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MEDICAL BRIEFING
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Apollo 14
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SPEAKER Gentlemen, we have a briefing at 2 o'clock so if we'll get started here with the Apollo 14 Crew Medical Briefing, Dr. Charles Berry, Director of Medical Research and Operations at the Manned Spacecraft Center. And Dr. William Kemmerer.

SPEAKER The floor is your's Bill.

SPEAKER Any questions?

BERRY Well, gentlemen, there are a few things that I think we ought to try and capsule for you. It's obvious that we're not going to be able to cover, I'm sure, in the period that we have available here everything that you might want to know about the medical nature of this particular flight. I would like to try to encapsulate a couple of things that I feel are differences - that are of import because we're on the verge of instituting one of these at the moment and I think you need to have some understanding about what we're talking about with that particular program. And that's the Flightcrew Health Stabilization Program. I'd like to start out with that as a basis of the discussion. Now in all of our discussions of briefings with the crew and so forth, we timed them in the shortest se've ever done. It's 2-1/2 hours. So I don't know. We don't have that kind of time and I'm going to try to do in half an hour what we've done in 2-1/2 hours. So we'll see if it goes that way. You're all aware, I think of the background of the fact that starting back at the time of Project Mercury, even with the short duration flights that we had there, we had to worry about what are you going to have some guy get ill during - just before the mission or particularly we're concerned about an illness during the mission. We were protected pretty well in those launches by the very short duration of flights. We did have some illnesses where we had some upper respiratory type illnesses, common cold type things, influenzal diseases that occurred in crewmen, but nothing that ever really held up the flight. Then Gemini came along, and when we realized we were going to have 4, 8, and 14-day flights, this became much more of a concern and we had crew quarters at that time, in the building where they are now, in the MSOB, at the Cape and at that time a plan was evolved whereby the crew should try and spend the bulk of their time for the 21 days before flight in that particular building - living in the crew quarters area and we would try to cut down their contacts. It became obvious that the things that they had to do in the final checkout period in that 21 days and training and so forth, that it was very difficult to do anything about totally eliminating contacts. So it was a very hard thing to exert any kind of control over and we had a lot of things happen in Gemini. Again, we never had a flight stop, we did have some crewmen who were ill in the crew quarters, up until

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BERRY shortly before launch, however, and we had exposure to things like mumps in the immediate preflight period and where with crewmen who were susceptible and a number of incidents of this sort which really gave us a - added a few gray hairs here and there at any rate. Then Apollo came along and I think you're all familiar with the Apollo story and what happened starting out with Apollo 7. And there has been a series of events in Apollo 7 and 8 and then 9 came along and we, for the first time, had to hold up a flight for medical reasons of an infectious disease that the crewmen had in the immediate preflight period. And that's a painful kind of decision to make and it was done again, as we got to the lunar missions with Apollo 11 we had more concern about this and we've had our ups and downs of various types because of trying to prevent illness with the crew. Now, Apollo 13 brought it home again and emphasized the situation for us where we had a crewman who developed an infectious disease which is preventable by having a vaccine available but not something which you would normally prevent in adult males. In short, you would not go around and advocate an immunization program for rubella in adult males because there just aren't enough people who are susceptible. Well, we find we can't live with that in our own program and we had to make some modifications and so we have designed a thing we call Flightcrew Health Stabilization aimed at - could we have that first viewgraph please - we have this aimed at the idea of trying to minimize the possibility of any adverse alteration in the health of the flightcrew either before, during, or after the flight. Now that's why we call it Flightcrew Health Stabilization to get away from the word quarantine, because it isn't a quarantine in any sense of the word like in the postflight situation. It is not a quarantine, so that's not a proper word to use with the thing because they certainly are not quarantined in that sense. They - We are trying to stabilize their health at a given level and hope that they're not going to have some illness interfere with their capability to perform. Now, I'd like to emphasize to you, there's a word used in this viewgraph. It says to minimize or eliminate. I think I'd like to emphasize to you that we could almost cross that off in the viewgraph because we cannot eliminate. There's nothing that we can do in this program that is going to guarantee elimination of illness in the crew. All we can do is minimize it and if it is all done properly, it will minimize it, but we certainly cannot eliminate it by that thing. So I think that we shouldn't say that if we do see an illness develop that obviously the program was no good. Because that is not our immediate case. We realize that there are some holes in this thing and we'll point them out to you.

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BERRY as we go along. I think you'll be aware of them even if we don't point them out. Okay, next please. Now I'd like to take a minute to tell you something about disease so you'll have some understanding about this. The same way we've talked to the crew about it. You realize that in any human being there are several things which make an infectious disease possible. The first thing is, that you have a certain amount of resistance as an individual. This resistance is really of two kinds of resistance. You have some natural immunity which you acquired from your mother when you were being carried in the period of gestation and if you were breastfed, you acquired some more immunity after you were born from her. And then you have certain immunities that you pick up just from your own natural exposures of yourself. That's a natural immunity and that varies in every individual. And there - it's a difficult thing to titrate. Acquired immunities can be done by the means of immunization which you're all familiar with. You know that there are certain things that we can immunize you against and thus give you immunity. We again, most of those immunizations aren't 100 percent either. And what they do is they elevate that to a very high level. They give you some antibodies and again, depending upon your resistance, your total resistance picture, which is complicated. It isn't just a simple thing that says that there's an antibody level and that means resistance. Fatigue can alter resistance, certainly and there are feeling on part of some immunologists even that mental attitude can even alter resistance. We certainly know that fatigue and general physical health state can alter immunity. Now the other thing we could do is we could, for instance, in certain conditions, like hepatitis is an example, you could use gammaglobulin which has somebody else's immune antibodies in it. You could use that and that's a temporary sort of thing. And you give that to the individual and gives them some temporary kind of immunity - it's borrowed immunity so to speak. Because he doesn't have time to build up the immunity you give that as a protective measure initially. The other thing you could do, of course, if the organism is susceptible to an antibiotic you can give them an antibiotic, obviously. And that would be something that would help as immunity. Now, that resistance picture then, if you're going to create a disease, if you're going to create an infectious disease, you have to have a dose of an organism that is going to overcome this resistance no matter what the type is, in order for you to get an illness. And you can receive a dose of an organism and not get an illness. So you have to have exposure to some organism then. Now there are organisms that we all have in our bodies and we call this sort of exposure latent

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BERRY exposure. There are organisms and if we were to culture all of you in this room, we might on a throat culture find, or on skin cultures, and we do this on the crew, we might find betahemoletic strep as an example in the throat culture. It's not causing you an illness. You have no sore throat at the present time, that organism is there. It's a potential pathogen for you but you're not ill at the present time. You could - and you know we have had diseases produced by staphylococcus in the crew. In the postflight situation and during flight and this has been as a result of what's happened to staphylococcus which they themselves had, that wasn't given to them by anybody. It's an organism they started with and then it did produce disease. So there are potential pathogens which you all harbor - -

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SPEAKER disease so that potential pathogens which you all harbor and if your resistance is lowered by something that organism or the changes or the balance between organisms in your body altered by something and certainly spaceflight does that, is possible that you could then develop a disease from your own organisms that you had there all the time that are potential pathogens and that's always an argument on our part. Do we go ahead and remove those potential pathogens? Should you in essence sterilize that individual as far as potential pathogens are concerned? If you do that you pay some price for that because you alter bacterial balances and you also ask for the development of some of the fungi and because the bacterial balance is altered. As you know, any of you might have taken some of the broad spectrum antibiotics, for instance, that's what happens if you take penicillin, for instance, and some of you may have had some of the bad after affects of that where you ended up with cleaning out all of the bacteria out of their gut. And having to try to build them back because you killed them all off with an antibiotic. And you have the fungi starting to develop and sometimes the result of that is worse than the original disease that you had. Now, the other ways that you can get exposed, of course, are exogenous exposure which comes from outside somewhere and the most frequent of these is person to person contact. That's if you're in a room - it does not have to be where I'm close enough to you - to actually transmit organisms - by standing talking to you and even as I am here you are going to get some organisms from me. There's no way and I'm getting organisms from you, because those are being spread around this room. And those of you who are sitting right next to each other and are talking to each other, there's a certain amount of spray everytime that you talk and breath that goes out from you and carries a certain number of organisms so you're exchanging these organisms all the time. In the air conditioning systems here you can pick it up. You're being exposed to organisms of people who aren't even in this room, who are in other parts of this building and their organisms are being put into this room and you're breathing them. And so, that's a kind of a situation we face in a person to person contact. Now consumables it's pretty obvious, other than the air that we've already talked about, there is food and water and you must control the food and water. You could obviously take an organism in, even in the water that you drink or the food that you eat. You're all familiar with that if you've ever been to Mexico. Now,

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SPEAKER the other thing that you can transmit organisms by is a term called foamites and what that means is if I had a kleenex here in my pocket that I had blown my nose on and I leave this kleenex here and on the table and and somebody else comes along and moves it within a time period that there hasn't been a die off of the organisms here, because there is nothing for them to grow on, they'll last only a certain period of time, that's a foamite. The table could be a foamite. The old stories about toilet seats. A toilet seat could be a foamite. Anything can be a foamite that's an inanimate object - is a foamite. But most of the stories about toilet seats are totally untrue. However, just for your own personal information. Can we have the next one please. Now, this program comes down to this. If we have to, we've decided on 21 days again as a time period that is the same as what we're doing with the post flight. And, you're all aware that there are diseases that don't fit in that 21 days. And that's the first question we get asked. Hepatitis is one of those. You could think of leprosy which has an incubation period of years. Well, obviously, we're not going to have a period of isolation or health control that can last that long so you have to take some reasonable period. And, 21 days has been selected as that period. We will implement then a series of programs that are - there's a program, an epidemiology program which means that we are to look at what illnesses occur or the crew are exposed to, that they are aware of, anything they are aware of. We're also looking in the community at large both at the cape and here, we're looking at the community where these people might be exposed or where their primary contacts might be exposed. Now we have designated a number of primary contacts. And, that number now is about, I think, with having to add some air sampling people it comes out to about 148. I'm not sure that number is exactly correct at the moment but I think that that's a fairly accurate number. I guess it looks like it's 160 total with the people that we have - with the people that will be here in the MSC area too. There are some that are here as a potential in case the crew - we had a trainer bomb out and we had to bring the crew back, so there's a total of 160 people now on our list, of primary contacts. These people have all had a basic physical exam completed as of now. They have had immunizations done following a serologic survey. We did serologies to determine their immunity status, immunized them to the things that we could immunize them to that they didn't possess immunity for. We then are getting

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SPEAKER daily reports of these individuals as to whether they or any member of their family have an illness. And, starting Monday morning, at 0:630, this coming Monday morning, at 0:630 that is when the 21 day period starts and from that point, in fact we're going to start that even on the weekend, here, that the - and we've been doing some of this at the Cape already, as a trial. And, these people then report if they have had anything occur in their families or to themselves and notify us of this and we have an office that we run 24-hours a day at the Cape and here and these people report anything that they have had of a suspicious nature and a determination is made. Even, they will be - they will have laboratory samples taken so as to whether they should report to work and thus be potentially exposed to the crew or not. So, there a number of these primary contacts. The only family members that are on the primary contact list are the wives. There are no children on the primary contact list as far as the prime and backup crews are concerned. Now, the control of some areas. And, I'll show you those areas in a moment, is done by security. We have made some modifications at the Cape in the airconditioning for each of these areas that I'll show you in a moment. We have made sure that the areas where the crew are spending their time have controlled airconditioning so that do not, in effect, have happening what has happened to us in this room, where we are being exposed to organisms that are coming from people who are working anywhere in this building. We have put bacteriological filters into the airconditioning system and we have separate airconditioning systems for each of the areas in which the crew will spend their time and those modifications are complete at the present time. I've already told you we have completed these examinations and immunizations on the primary contact and this program of gathering information from the local health authorities, from the schools and from the families is already started. Next please. Now, this program, from the astronaut point of view, has several things. There's no difference in their care, their astronaut care for the crews and their families is the same as it's always been. It's conducted by the fine medicine branch in my own office and it's a continuous program, of course, the only thing that's different here is that the families do report to us every single thing that happens to them. Even if it's a thing that they normally would not seek medical assistance for, whatever it is is reported to us and discussed and a decision made on that at the time. Next, please. Now, the

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SPEAKER immunizations that the crew, well, first, the survey, the serilogic survey. We have a serum bank. Every time we draw blood from the crew we maintain a sample of that blood in a frozen state of the serum and that's one of the things that's very valuable to us in a rubella episode because we could then get a time history - you go back and look at immunities status of any given point in time on any individual. We have one skin test for tuberculosis. All of these are serilogic tests, in short, you use the serum, the blood serum, and we looked - we checked the blood center for every one of these with the exception of adnal virus 4. We have removed from this list that you see here and I'll tell you why in a moment. We checked the immune level on all of those things and we determined whether the individual possesses immunity or not. And, I don't know what the level of that immunity is. Next, please. And it's been done to crew and primary contacts. Now the requirements for immunizations you see on this chart, what things we will then immunize to and you'll note these that are in parenthesis are the ones that we had already been immunizing the crew too keenly. Now, there are certain ones on here that certainly we don't think are problems. Yellow fever, for instance, is nothing we expect the crew to get exposed to or develop in the preflight situation here. It has some benefits in helping to provide some overall immunity and it's a worldwide immunization thing depending on where the crew might end up. We don't know where the crew men are going to end up in this situation. So, the other thing here we are not using the adnal virus type 4, this is the condition, it's an upper respiratory type disease that is common in recruits. It was seen in the military services particularly in the Army and a vaccine was developed for this. It's an experimental vaccine still and while we had it in the original series because of that there was great difficulty in trying to obtain it because of its research nature and therefore, we have removed that from the list and with the concurrence of the people at the communicable disease center too. They agree that that's a risk of not having that as certain of nothing that should concern us. Now in the case of mumps and rubella and rubiola here, these are childhood type diseases and we would not routinely give this vaccine to individuals without first checking their seriology. And, it so happened in our Apollo 14 crew all of these individuals possessed immunity to those three illnesses and none of them had to receive this vaccine. They already possessed that immunity - we found out from our seriological survey. Next, please. Now -

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BERRY Now, we mentioned the crew medical care area; the immunization area we talked about. Now, let's look at the other part of the program, here. This big block here, which is the foundation stone of all this thing is the thing that's the most important factor in the whole thing. We can write any kind of a program. We can try and implement anything that you want to say, and it isn't worth a damn, if the guys that are involved, including crewmen, families, and primary contacts and management at all levels, do not emphasize this thing of individual motivation integrity. Because we have no police system. We have no policemen who are looking around and saying, are you doing this sort of thing? These individuals have to want to do it and they have to do it and they have to report these things to us and without that kind of reporting, the system is dead. I'm amazed, as a matter of fact, at the attitude and cooperative attitude, of the crew in this regard. And I'm totally amazed even more so at the number of people who had - each of the primary contacts has had to sign a form that he is willing to become a primary contact and that he understood what was required of him. Just as we've done in the LRL. When we have people who are in that situation. And these individuals are just fantastically motivated, and they're looking all the time for holes in the operations that are going on at the Cape. And we've had several sessions down there in the last couple of weeks where they're finding things that we have to do something about because they say here is a procedure where we're going to do this now. Obviously, we can't do it this way because - don't you agree with that, and they're right, so everybody is trying with this thing, I think, very well at the present time. Nobody has been locked up yet and the proof of the pudding is when they start playing the game for real on Monday morning. Now this will produce minimum contact, then, with a group of people who are primary contacts. You must realize also, that the crew are not going to be exposed to all 160 of those people at any given time. I mean, there are peaks and valleys and those are people that are potentially - that they potentially have to be exposed to. Obviously any day that they are in the trainers they're exposed to a number of people in that trainer who are primary contacts. And so those are the kind of people they will have more exposure to than anyone. The rest of the individuals are sort of like peak and valley sort of thing, depending upon what the situation is, and we hope during the last 5 days, because there are many things that have incubation periods very short, like 24 hours, 48 hours and things of this sort, bio-type things that we would like to cut that down even more in the last 5 days in numbers of people to whom they're exposed and that is the plan. Now, the contacts surveillance type thing is what I've already discussed with you. How that's being done and reporting by the individual. Immunization and medical exams and the air filtration has already been discussed

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BERRY with you. That's the last viewgraph, isn't it? One more? Okay then, let's see the last one. Oh gosh, yeah. The most important one. Well, now. What happens to the crew? Where do they go and what do they do? The crew quarters area, which you're familiar with in the MSOB at the Cape is one of these areas that has the changes made in the air conditioning. And the prime and the backup crew will live in this area for the 21 days starting at 0630 on Monday morning. That's their home. Now, they have to go to certain other areas to do things during this pre-flight period. One of the places that they'll spend a lot of their time is in the flight training building - flight retraining building. One of the original plans we looked at was building a building and attaching it on to that and locking everybody up in this one thing. And that was seriously looked at after the Apollo 13 incident. It was decided that that couldn't be done and so we're doing this plan as we have here. What's happening here is that the transition from here to here is done in the following way: there's a dedicated stairwell at the end of the building at the Cape. On the end of the building that is near the crew quarters, and that stairway is completely blocked off. All doorways into that except from the crew quarters. The only people who use that would be the crew. And the crewman would then exit the crew quarters; he would go down that stairway; there's a marked off parking area that is roped off right outside that door. The - there is a security guard there. The crewman would go down and enter his car at that point in time, he would drive from the MSOB to the flight retraining building where there is another roped off area on the side of the building, and there is an entryway there where he goes in and all the flight crew training building is not controlled. There is, as you look at the building from the MSOB and from the entry into that building, the left half of that building where is the side of the computers and office area over there that is not controlled and it has totally separate air conditioning and so forth. There is a place where any interviews that are held, or briefings that are held with the crew from Monday on will be held in this building and there is a room in the front part here that's much like their briefing room over in the LRL, where they're separated by glass and separate air conditioning and everything, from those individuals. And that's where these things will occur is down there. None of those will occur in the crew quarters. Now this area then, around the trainers, is controlled and it's an area about like that of the building that has controlled air conditioning and they spend their time in there and everybody that's in that area is a primary contact. Now people can come in and work on those trainers at a time when there are no crewmen in there. If we needed to do anything on those trainers, like at night or something, you could have a shift work in their and those people would not be primary contacts. There has to be at least 1 hour of clearance time of

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BERRY any area like that prior to the time that the crew would enter it, because we have bacteria filters and if you had an hour clearance time from the air flows - we determine the air flows in every one of these buildings in these areas, and we know that you would have sufficient clearance of any organisms within that period of time and that it would be an acceptable thing as long as we had an hour clearance, we could get them into an area. Okay, there is a hand ball court that is on the fourth floor of the MSOB that they will use. There's a medical area that's down the hall on the third floor of the MSOB. And they have to transfer - they have to go down a hallway to get there and they pass through an area, for instance, they go by the ace rooms there on the third floor where there's a positive pressure in the ace rooms and the people in the ace rooms are not under the primary contact control and there's a lot of air outflow. They will wear masks when they go down that hallway. They will wear a mask in transition from the crew quarters to medical area and back. They do not have to wear it while they're in here or in here but they do in this transition. The same for the hand ball court, again. The handball court has separate air conditioning, it has separate bacteria filters, but the transitioning to it, the hallways and so forth, are not. Now the hallway will be cleared by a guard before they go down any hallway. Now, it's very important that we get this kind of information out to people, because we don't want somebody running up when they see an astronaut down here trying to get into his car and go into anyone of these areas and run up and say, "Hey, how about an autograph, ," or something because what we ought to do is have a high powered rifle, I guess and pick them off as they do that, or something, but we're not in that position and we can't do it. So as a result, it evolves upon everybody understanding that you stay away from the crew from starting Monday morning, number one, and secondly, from the crew than have to say if somebody doesn't do that they're going to have to tell them that "we're lepers, stay away." Now, the pad area is a fairly controlled area. We have some people there who are on the primary contact list. A small number of those people. There is one spot there where we're going to have to do something special to getting into the LM, Because while the command module area is specially controlled, the LM area has some air conditioning that is shared with some, I think, it's 64 people, and as a result, the individual during CDDT who has to go into that area, the crewman is going to have to wear a mask in transitioning the gantry, getting into that area. When he's in there he's alright in the LM, then transitioning back out. Now, on flight morning it doesn't matter because he'd never have contact with the crew again, anyway, after that time. There is the crew beach house, which is controlled and will have only primary contact areas out at the Cape. Now, local flying is handled by a single flight crew chief, who is from here, who will be located at the Cape and he

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BERRY will - he is a primary contact. Any filing - all the filing will be done by phones. There is no contact with anybody at Patrick at all. Transition will be done by car, and they will enter the aircraft and fly locally. Should there be an emergency of some kind, and there are no plans at the present time to have any return to MSC by the crew, after Monday. Should something happen that we had to return the crew here for some reason, what will occur is that that we would have them fly - they would fly from Patrick to Ellington and, again, it has to be done - it couldn't be done on a day like today, when there's weather involved, because the chance that they might have to not make it because of weather. So that can only be done in absolute conditions where there is guarantee that, except for aircraft -

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BERRY - - conditions where there is guarantee, except for aircraft failure of some sort, that there would be no stop. In arriving here, they'd be picked up by security, and they have an option which is open to them. They can stay in the LRL as they will postflight or they can, if they so elect, they could stay at home with 24 hours before the house would be cleared of children. The only person who can stay in that house is a wife, and there will be a security guard there to make sure that nobody else does enter the house in that period of time. And, so there would be a 24 hour clearance period prior to that time. There will be no contact with children. And, they would then come to the MSC trainer here which would be the only reason to come back here and we don't expect that that's going to occur. Okay. I think that's all of that. Now, you're going to see a lot of - You might put those lights on - You're going to see a lot of these signs that are up in various places, and they'll be changed frequently. There's a whole bunch of these. There's some of these that are Johnny Hart type signs that we've had him do. There are a bunch that were done by MSC artists, and so you're going to see these placed around in strategic spots at the Cape and some here also so you'll know what's being talked about when you see some of these things. Any of you want to look at these. They are almost worth a book of their own just to look at some of them. They are pretty good. There is a summary of this program that has been written up that covers about three pages of release statement - news release statement. There also are a series of briefing chart things that we can get for you that you might want to have. I don't know - for a background, and if you do, we can get that to you, too. Now, let me say one more thing and then I'll open it up to questions in just a minute. Now, the other two things that I wanted to say is (1) you know we are conducting postflight quarantine on this mission just as we did on 11 and 12. You remember that we went to the interagency committee and asked that we not conduct quarantine again following our results. The interagency committee agreed. The Academy of Sciences did not, and we started out to conduct a quarantine on 13. We didn't do a lunar landing and therefore we didn't have a quarantine. On this flight it will be done the same as before except that we have made one change. Because of the projected long time that the crew might have to spend in the mobile quarantine facility aboard the carrier because of the landing sight, and we have made a modification to the mobile quarantine facility and we've put a double airlock on the end of the mobile quarantine facility. And, after the crew entered that on the carrier in the normal way that it has been done on the other flights, after 40 some hours - We're not quite sure - It depends on steaming time

BERRY and this sort of thing, but around 40 hours, they will be close enough to Samoa. They will steam toward Samoa rather than toward Hawaii. They will be close enough to Samoa that we can then have the crew exit the MQF into the first airlock where there will be a change of clothing and a respirator - a vatro respirator - as they came out of the original spacecraft. This will be a total new set of that. They will shed their old clothing and leave it in the MQF. The airflows are such that there is negative pressure in the MQF. There is a little less pressure in the first airlock, and a little less negative pressure in the second airlock so that the airflow is always into the MQF. Nothing coming out. They will then - after they have on this clothing and respirator, they will close that hatch and they'll enter the first - the second airlock on the way out and close that hatch and then they will open that door and exit that walk to a helicopter that is standing as close as we can get it to MQF. They will enter that helicopter with their mask and this clothing on and will be flown to Samoa. There's a C-141 sitting at Samoa with another MQF on it. They will pull the helicopter up to that aircraft as close as they can and they will exit the helicopter and enter the new MQF at Samoa and be flown - and, there will be a refueling stop at Hawaii - Then, they will be brought on back here. This makes a difference of about some - oh, roughly - 5 days, I guess in the time that they would spend in that MQF in getting them back here. That's the only change in the quarantine plan. There's one other series of changes that are occurring in that we are doing a number of things in the medical examination area this time that we have - most of which - we have done on previous flights in some form or other. We are combining all of these things on this flight because, as a result of what we have seen thus far and what we have held in discussion with the Russians from the Soyuz 9, we feel that there - we have some theories about some things that are occurring here and we want to try and get every bit of information we can to add this up. So, we are doing some examinations this time that involve looking at fluid shifts within the body and combining this with our determination of, using a determination of exercise capacity and our cardiovascular status to combine all these at the same time so that we have a better and clearer picture of this, and that's something that hasn't been done before and will be done on this flight. And, I think those are the only changes that I'm aware of that we have. I guess with that, we ought to open up to questions.

QUERY Chuck, do these new medical isolation rules rule out presidential dinners in crew quarters, dinners with high management, or otherwise officials at the cape, or hasn't that tight rope been walked yet?

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BERRY Yes, it has been walked, and it does rule out. The only individuals who can have contact with the crew at all are people who are on that primary contact list, period. And, there are no political personages or anyone of the sort who are on that primary contact list. Not even the director of - the administrator of the agency is on that list.

QUERY You just answered the question I was going to ask, but how - I'll put it another way - What administrative type people are on the list?

BERRY We've tried to not have any of the administrative type people on the list. And, to my knowledge, I don't think there is any administrative individuals on the list. Deke is on the list because he's serving as the crew coordinator this time, and he's doing that job at the Cape. So, he is a primary contact. In that sense, if you want to consider him an administrative guy, he is on the list.

QUERY (Inaudible)

BERRY Yes.

QUERY Will the children be attending school regularly?

BERRY Yes, they will.

QUERY What about the contact with the mother and then onto the astronaut? Is it very likely that this could occur?

BERRY That's one of the holes you're pointing out right there, and that's the hole in the whole primary contact system that worries us is that the primary contacts all go home at night, not just the problem of the mother here. Now, it's doubtful as to whether there will be contact. That's going to be an individual situation here, but there may be no contact with as far as the wives or families are concerned, anyway. But, they certainly are going to have contact with the guy in the trailer, for instance, and some of the other people on this list, and everyone of those people go home at night and have contact with their families. And, that's why this information - this surveillance system, and this base line data thing and knowing what's happening in the schools and the local area and everything is vital to us every day. It's a difficult thing. It's a big medical load we've taken on, and it's going to be a day that there will be a problem a day. In fact, so far we've had about 10 a day.

SPEAKER Peter Mosley.

QUERY Can you give me an idea of what sort of exposure would bring about postponement?

BERRY Oh, gee, I wish I could tell you that. I think if it were just exposure - Now, you realize that that's what happened with 13 was an exposure with a known illness. We knew that the individual didn't have immunity. As it turned out, that individual did not develop that disease.

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BERRY Now, the chances that we felt were about 3 out of 4 that he would, and he happened to be the 1 out of 4 that did not. Now, he has since been immunized. Now, in addition to that, though, you would have to look, then, individually, at the situation as to what the exposure was, and if you knew the exposure and the timing of that exposure, and you knew that there was something - For instance, let's say that it was something that you had no immunization for. You couldn't have done anything about it from an immunization viewpoint, and therefore, the individual is susceptible. You don't really know how susceptible. Then, you have to look at what the consequences of that particular illness are and what you know about it's incubation period and that sort of thing, so it's a very complicated sort of thing. I don't know any way to make a general ground rule, and we haven't set up a set of mission rules that say if A happens, this is what we are going to do. I wish we could, but it's going to be a day-to-day kind of determination.

SPEAKER

Jack Strickland.

QUERY

Chuck, will you discuss a little bit this theory business about Soyuz 9 (garbled) American astronauts. You say you have some theories and going to run some tests. Will you go into some detail on what kind of tests these will be and what you hope to prove or disprove by them?

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SPEAKER - go into some detail on what kind of test these will be and what you hope to prove or disprove by them.

BERRY Well, it would take long time to do that. I'd be willing to talk to somebody about that. Let me summarize it for you in this way, and say that the Russians had results which were far worse than our results for a four day difference. We have been observing some changes as you know. We have seen some things occur in our flights which we have observed on the four eight and fourteen day flight. We have repeated those observations in the Apollo program and are convinced that a lot of these things, like the cardiovascular deconditioning we're seeing, the loss in exercise capacity that we're seeing, that these things are definitely weightless related. And they're not a problem with confinement. Now, in addition to that, and a calcium loss too, we have seen some indications with the weight loss that we're seeing and with - there are some fluid balance changes and we've never been able to really get a hand on these with people being in the mobile quarantine facility postflight. For the first time we were able to collect good postflight urine samples and to get some postflight, continued postflight blood samples. Because if people were captive in that sense and it was very easy to collect 24 hour urines in that kind of a captive situation. So we have done that, and as a result the indicators are, looking at some of the hormone level change, we think, we're trying to get a mechanism. We're trying to find out why the things are happening that we're seeing. And if we can correlate these things by doing them all at one time. And for instance we're going to look at intracellular fluid, extracellular fluid, and intravascular fluid, all at the same time in short. Total body water, we're going to look at the plasma and red salt volume. The whole bit, all those things combined this time and in conjunction with the physiological measurements we're making. And we hope that that will give us a clue to looking at the loss of potassium we've seen from the body, we're seeing some potassium depletion, as a matter of fact, we think that's the sort of thing that luckily man handles that well, animals do not handle that very well.

QUERY Chuck, it would seem that you've taken on an extra medical load here, somewhat akin to caring for a small village or town. Have you had to add extra doctors or have you formed a bar for Berry astronaut relief force or what?

BERRY We have a large number we haven't taken on any extra doctors. I wish we had some, but we do have a number, we've taken on some extra epidemiology people and some extra laboratory people. We've had to do that because we have a tremendous laboratory load here, fantastic laboratory load. And this information is coming every day. We have a computer line setup with the Cape, so I have that

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BERRY is happening here as well as there and it's all in the same line. So we do, we have taken on a big load you're exactly right, but we haven't had to add extra physicians in doing that so far.

QUERY How many technicians and technologists have you added, roughly?

BERRY Bill, you back there. What do you think roughly? 12 or - roughly around 10.

QUERY I've got two questions, Dr. Berry. Why are the children excluded from the primary contact list? And what was the primary reason, the precise reason the academy gave for continuing with the quarantine?

BERRY Okay, to answer your first question. Children are probably the most frequent source of disease and the most difficult one to control, because they're more widely exposed than anyone else in a school type situation. And this is an impossible thing to try and control. Now, a mother in that situation, you'd say well gee why should you even let the mother. Well, there is a question about that except that a mother tends to have some immunity that she's picked up to some of things that a child brings home. And so while it isn't all pure certainly we feel that the children are such a source of disease that it could not be done, no way to do that. No rational way to accept that. The Academy's reasons for continuing a quarantine really was 3 basic reasons. One reason was that they said that they were not convinced in spite of the arguments of some of the geologists here at the center. They were not convinced that we had indeed been exposed to highland material, and that we were going to a highland area in Fra Maura on 13 and now again on 14. So it was a new type material that had not been sampled previously. We were going to a new depth, you're digging in a new area and you're going to new depth. And so here was a great possibility of digging up an organism that had not been seen thus far. And lastly, we had seen biological change that there were two biological changes that were noted as a result of lunar material. One of these, the effect upon bacteria, and the other one, the effect upon plants which has not been totally explained as yet. And therefore, they felt that we had to continue that quarantine. Now, what's going to happen to the remainder of the lunar missions I really can't tell you.

QUERY First of all, Chuck, congratulations you are going to be named the salesman of the year, I'm sure. But is this being held on individual basis by the crew members or is one handling it for the whole group.

BERRY I don't follow exactly what you mean.

QUERY Is one crew member got an assignment of health collateral duty or kind of a health officer or is each reporting to you.

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SPEAKER Each (garbled) Yes. Each reports individually. They report what they do now. We have a what we call a medical surveillance offices, that phone is manned 24 hours a day. And they can call there. They either contact Deke or myself and I'm sure they'll contact - because they are with Deke. Most of the time he's going to be down there, 24 hours a day too. And so anybody that we're taking off that list is a thing - it's an agreement between Deke and myself. We inform each other of what we have in the way of findings and something will happen that the individual be removed.

QUERY Under the bonds of your Hippocratic oath how is it working out the crew?

SPEAKER Well, seriously Paul and I guess you know better than anybody else some of the problems we've had here. I am very - I wouldn't have given you a plug nickel that this thing would work and it's really quite amazing to me the attitude - the really cooperative attitude of this crew. And they - we had the best crew briefing I guess we've ever had on Monday with these guys and there are some additional medical procedures here that are being done as I mentioned too. And we had a really tremendous crew briefing and I think, I really think, they all understand what we're saying and I think they really want to do this and the people at the Cape impressed me very greatly too. Their activity in this area is just short of unbelievable.

QUERY Chuck have you had any reservations or voiced any objections to us meeting with the crew tomorrow?

SPEAKER You meeting with the crew tomorrow?

QUERY This soon before the thing?

SPEAKER Well, we've been through that little thing before and I guess you know you have to set a time limit some time and we set 21 days and so there's no point to try and you know, if you had, you're way, you'd say well gee you'd like to go further and, of course, you probably would. But I think that you have to do that sometime and I guess we certainly wouldn't want it done any later than tomorrow. And so that's - I have not voiced any objection to that meeting tomorrow.

SPEAKER Ladies and Gentlemen we're fighting a real time problem here and so we have time for two more questions, then we'll break.

QUERY When you tack this isolation preflight on top of the postflight quarantine ~~and the flight itself,~~ ~~do you~~ add something to the crew susceptibility after they come out of the LRI

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SPEAKER Now, that's a very good question, Ed. I'm glad you asked that because you do. It's quite obvious that if you separate an individual from his normal exposures to organisms you render him more susceptible than to those same organisms when he is exposed because you lower his immunity level. Now that's exactly what will happen here. Now that happens normally to us on a flight anyway. I think it's terribly interesting that the SOYAS 9 crew had postflight - they had a postflight isolation quarantine very similar to what we do in the lunar receiving laboratory but they didn't have any lunar mission. They did that for the so called bacterial shock theory. The same thing that we're looking at

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BERRY - - theory, the same thing that we're looking at and of course we have some great concern about the skylab missions. And we're looking very hard at this whole area in the skylab. Now the thing that we are doing here is what happens to us in our LRL situation. See they still will have some contact and they'll be getting some exposures to organisms because of these primary contacts. So they're not totally isolated. The only total isolation period they have is the flight duration. And that is totally isolated with the organisms among those three individuals. Then, they come back and we start reexposing them again in the LRL. We get a few more people exposed to them in the LRL and if somebody breaks a glove they'll get a few more exposed in the LRL. But there are few people that they get exposed to so they get a gradual exposure in that sense. And it is a problem to look for to the longer duration missions that we're considering very seriously now.

QUERY Dr. Berry, I'd like to ask a couple of questions about Al Shepherd's ear. Is he completely cured from his problem and if for instance, you had a cold in space, like they had on Apollo 7 and of the danger of plugged up ears during reentry, would this operation that he had make it even more difficult on him if something like that happened?

BERRY No. I'd have to have an anatomical model to make that clear to you I think, but his problem now, as far as the latter part of your question, let me say first. His problem is - involved the inner ear, so it involved - now if I use terms here you don't understand somebody yell, but it involves the cochlea, which is the portion where the hearing mechanism is. It's where the cells are that pick up hearing, there is a fluid called endolymph that circulates inside that and it's a thing that looks like a seashell. Connected to that, again a fluid type system in there, are the semicircular canals, which are, in essence, the semicircular canals represent or could best be called angular accelerometers. They tell you motion at angles. The otolith is there which acts as a linear accelerometer and also as a gravity sensor and as a filter for inputs on the semicircular canal. Now the theory of Meniere's disease, the best theory that has been shown fairly well now by anatomical evidence and a great deal of study in the last few years is that, this is a condition that results from a lack of adequate absorption of this endolymph fluid that is produced and you may be familiar with glaucoma, which is a disease in the eye, which is a condition similar to this in nature, and again it's an inadequate absorption of this fluid as one type of glaucoma. This fluid is produced and if the pressure builds up within this system, what happens is you first lose some hearing, cause those are

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BERRY the most sensitive cells and so you get some decreased hearing, you get some ringing, which can be associated with them, and that may not clear up, as a matter of fact, and then eventually the pressure builds up also in the semicircular canals and you can get ataxovertigo. That's what happened to Al, initially, and that's episodic that it - you get episodes of this sort of thing as the pressure builds up it is relieved. They have seen some permanent relief of this thing by actually growing a hole in one of these areas, and therefore, permanent relief. I mean it builds up and blows and then they have no more problem with this. A so-called spontaneous cure of this thing. As a result of operation was developed which literally puts in a relief valve and that's what this is. It's a tiny tube - I meant to bring it over here today, but it's a very tiny tube that is placed - and it's an operation of going through the mastoid and you place this tiny tube into the saccule make a slit, put it in there - it's done under a microscope and then this is - you drill a hole directly in this way and you have the end of that tube then go into the cerebellar pontine angle here. It's a fluid space that a fluid - that through the spinal fluid surrounds the brain. And there is an area - a well of fluid in there. And so this tube projects into that area - projects in far enough so that you don't get any (garbled) adhesions around it or anything and it acts as a relief valve so that any time that pressure goes up in there - should it ever build up - it's equalized the cerebral spinal fluid pressure so you have a permanent relief valve. So you should never have this difficulty again. Now that's as far as the condition itself is concerned for relief. The second thing here, of course, is do you stand a chance of dislodging this or something by anything that's going to happen in the flight. And of course, that was a concern on our part early in the game. So before we did anything here we went to great lengths to know the specific gravity of this material, to know that it was nearly the same as tissue that it was involved in and therefore, should not be dislodged by acceleration or anything. We then exposed Al with tests before and after, exposed him on the centrifuge to launch and reentry accelerations the same as will occur on the Apollo flight. This has been done some four times. With absolutely no evidence of difficulty what so ever. We then exposed him to a fantastic number, I can't remember the number it's so high, of zero g parabolas. And we've had no change at all with that. We then exposed him in the altitude chamber and the pressure suit and no change with that. We've had him flying high performance aircraft in this period of time and no change with that. And therefore, I'm personally convinced and obviously I am or I wouldn't be doing what we're

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BERRY doing and we have said that he is qualified to fly. I feel that's my job - to qualify people to fly who are able to fly, from a medical point of view. Now whether they get put on a crew then after that, is a second kind of consideration. But any guy from a medical point of view has a medical abnormality of any sort, our object is to try and get them to fly, just as we did with Mike Collins, or any of the other individuals. And that's the object we ought to have, if it is possible to do that safely and it's not a hazard to himself, or he's not a hazard to others in doing that.

SPEAKER Let's do it this way, Dr. Berry will be available outside for any individual questions. We have to go with the next briefing. I'm sorry. Dr. Berry, thank you very much.

END OF TAPE