carol  
10 Fisher, who helps me part-time at the AFEB and  
11 has also taken up a new position as the  
12 Associate, Medical Treatment Facility Coordinator  
13 for the DOD Global Emerging Infection System  
14 Central Hub. And she is going to talk to us  
15 about the proposed DOD influenza surveillance  
16 plan a few minutes.

17 Major Fisher?

18 DOD RESPIRATORY DISEASE SURVEILLANCE PLAN

19 MAJ. FISHER: Good morning. Let me  
20 just say right up front I'll try to make up a  
21 little time here. This is really just an  
22 informational briefing on the DOD influenza  
23 surveillance plan.

24 And what we would like to do is come  
25 back -- I guess the next meeting will be August  
26 -- and brief the final plan and get the AFEB

1 blessing or AFEB validation before we actually  
2 start the plan in the fall.

3 I believe it was the last August  
4 meeting when Lieutenant Colonel Pat Kelly came  
5 and talked to the Board about the DOD guise, as  
6 we like to call it. And he talked a little bit  
7 about the concept of the program.

8 The program has two arms to it. It  
9 has what we like to refer to as the medical  
10 treatment facility arm. And then we have the  
11 overseas laboratory arm. And then also part of  
12 the program are the three service hubs.

13 I am actually on the medical treatment  
14 facility side of things. And in my own  
15 simplistic view of what I think the central hub  
16 is, I see us as a communication and coordination  
17 hub, where we try to identify gaps and bring  
18 responsible parties together to fill those gaps.

19 So basically this plan, which is just  
20 about ready to go out for review and comment as a  
21 second draft, is one of these gaps that we have  
22 identified and we are trying to fill.

23 Next slide. I am going to talk a  
24 little bit about why influenza is important to  
25 the military, a little background information,  
26 our mission that we established, our objectives

1 for the program, a little about the program's  
2 structure, and a little about resources.

3 Next slide. There are several reasons  
4 why influenza is important to the military. I  
5 think the first here is pretty obvious. If  
6 you've got increased morbidity and mortality; in  
7 other words, if you've got sick and dying  
8 soldiers, sailors, airmen, and marines, you  
9 definitely do not have a ready force.

10 Secondly, we have personnel stationed  
11 all over the world. And we particularly have  
12 personnel stationed in areas where new strains  
13 are likely to appear. We also have a highly  
14 mobile population that is capable of rapidly  
15 spreading influenza and other respiratory  
16 pathogens very quickly. And our basic training  
17 environments are definitely well-suited for the  
18 spread of all respiratory pathogens.

19 Next slide. Just as a reminder. I  
20 know we all know about the 1918 pandemic, but  
21 this is just a reminder of how deadly influenza  
22 can actually be.

23 During that pandemic of 1918, there  
24 were 20 million deaths worldwide, somewhere  
25 estimated around 500,000 of those deaths were in  
26 the United States. And of those 500,000, about

1 40,000 of those were U.S. military troops.

2           There have been several outbreaks  
3 since the 1918 outbreak that have had much less  
4 of an impact on our population. And then last  
5 year, although there was no great impact in our  
6 population, there appeared the H-5-N-1 strain in  
7 Hong Kong. This actually started the Services  
8 kind of reevaluating their preparedness for  
9 dealing with what could be a highly virulent  
10 emerging influenza strain.

11           Then that led to this DOD influenza  
12 surveillance working group we established. And  
13 we met for the first time down in San Antonio in  
14 February of this year. This is a tri-Service  
15 working group, and we had expertise from each of  
16 the surveillance efforts that we have listed  
17 here.

18           I know that the Board has heard of the  
19 active surveillance for adenovirus that Dr. Greg  
20 Gray and his group out at Naval Health Research  
21 Center are doing. The Army has been conducting  
22 acute respiratory disease surveillance for  
23 somewhere I think around 30 years.

24           Let me just mention a little bit about  
25 the Air Force's Project Gargle, which has been in  
26 existence since 1976. So it has been in

1 existence for over 20 years. It currently is the  
2 only global laboratory-based influenza  
3 surveillance program within DOD.

4 Project Gargle actively contributes to  
5 the WHO, or World Health Organization, Influenza  
6 Surveillance Network. They like to talk about  
7 success stories of their program. And one of  
8 those was I believe back in 1995, when it was  
9 actually Air Force isolates that were responsible  
10 for the addition of the Wuhan strain to the next  
11 year's vaccine.

12 One thing that I would like to mention  
13 here that I think is important is that the World  
14 Health Organization Influenza Surveillance  
15 Network, which, of course, CDC is a very big part  
16 of, is not directed toward maintaining military  
17 readiness, as you can well-expect. And they  
18 really only want military participation when it  
19 contributes to their goals and objectives. All  
20 right?

21 So right now I believe they will  
22 accept any specimens from Project Gargle that  
23 come from overseas, but when it comes to trying  
24 to subtype anything that we're seeing here in the  
25 States in our military population, I believe I'm  
26 correct in saying they're not doing any of that

1 for us now.

2 And I think that it's also important  
3 to say that the WHO plan will provide critical  
4 data that will be needed for preventive action as  
5 quickly as a DOD-specific plan would do.

6 Next slide. These are the 1997-98  
7 Project Gargle sites, just to give you an idea of  
8 where they are around the world. I believe there  
9 are 25 sites this year. And of those 25, 19 of  
10 them are Air Force bases. And, even before we  
11 started the DOD working group, the Air Force was  
12 in the process of expanding their Project Gargle,  
13 at least as far as adding sites from the other  
14 Services.

15 Next slide. At our initial meeting,  
16 one of the first things we did was develop a  
17 mission statement. And we said what: We want to  
18 do is to provide a global laboratory base,  
19 implement the surveillance system, and we want  
20 that system to be comprehensive, flexible,  
21 responsive. And, most importantly, we want it to  
22 be operationally relevant. And eventually we  
23 want this system to expand to include other  
24 respiratory diseases in U.S. military forces.

25 Next slide. Next we asked ourselves:  
26 What are we really trying to accomplish with

1 this program, with this global laboratory-based  
2 influenza surveillance system? And what are our  
3 specific objectives for the program?

4           What we came up with so far are these  
5 four specific objectives, where we want to  
6 isolate and identify circulating viruses, we want  
7 to be able to detect new variants or subtype, we  
8 also want to be able to identify outbreaks as  
9 early as possible, and then we want to be able to  
10 estimate on a weekly basis influenza-like  
11 incidence among the high-risk sentinel military  
12 populations that we identify.

13           Next slide. Now, moving on to program  
14 structure, there are going to be two types of  
15 surveillance involved in this program. The first  
16 is etiology-based, which is really what the Air  
17 Force's Project Gargle has been all about for  
18 over 20 years with the identification of  
19 influenza strains. And basically the etiology-  
20 based part of this, we're using the Air Force  
21 Project Gargle as a framework for that.

22           It will include all beneficiaries.  
23 And for each site, for each specific site that's  
24 selected, they will submit six throat swab  
25 specimens that meet the case definition that we  
26 have set per week for this program. I don't

1 think we have actually decided on the actual  
2 dates that the program will run, but historically  
3 Project Gargle has run from 1 October to, I think  
4 it is, 31 May.

5 Two laboratories have been identified  
6 to process these specimens: the Epi Lab down at  
7 Brooks Air Force Base in San Antonio, Texas and  
8 the Eisenhower Army Medical Center Laboratory at  
9 Fort Gordon, Georgia.

10 The population-based portion of this  
11 program is actually going to be, the framework  
12 for that is going to be, the active surveillance  
13 for adenovirus that NHRC is doing right now.

14 NHRC, their lab will actually process  
15 all of the specimens that come from the  
16 population-based sites. And this portion will  
17 only deal with active-duty members. And for  
18 specimen submission, each site will submit 2  
19 specimens per 1,000 active duty per week during  
20 the cycle of this program.

21 MEMBER ALLEN: Acutely ill?

22 MAJ. FISHER: Yes. The case  
23 definition is a person with a fever of 100.5  
24 degrees Fahrenheit or greater and at least one of  
25 the following symptoms: sore throat, cough, or  
26 headache, or a person who has clinical or

1 radiograph evidence of acute non-bacterial  
2 pneumonia.

3 MEMBER CLEMENTS-MANN: What is ILI?

4 MAJ. FISHER: Influenza-like illness.

5 Next slide. Okay. We have identified  
6 several site selection criteria. And these  
7 little boxes here are supposed to be up arrows.  
8 I guess that has something to do with the version  
9 of Power Point that I used.

10 Basically, to be considered as a site,  
11 there had to be a high potential for emergence of  
12 a new strain. There had to be a high potential  
13 for importation of influenza into the United  
14 States.

15 It could be a place where we have  
16 increased troop concentrations, populations that  
17 are historically at risk, like recruit  
18 populations, and any highly mobile populations,  
19 like air crews and special operations-type  
20 personnel.

21 Let me just say that the sites for  
22 1998-99 are still under review. I believe to  
23 date we have 29 sites identified for the  
24 etiology-based surveillance and somewhere around  
25 12 sites identified for the population-based.  
26 We're still trying to cut those down, but based

1 on that, it would be somewhere around 1,500  
2 specimens that would be submitted to these three  
3 labs per month.

4 Next slide. These are supposed to be  
5 little dots here. Basically these are  
6 representations of both the etiology-based and  
7 the population-based surveillance sites.

8 Next slide. Okay. Resources. Like I  
9 said, we have identified three laboratories that  
10 we're going to use for this program. And let me  
11 also say that we're really going to try to use  
12 this program to establish a military public  
13 health laboratory capability that we sorely need.

14 I think listening to Dr. Gaydos talk,  
15 that capability used to exist in the military  
16 years ago, but as the years have progressed, we  
17 have pretty much lost that capability. And, as  
18 far as I know, really, the Epi Lab that the Air  
19 Force has down at Brooks Air Force Base is one of  
20 the few if you want to call it a public health  
21 laboratory capability that we have.

22 We estimated that our current capacity  
23 with these three labs right now is about 1,100  
24 specimens per month. And to achieve a surge  
25 capacity, which basically would be the addition  
26 of five extra bodies at these three labs, -- the

1 Epi Lab at Brooks would be one body and two  
2 bodies at each of the other two labs -- the  
3 addition of a little bit of extra equipment, an  
4 incubator, refrigerator, and a freezer, and  
5 accreditation of the NHRC laboratory, we can  
6 achieve a surge capacity of about 1,800 specimens  
7 per month.

8           And that would be a start-up cost, not  
9 counting the personnel, just the equipment and  
10 the NHRC accreditation, of \$40,000. And then we  
11 estimate, at least right now until we readjust  
12 some figures, that recurring costs per year,  
13 which would include an additional specimen per  
14 month, would include the five bodies at the three  
15 labs, and would also include -- what they're  
16 proposing for the population-based surveillance  
17 is that the equivalent of a half of a body be  
18 placed at each of the population-based sites to  
19 be the influenza/respiratory disease surveillance  
20 coordinator. So, with all of that figured in,  
21 the approximate recurring cost per year would be  
22 about \$500,000 per year.

23           Next slide. And that's really all I  
24 have. I would just like to say again that we  
25 want to bring this plan back in a final form at  
26 the next meeting to get the AFEB's validation.

1                   And we certainly welcome any questions  
2                   and any comments that you might have right now.  
3                   And there are actually two or three members of  
4                   the working group here. I don't know. If we had  
5                   time, they could make any comments.

6                   PRESIDENT FLETCHER: Thank you, Major.  
7                   Any questions and comments? Dr.  
8                   Clements?

9                   MEMBER CLEMENTS-MANN: Just in terms  
10                  of taking note of the 1997 Avian flu outbreak and  
11                  collecting samples in that part of the world over  
12                  the next year, is there any consideration of what  
13                  kind of quarantine or containment in the event  
14                  that there is an emergence of that strain so that  
15                  those isolates are not brought back to the  
16                  laboratories here that don't have adequate  
17                  containment?

18                  MAJ. FISHER: That is one part of the  
19                  program that we definitely do need to work out  
20                  the response, but I think that's why that it's  
21                  critical that we have this surveillance  
22                  capability as an early warning system for us.

23                  PRESIDENT FLETCHER: Other  
24                  comments/questions? Dr. Haywood?

25                  MEMBER HAYWOOD: Yes. Your three-year  
26                  program would cover how many individuals? Your

1 three-year program, how many people would be  
2 surveilled during that period?

3 MAJ. FISHER: I don't really know how  
4 to answer that exactly. We're expecting without  
5 any kind of outbreak or anything about 1,500  
6 specimens per month. And the program would run  
7 about --

8 MEMBER HAYWOOD: That would be  
9 constant for each month?

10 MAJ. FISHER: Yes.

11 PRESIDENT FLETCHER: Other  
12 comments/questions?

13 (No response.)

14 MAJ. FISHER: Okay.

15 PRESIDENT FLETCHER: Well, if not,  
16 thank you, Major Fisher.

17 MAJ. FISHER: Thank you.

18 (Applause.)

19 EXECUTIVE DIRECTOR FOGELMAN: I would  
20 say if you have any input for Major Fisher,  
21 things that you think that you would recommend  
22 this plan from what you have seen so far, please  
23 provide that to her so that they can take that  
24 into consideration.

25 Our last speaker this morning is  
26 Captain Richard Thomas, the Commander of the

1 Naval Environmental Preventive Medicine Unit 2  
2 here at Norfolk. He's going to be talking to us  
3 about a study that he conducted on upper  
4 respiratory infections on collective protection  
5 system ships.

6 And the ship we're going to look at  
7 today I believe has a similar type.

8 CAPT. THOMAS: No, it doesn't, but  
9 I'll explain that.

10 EXECUTIVE DIRECTOR FOGELMAN: It  
11 doesn't? Okay. Great. So Rick?

12 UPPER RESPIRATORY INFECTIONS ON  
13 COLLECTIVE PROTECTION SYSTEM SHIPS

14 CAPT. THOMAS: Good morning, Dr.  
15 Fletcher, Colonel Fogelman, AFEB Board members.  
16 I'm going to try to talk the next 25 minutes.  
17 Michael is to stay on task and on time because  
18 it's crucial that you show up at the pier at  
19 1330.

20 PRESIDENT FLETCHER: Thank you.

21 CAPT. THOMAS: We're going to keep  
22 moving. I've got 57 slides.

23 (No response.)

24 CAPT. THOMAS: So if we slow down, I  
25 just start the clock.

26 Next slide, please. I'm going to just

1 go through this whole set. This was a project  
2 that was a request from one of our Navy  
3 activities that involved a joint effort by our  
4 epidemiology staff -- next slide, please -- and  
5 our industrial hygiene staff.

6 It started, like all good projects, on  
7 Halloween. And it was a request from the Navy  
8 Sea Systems Command to look at DDG-51 ships based  
9 on a meeting of the ship's officers with  
10 engineers from the Navy Sea Systems Command. And  
11 a number of people from different ships brought  
12 up their observations and concerns about upper  
13 respiratory infections due to what was called the  
14 collective protection system.

15 The CPS is a biological and chemical  
16 warfare defense system, is a positive pressure  
17 zone defense for ships. It has been field-tested  
18 and implemented on ship since 1983.

19 The USS Saipan that you'll go on board  
20 today, LHA-2, the next ship in that class, the  
21 Belleau Wood, LHA-3, was the first ship in the  
22 Navy to have that system. So, unfortunately, you  
23 won't be able to see it. I will try to point out  
24 some other smaller ships that are alongside if I  
25 can.

26 But this system will be implemented on

1 all major naval ships in the future to try to  
2 reduce our risk of biological and chemical  
3 warfare contamination.

4 By the time it got to us, there were  
5 faxes being sent around the Washington, D.C. area  
6 of something called CPS disease. And this has  
7 really gotten a lot of concern. And our request  
8 to the engineers was: Please don't use the words  
9 "CPS disease" without trying to come up with a  
10 definition of what we're talking about here.

11 Next slide, please. This is an  
12 Arleigh Burke class ship. For you historians,  
13 Arleigh Burke was Chief of Naval Operations in  
14 the 1950s. He was also a pioneer in Navy  
15 destroyer operations during the second world war.  
16 His destroyers squadron, the Little Beavers, was  
17 crucial to the Solomon's campaign.

18 This class ship is approximately seven  
19 years old now. It is about 500 feet long with a  
20 crew of 300. It has an enclosed area from below  
21 the water line and the super structure that you  
22 can fight the fight. And all the armament does  
23 not require anyone to be outside on the weather  
24 decks at any time. So all the operations of the  
25 ship can be done in a biological or chemical  
26 warfare potentially contaminated area.

1                   Next slide, please.       There were  
2       several questions that in our discussions with  
3       the NAVSEA engineers were: Do upper respiratory  
4       infections occur more commonly in ships with the  
5       CPS system? This was certainly the subjective  
6       concern of the crews.

7                   And our goals were to research  
8       existing databases and to develop options for  
9       further epidemiological study. And also we took  
10      the approach of using it as an occupational  
11      medicine problem, where we felt of this as -- we  
12      don't like to think of our ships as buildings,  
13      but as a sick building syndrome and how would you  
14      approach it in a fixed facility.

15                  And a question we wanted answered was:  
16      Did the air quality on these ships meet  
17      standards? And did it differ from non-CPS ships,  
18      which, of course, are the great majority of ships  
19      in the Navy?

20                  Next slide, please.       At our initial  
21      meeting with NAVSEA in December of '96, several  
22      things came up. We discussed this question of  
23      upper respiratory infections.

24                  They are very concerned that we not  
25      interview the crew. And, as a result, we still  
26      haven't interviewed crews. But also we wanted to

1 work with the engineers to try to meet their  
2 needs and to try to see if we could plan future  
3 studies.

4 Next slide, please. In looking at the  
5 epidemiological database -- and this was a  
6 foreshadowing of the current issues that we're  
7 struggling. And I know that the Board has heard  
8 about the force medical protection issues.

9 Our preliminary analysis of upper  
10 respiratory infection information was very poor.

11 We have a system called the SAMS, which is the  
12 Shipboard Automated Medical System, where each  
13 person on the ship is entered into the SAMS  
14 system, at least in theory, and then followed  
15 over time with follow-up visits.

16 Also, we wanted to look at it over a  
17 six-month period so that we would look at both  
18 the warm months and the cold months of the year.

19 And we wanted to try to specifically look at the  
20 number of upper respiratory infections.

21 Next slide, please. Upper respiratory  
22 infections are a little bit like taxes and  
23 beauty. They're in the eyes of the beholder.  
24 And we decided to take a more global approach.  
25 Anything that could be in one of these  
26 categories, we would euphemistically call a URI.

1           One of the things we found is these  
2 ships that we studied do not have a physician on  
3 board. So there is some care that is provided by  
4 the independent duty corpsmen on board the ship.

5       There is some care that is provided by  
6 physicians in support units adjacent to the  
7 piers.

8           And there is also something called a  
9 cold pack, where some ships basically give out  
10 Sudafed or other decongestants. And so counting  
11 the number of upper respiratory infections became  
12 extremely problematic.

13           Next slide, please. The average crew  
14 size of the ships. We had three of the Arleigh  
15 Burke class. They are some differences between  
16 what is called the first flight and the second  
17 flight, but the ventilation system on the  
18 original Arleigh Burkes is very similar to the  
19 newer ones.

20           We picked as a comparison ship a ship  
21 with a similar mission, a Spruance class  
22 destroyer, which is approximately 25 years old  
23 now and has a similar size crew but does not have  
24 the CPS system.

25           Next slide, please. Our expected  
26 trends. We anticipated that we would see an

1 increase in upper respiratory infection during  
2 the fall and winter months and that our concern  
3 was that we might see an increase in upper  
4 respiratory infections on CPS ships.

5 And one of the things that crew  
6 members have mentioned is any time you have any  
7 kind of Eustachian tube dysfunction, nasal  
8 congestion, the three-millimeter pressure  
9 difference as you go in the airlock is very, very  
10 noticeable and can be very painful.

11 Next slide, please. This is a slide  
12 of the upper respiratory infections per 100. So  
13 the numbers range from zero to 5 with a crew of  
14 300. And I realize this is a busy slide. But,  
15 just to show there is some variance between June  
16 to November in this slide.

17 Next slide, please. We broke it down  
18 in risk per 100 among the DDG ships. This is the  
19 Arleigh Burkes, just to show you that there was  
20 some variation among the ships, the newer one,  
21 the Cole, having the highest one. And that's of  
22 interest later on.

23 Next slide, please. This is the  
24 comparison ships, the Caron, Stump, and Hayler.

25 Next slide. And a comparison view  
26 where we merged all the data, put in a rate per

1 1,000 with the DDGs, the Arleigh Burkes in red;  
2 and the comparison ships, the Spruance class, in  
3 yellow. And you can see that there does not  
4 appear to be a major difference in upper  
5 respiratory infections among reported individuals  
6 who were seen on board the ship.

7 Next slide, please. This is just  
8 looking at the total number of URIs. Also, in a  
9 crew of 300 during the course of one month, the  
10 highest was only 14 out of 300. Again, this is  
11 people who reported to sick call and happened to  
12 be seen on the ship.

13 Next slide, please. And this is just  
14 looking at doing total numbers for the two class  
15 ships: red and then the study ships and the  
16 control ships being yellow.

17 Next slide, please. We also wanted to  
18 look at the burden of upper respiratory  
19 infections as a percentage of total visits. We  
20 excluded required periodic physicals, follow-ups,  
21 and other administrative exams, such as break  
22 physicals, and again showed that the red, the  
23 DDG, is actually smaller than the comparison  
24 ships.

25 Next slide, please. In summary, for  
26 the epidemiological portion of this study, we

1 found that the maximum number of upper  
2 respiratory infections per month was less than 14  
3 in a crew of 300.

4 There appeared to be no apparent  
5 differences in the total reported numbers in  
6 upper respiratory infections between the two  
7 types of ships. And we did see a mild increase  
8 in upper respiratory infections in the fall and  
9 winter months.

10 Next slide, please. There, of course,  
11 are limitations to this type of exploratory data  
12 analysis. It was a retrospective analysis. We  
13 did not have a clear number of control on  
14 variables or where people sought out medical  
15 care.

16 And then there are data and  
17 reliability issues when you're looking  
18 retrospectively at this. Our big concern was:  
19 Did this data actually reflect the number of  
20 upper respiratory infections?

21 Interestingly enough, when you brief a  
22 number of engineers, we wanted to do the air  
23 quality study first and they really felt strongly  
24 they wanted to see some numbers. So that was our  
25 primary goal in doing this first part of the  
26 study.

1           Next slide, please. There are also  
2 lots of other issues that we did look at on in  
3 port versus underway time. Particularly the CPS  
4 system has three modes. It can either be shut  
5 off, be partially running, and when the ship is  
6 underway, it is fully implemented; and also this  
7 issue of people getting off ship, sick call  
8 visits.

9           I discussed the issue of cold packs  
10 and also the issue of if you have any type of  
11 upper respiratory discomfort, would you be more  
12 likely to seek medical care. And that did not  
13 seem to be the case, even though it certainly  
14 would be a reasonable thing.

15           Next slide, please. So our  
16 conclusions at this point are that there appear  
17 to be no essential difference between the two  
18 classes of ships. And we did not look at other  
19 types of ships based on this. This seemed to  
20 satisfy the question that we were trying to  
21 answer.

22           Next slide, please. Next slide. The  
23 air quality part of it was a little more exacting  
24 and required a lot of work that's beyond the  
25 scope of what we normally do.

26           It turns out in Washington the highway

1 helpers or Beltway bandits are in the adjacent  
2 offices to Navy Sea Systems Command. And there  
3 seems to be some movement back and forth.

4 So we had lots of opportunities to  
5 work with a lot of different groups that we  
6 wouldn't normally get a chance to work with. We  
7 worked with a group called Techmatics and an  
8 engineering group called M. Rosenblatt and Sons,  
9 again using the same class ships.

10 The air quality studies we looked at  
11 48 hours over 3 days, both pier-side and  
12 underway, attempting to try to see if there was a  
13 difference in the air quality during these two  
14 very, very different parts of the ships'  
15 day-to-day experience.

16 Next slide, please. Again, we used  
17 three ships in the Arleigh Burke class -- next  
18 slide -- and three from the Spruance class. And,  
19 again, they were the same ships we did the upper  
20 respiratory infection.

21 Next slide, please. The things that  
22 we did are routine indoor air quality things,  
23 such as CO<sub>2</sub> monitoring, using real-time CO<sub>2</sub>  
24 monitors; temperature and humidity; ventilation;  
25 -- this is cubic feet per minute fresh air -- and  
26 also the rate of change in air changes per hour.

1                   We looked at three different areas.  
2           CIC is the Combat Information Center. It is the  
3           nerve center of the ship. It is below the water  
4           line. It is an area of intense operations, and  
5           it is an area with lots of computers and lots of  
6           people. And they shut the ventilation off during  
7           general quarters. So that comes off.

8                   We also looked at in one of the  
9           berthing spaces and also the crew's mess. The  
10          engineers, interestingly, also wanted us to do a  
11          one comparison group on one weather deck site,  
12          which we did.

13                   EXECUTIVE DIRECTOR FOGELMAN: Do you  
14          want to explain what general quarters is in case  
15          --

16                   CAPT. THOMAS: Yes. I was going to  
17          show you. General quarters is battle stations.  
18          It's where the ship goes from a normal steaming  
19          operation. It only occurs underway.

20                   And all the armament is fully ready to  
21          go. All the guns are ready. And all the  
22          electronic systems are on. And the power demands  
23          for all that additional equipment require people  
24          to work in a very tight environment, usually more  
25          people in smaller watch stations. And there is  
26          also less ventilation because of the power

1 requirements for all this other equipment.

2 We also looked at something called the  
3 MVOC, Microbial Volatile Organic Compound. This  
4 is an interesting test, and it's something we  
5 hadn't used before.

6 This is kind of like having your  
7 mother come to visit your home. And it is a  
8 quantitative measure of how much dirt do you have  
9 in your house. We were using it as an indicator  
10 of microbial presence. We did measure it in  
11 three sites and one external baseline. Again,  
12 the engineers were very interested in getting an  
13 outside MVOC.

14 Looking at indoor air quality, there  
15 are a number of standards for buildings. There  
16 is ASHRAE, which is the American Society of  
17 Heating and Air Conditioning. There is ACGIH,  
18 which is the American Conference of Governmental  
19 Industrial Hygienists. SNAME is a naval  
20 architectural mechanical engineer group.

21 There also are some design criteria.  
22 Remember, we were working with engineers. And  
23 they have a number of things that they work on.  
24 And they have sets of criteria for temperature  
25 and humidity for these ships.

26 Next slide, please. And there are

1 also air quality standards for air changes per  
2 hour and air flow.

3 Next slide, please. Remember, we  
4 weren't allowed to submit a questionnaire to the  
5 crew about how they were feeling, but we were  
6 able to ask them how they felt about their  
7 equipment.

8 We did do that, and we found that  
9 where there were big issues about maintenance  
10 because these require a lot of work to be done.  
11 And there's a lot of work that has to be done in  
12 what are called fan coil rooms and oil assembly  
13 drain pans. As we go through the ships today,  
14 I'll try to show you some of these things as they  
15 come along.

16 Gaylord hoods are used in cooking  
17 spaces because, again, you're basically cooking  
18 inside. And ventilation of cooking gases is  
19 important and exhausting if it's another area.  
20 That's moving air ventilation out.

21 Interestingly enough, the engineers  
22 said and even though you have this CPS system,  
23 which is basically a closed system, the number of  
24 air changes per hour and the amount of air is  
25 designed to be the same as a non-CPS ship.

26 Next slide, please. This is what a

1 filter bank looks like.

2 Next slide, please. This is a HEPA  
3 filter system similar to some of you may have had  
4 some experiences with. Unfortunately, it tends  
5 to turn people red after a while working on this  
6 system, but it is a fan coil system that allows  
7 you to do maintenance on this equipment.

8 One of the big difficulties we have on  
9 ships is with a crew of 300, it seems like a lot  
10 of people. But there are lots of things to do.  
11 And sometimes maintenance on these units is not  
12 all that it should be.

13 Next slide, please. One of the things  
14 we found, -- and many of you have had some  
15 experiences working with operational forces -- we  
16 found that, of course, we are very dependent on  
17 the ships' schedules.

18 We had underway conflicts with general  
19 quarters -- GQ is general quarters -- inspections  
20 and variable power. Variable power means that  
21 sometimes people would unplug our stuff if we  
22 were not looking.

23 (Laughter.)

24 CAPT. THOMAS: And also,  
25 interestingly, the ship has its own electrical  
26 power system. And there are large power surges.

1       And some of our equipment had some power  
2 lock-ups.

3               The other issue was the microbial  
4 volatile organic data took about two to three  
5 weeks. So that if there was a question, we were  
6 always several weeks behind in trying to analyze  
7 that. And weather changes do influence this.

8               Next slide, please. There were a  
9 number of things we looked at just trying to see:  
10 Were people doing the correct maintenance on  
11 equipment? Do they have the right training? PMS  
12 here is preventive maintenance on the different  
13 parts.

14              Next slide, please. This is looking  
15 at average CO<sub>2</sub> levels in the combat Information  
16 Center. The ACGIH standard is 1,000 parts per  
17 million, which is right here. And you can see  
18 that IUP is in port and underway. You can see  
19 that it does dramatically increase.

20              This is of concern and something that  
21 we are really looking at because increased CO<sub>2</sub>  
22 levels cause lethargy, fatigue, and increased  
23 anxiety, increases your stress level. And these  
24 are people who have got their hands on the little  
25 button that makes the weapons go. So this is an  
26 issue that we are struggling with.

1                   Next slide, please.

2                   MEMBER HAYWOOD:    Did you look at CO  
3                   levels?

4                   CAPT. THOMAS:       We did not look at  
5                   carbon monoxide levels.    We didn't have that  
6                   capability at this time.

7                   This is a real-time monitor looking at  
8                   CO<sub>2</sub> levels for one of our ships.    And this is  
9                   during the general quarters period.   One of these  
10                  is humidity; one is temperature.   And then this  
11                  is the CO<sub>2</sub> level that went up during a period of  
12                  time in general quarters.    And it is fairly  
13                  dramatic.

14                  Next slide, please.    This is looking  
15                  at the crew's mess, both at average in port and  
16                  underway, where the heat seems to be better.   Of  
17                  course, most people don't eat during general  
18                  quarters.    So the measurements tend to reflect  
19                  times when they were actually eating in the  
20                  crew's mess.

21                  Next slide, please.    And the same  
22                  thing with berthing.    Again, they were below the  
23                  ACGIH standard.

24                  Next slide, please.    So our CO<sub>2</sub>  
25                  exposure, we found the highest levels on one  
26                  particular ship, one of the newer ships, but we

1 found out that crew at messing were below 1,000.

2 And this high CO<sub>2</sub> is of concern in that it causes  
3 difficulty in concentration, drowsiness, and  
4 increases your respiratory rate.

5 Next slide, please. Looking at air  
6 changes per hour and CIC, the newer ships,  
7 particularly one of the DDGs, had an incredible  
8 20 changes per hour. An average space like this  
9 would be about 12 per hour.

10 Next slide, please. And this is the  
11 standards for the crew mess. They were  
12 significantly lower.

13 Next slide, please. And berthing was  
14 a little bit better on the newer ships.

15 Next slide, please. And air changes  
16 per hour -- I'm sorry. I was talking about cubic  
17 feet per minute in those slides. These are air  
18 changes per hour. And these were significantly  
19 lower than the recommended three air changes per  
20 hour. As I said, 12 air changes per hour would  
21 be the average for an office building.

22 Next slide, please. Same thing for  
23 the crew's mess. The DDG seemed to be doing a  
24 little bit better in this thing.

25 Next slide, please. And next slide.  
26 So the summary on air changes per hour was that

1 we found that the DDGs had better ventilation,  
2 about 20 percent fresh air, and that they seemed  
3 to be better than the older ships, which is not  
4 surprising.

5 Next slide, please. Relative humidity  
6 was another measure of what we're trying to see  
7 about indoor air quality. Again, the older ships  
8 had higher humidity, above what the recommended  
9 standards were.

10 Next slide, please. And next slide.  
11 Oh, go back one. This is an example. This was  
12 MVOC data in the CIC on one of the DDG ships, and  
13 it was dramatically higher. This captain's  
14 mother would not be happy if she showed up with  
15 this.

16 We retested this since it was our  
17 first time. And the follow-up test was below  
18 what all the other ships were. So we were not  
19 able to say exactly what that was.

20 Next slide, please. Relative  
21 humidity. The crew's mess was a little bit  
22 higher on the in port but lower underway on the  
23 older ships.

24 Next slide. And MVOC data again for  
25 the crew's mess. The one ship was higher.

26 Next slide, please. Berthing on the

1 DDGs was higher.

2 Next slide. And next slide. So the  
3 overview was that the average humidity levels  
4 were within the 30 to 60 percent. Interestingly  
5 enough, the DDG-58, the one with a high MVOC, was  
6 actually the cleanest of the 6 ships that we saw.

7 So we were really unable to figure out exactly.

8 And we looked specifically in drain pans and in  
9 the ventilation system, looking for microbial  
10 overgrowth.

11 We had heard rumors of green slime  
12 climbing up the walls, and we were not able to  
13 find that. And the older ships did have higher  
14 humidity levels. And there was some concern  
15 about water damage structure. But, really, these  
16 rates, the numbers were about the same.

17 Next slide, please. Air temperatures  
18 were a little bit higher in the older ships, next  
19 slide, in CIC, in the crew's mess. A temperature  
20 of 90 degrees really gets to be pretty  
21 uncomfortable.

22 Next slide, please. And we did some  
23 measurements of -- these are some of the  
24 real-time monitoring that we did of the ship.

25 Next slide, please. And these are the  
26 average temperatures in the berthing spaces,

1 which were a little bit better.

2           Next slide. So the newer ships were  
3 well within the standards. The older ships,  
4 which are now 25 years old, many of these ships  
5 are approaching the end of their service life.  
6 They were much higher, particularly in the crew's  
7 mess area.

8           And we found that a lot of the older  
9 ships, the ventilation just isn't working at all  
10 in some spaces. And that correlated with our low  
11 cubic feet per minute data that I showed earlier  
12 and the rate of air changes.

13           Next slide, please. So as we sail  
14 away -- these ships were actually built in  
15 Pascagoula, Mississippi and the coast of Maine.  
16 And as we sail off into the distance, we're left  
17 with the question: Do we have CPS disease or  
18 not?

19           Next slide, please. So here is the  
20 capsule summary. I could have just showed this  
21 slide, and you would have been --

22           (Laughter.)

23           CAPT. THOMAS: But this is ventilation  
24 on the newer ships. Ventilation is kind of okay.  
25 CO<sub>2</sub> levels were very high with the humidity. And  
26 MVOC on two of the ships was very good, and the

1 other one, we found one elevated level. When we  
2 repeated it, it was lower than the other two.  
3 The older ships, ventilation and temperature are  
4 big problems. And the other factors were neutral  
5 at best.

6 Next slide. The conclusion of all of  
7 this is that I think that we will end up doing  
8 this sort of study on a very rapid turnaround  
9 because there is a very heightened awareness of  
10 anything new at the Department of Defense, be it  
11 anthrax vaccine, post-Gulf War illness, and all  
12 the issues that we've dealt with as an  
13 organization. Any time something comes up that  
14 gets the moniker of a CPS disease, this is going  
15 to attract attention and concern in lots of  
16 folks.

17 Next slide, please. Any questions?

18 PRESIDENT FLETCHER: Comments or  
19 questions? Dr. Barrett-Connor?

20 MEMBER BARRETT-CONNOR: Did the  
21 captains know that their mother was coming?

22 CAPT. THOMAS: No. This was a random,  
23 double-blind study.

24 EXECUTIVE DIRECTOR FOGELMAN: I guess  
25 my question is: What kind of risk communication  
26 did you use after this study?

1           CAPT. THOMAS: You know, that's is an  
2 interesting question. We haven't gotten that  
3 far. We have briefed people in Washington. And  
4 they basically told us to wait. So we haven't  
5 gone back to it. And that's something we  
6 struggle with. We have done a lot of work on  
7 ships, and we are still waiting to go back and  
8 brief the ships on this.

9           PRESIDENT FLETCHER: Dr. Allen?

10          MEMBER ALLEN: The Navy, of course,  
11 this is not really a unique experience because  
12 you have had submarines for a long time.

13          CAPT. THOMAS: Yes.

14          MEMBER ALLEN: How does this compare  
15 with what you find on some of your better later  
16 class of submarines?

17          CAPT. THOMAS: We looked at that issue  
18 because we were going to try to use submarines as  
19 an -- this type of question has not come up.  
20 Part of the issue is most of our nuclear  
21 submarines when they are underway, they are  
22 underway. And that means they are under water.

23                 Our missile submarines are underway  
24 for 68 days. And basically once you're under  
25 water, you do not come up. A couple of them have  
26 what are called new control breaks now, where

1 they come out for about a four-day period in  
2 Hawaii.

3 But most of our ships, particularly  
4 the attack submarines, they are underway. So  
5 they don't have that pressure differential that  
6 you notice on surface ships because people aren't  
7 going in and out of the hatch.

8 PARTICIPANT: Are there opportunities  
9 for people to wash their hands on board ship?

10 CAPT. THOMAS: There are more  
11 opportunities than people who use them. That's a  
12 good point, and that is something we have  
13 struggled with. We have two big problems on the  
14 ships. One is, as the colonel has mentioned,  
15 washing our hands, but also getting people to  
16 drink water. Most of our folks do not drink  
17 enough water.

18 I know one of the ships I served on  
19 was because we used to have fuel oil in the  
20 cross-connection. So it gave a kind of a kick to  
21 the water.

22 PRESIDENT FLETCHER: Do you have  
23 filtered water?

24 CAPT. THOMAS: We do not have filtered  
25 water, no, that I know of. I can ask that, find  
26 out about that.



1 underway is not going to be filtered, but --

2 CAPT. THOMAS: It's usually what's  
3 called a flash system. It's heated to a steam  
4 and then returned back to liquid status.

5 LCDR. FALLON: And then chlorinated.

6 PRESIDENT FLETCHER: Dr. Perrotta?

7 MEMBER PERROTTA: Just following up on  
8 two questions at the end of the table. I guess I  
9 would strongly recommend that if you can possibly  
10 share this information with the sailors on board,  
11 not give it to just the leadership.

12 CAPT. THOMAS: Right.

13 MEMBER PERROTTA: And I know how  
14 difficult that would be with command and all of  
15 that. But on the civilian side, you give  
16 information to city leaders. And if the people  
17 that live in that city don't trust the city  
18 leaders, you have wasted every bit of your time  
19 and effort.

20 This truly can't end up being a risk  
21 communication issue. So if there is ever an  
22 opportunity for you to get this into the hands of  
23 the people, the sailors on board, that may help  
24 you a lot more than anything else because this is  
25 not truly an environmental problem. It probably  
26 could blow up in your face.

1           CAPT. THOMAS:    It is a very strong  
2    perception problem.    In that, if nothing else, I  
3    agree with you.

4           MEMBER PERROTTA:  Thank you.

5           PRESIDENT        FLETCHER:                More  
6    questions/comments?

7           CAPT. THOMAS:    Could I just stand by  
8    for any other questions?  I know Colonel Fogelman  
9    is going to keep after me to --

10          PRESIDENT FLETCHER:  Yes?

11          DR. J. GAYDOS:  Joel Gaydos from 103.  
12          We have had this problem for a long  
13    time.

14          CAPT. THOMAS:  Right.

15          DR. J. GAYDOS:  And I think that the  
16    real cure is to somehow find out what you need  
17    and get those requirements into the system's  
18    development for what is now being developed for  
19    the future.

20                 Is there a process for doing that?

21          CAPT. THOMAS:  The engineers that we  
22    have been working with, that is something we're  
23    looking at.  One of the things we have found is  
24    that if the equipment is kept up to the  
25    specifications, a lot of these complaints seem to  
26    be less.

1           The issue is that the military  
2 personnel turnover on the ships is approximately  
3 seven percent per month on some ships, which is  
4 as high as it is for some other military units.  
5 So we have this tremendous retraining issue, and  
6 we have gone from 570 ships to 350 ships without  
7 doing anything, without not going to anywhere or  
8 doing anything less.

9           Maintenance time has really dropped  
10 out. You'll see it today on the Saipan.

11           PRESIDENT FLETCHER: Colonel Fogelman?

12           EXECUTIVE DIRECTOR FOGELMAN: If we  
13 could hold questions for a little bit? I think  
14 we need to press on, and I would like Captain  
15 Thomas and Captain Hyashi to just very quickly  
16 give us a little protocol piece when we go on the  
17 ship today before I lose everybody, before 1:00  
18 o'clock --

19           CAPT. THOMAS: If anybody has  
20 high-heeled shoes on, I'd encourage you if you  
21 brought your Adidas or your Reeboks, to put them  
22 on because you will be stepping over a lot of  
23 things.

24           As you come up the ship, we will take  
25 you up the accommodation ladder. Hold onto the  
26 railing. I don't mean to be condescending about

1 this, but they are very short steps and they are  
2 not the routine height. So it's a little uneasy,  
3 and it's not unusual for people to take a dive.

4 As you come up the accommodation  
5 ladder, as you come up the accommodation ladder,  
6 remember, submarines are round in the front. And  
7 surface ships are pointy in the front. But the  
8 bow will be on your right, and the American flag  
9 will be on your left.

10 As you come up, if you're in uniform,  
11 you turn and you salute the American flag. If  
12 you're in civilian clothes, it's polite just to  
13 turn and face the American flag about three feet  
14 from where you're going on board.

15 And there will be many officer's  
16 representatives. It's called the officer of the  
17 day. He will stand there and say -- each person  
18 in military service says, "I respectfully request  
19 to come aboard, sir" or "ma'am," as the case may  
20 be. And you salute.

21 Even though the person may be -- you  
22 know, for the military folks to say, "Why am I  
23 saluting this person who is an E-4 or an E-5?";  
24 he or she is the commanding officer's direct  
25 representative. And, trust me, they outrank you.

26 (Laughter.)

1 EXECUTIVE DIRECTOR FOGELMAN: So  
2 salute the flag.

3 CAPT. THOMAS: So you salute the flag.  
4 And you walk up and say, "Request permission to  
5 come aboard, sir" or "ma'am." And then basically  
6 since there is a large group or maybe go in a  
7 couple of groups, you will be moving onto the  
8 hangar bay. You will be one level below the  
9 flight deck. And they will probably keep you in  
10 groups. And we will probably have three or four  
11 groups by the time we're all done.

12 You know, it's like a field trip.  
13 Please stay together.

14 (Laughter.)

15 CAPT. THOMAS: If you see something,  
16 if there are what we call knee-knockers or things  
17 in the way, tell the person behind you. It is a  
18 unique environment.

19 Military folks who have an ID card,  
20 they may want to see your ID card. In this  
21 group, I don't know if they will or not, but  
22 maybe. If you don't have an ID card, they may  
23 hold you up. For Board members, that is not  
24 going to be an issue.

25 EXECUTIVE DIRECTOR FOGELMAN: Do we  
26 need to wear blouses?

1 CAPT. THOMAS: No.

2 EXECUTIVE DIRECTOR FOGELMAN: Okay.

3 MEMBER STEVENS: I don't understand.

4 The civilians salute the --

5 CAPT. THOMAS: No.

6 MEMBER STEVENS: We don't salute  
7 anybody; right?

8 CAPT. THOMAS: Civilians don't have to  
9 salute.

10 EXECUTIVE DIRECTOR FOGELMAN: He said  
11 if we --

12 CAPT. THOMAS: You do have to ask to  
13 come aboard. It would be polite if you come  
14 aboard. It's their ship, you know.

15 LCDR. FALLON: Stand and recognize.  
16 So you pause there and recognize the American  
17 flag. And then you pause and request permission  
18 of the officer.

19 MEMBER BARRETT-CONNOR: About that  
20 point, the person behind you is --

21 (Laughter.)

22 CAPT. THOMAS: If you have soft shoes.

23 And the other thing is they do not want  
24 open-toed sandals. I don't know if anybody is  
25 wearing any sandals today. Open-toed sandals.

26 Konrad, anything else?

1                   CAPT. HYASHI: Captain Thomas will be  
2                   in the first group. So for military folks, if  
3                   you just sort of follow his lead, there will be  
4                   no problem there.

5                   And we will be joined by Rear Admiral  
6                   Select Lynch, who is the Deputy Fleet Surgeon for  
7                   our U.S. Atlantic Fleet. He will be in the last  
8                   group. And because we have such a large number  
9                   of senior individuals and he is the most senior  
10                  of all of us, they will render salutations to  
11                  him, which is called bonging. That's not the  
12                  1960s bong.

13                  (Laughter.)

14                  CAPT. HYASHI: There will be a number  
15                  of bells and announce him. And when he gets  
16                  aboard, he will be remembered, singing and so  
17                  forth.

18                  We will be met up on the quarterdeck.

19                  And then we will go into the ward room. And  
20                  they will give us a command briefing. And then  
21                  we will break up into different groups and go  
22                  around the ship.

23                  We have got some briefing, just a  
24                  little bit of material about the amphibious  
25                  assault ship Saipan. And if you have questions,  
26                  we will have a couple of medical reps in each of

1 the groups.

2 So please feel free to ask questions.

3 If you have questions that you want to get  
4 answered and you don't get them answered on the  
5 tour, either let one of the Navy folks around  
6 here or myself know at the end of the tour. And  
7 we will make sure we have answers for you  
8 tomorrow.

9 PARTICIPANT: Can we take pictures on  
10 those ships?

11 CAPT. HYASHI: It should be no  
12 problem. We will ask the individual who is your  
13 tour guide. We won't have a little flag for  
14 them, but --

15 CAPT. THOMAS: Usually it's not a  
16 problem.

17 CAPT. HYASHI: It should be no  
18 problem.

19 CAPT. THOMAS: Just as a courtesy,  
20 ask.

21 CAPT. HYASHI: We're trying not to go  
22 into the most secure areas. And if anybody here  
23 is a foreign national, I probably should know at  
24 this point, but I don't think it's any problem.

25 PARTICIPANT: Should we take our  
26 briefcases with us? We're not coming back here,

1 are we?

2 EXECUTIVE DIRECTOR FOGELMAN: No.

3 We'll have a place for you. Depending on if  
4 you're coming back here or going to the BOQ,  
5 we'll have a place for you to put your briefcase.

6 Check with Major Fisher.

7 MAJ. FISHER: If you want to go  
8 directly back to the BOQ from the tour and you  
9 don't have anywhere else to put your personal  
10 belongings, you can put them in the NEHC van that  
11 is parked out front here. And that van will  
12 deliver them to the BOQ and should be there when  
13 we get back from the tour.

14 EXECUTIVE DIRECTOR FOGELMAN: I'd like  
15 to say one more thing about dinner tonight. We  
16 have about 21 people signed up. I'd like to have  
17 everyone meet at 6:30 in the lobby. We have a  
18 dinner reservation, which is 7:00 o'clock. So  
19 for those who signed up, please meet at 6:30 in  
20 the lobby at the BOQ.

21 And I think we can adjourn for lunch  
22 unless anybody has any questions.

23 MAJ. FISHER: The lunches aren't here  
24 quite yet. They should be here shortly. When  
25 they do arrive, they will be in the Gray Room,  
26 and they will have your name on them. And if you

1 are one of the couple people who haven't paid  
2 yet, you can pay --

3 CAPT. THOMAS: What time are the buses  
4 leaving?

5 EXECUTIVE DIRECTOR FOGELMAN: The  
6 buses will leave at 1:00 o'clock, which means you  
7 must be here before 1:00 o'clock.

8 (Whereupon, the foregoing matter was  
9 concluded at 11:53 a.m.)

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