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PARTICIPANTS:

Dr. Charles A. Berry, Director Life Sciences, NASA Headquarters
Bob Gordon, PAO

DR. BERRY PRESS CONFERENCE 4/28/72

PAO Okay, ladies and gentlemen, Dr. Berry, I'm sure, needs no introduction to all of you, so he'll just start, and then we'll have question and answers, and please wait for the mike.

DR. BERRY Well, the first thing I ought to say is everybody I tried to get ahold of this morning is on leave, and I don't know why you all aren't and I'm not, and you all look as hung over as I feel. (Laughter) Okay. I think we ought to run through probably what we have back in the way of data and give you some figures that we know at the moment, and then try and summarize where I think we are. I think the first thing I would to say is that you obviously realize that anything that we say here is preliminary kind of data because we're getting it by very rapid means, and we got some holes in the things that we're getting, and we're not in a position where we've been able to ask all the kinds of questions that you'd like to have asked to pin the details down. So we're going to have to continue to work on that and obviously when we have the - after we have the crew back here and finish the exams on Sunday, we'll have a lot better idea of having pulled something together, and we won't really have it until we finish the medical debriefing. And I think you're all perfectly aware - four and yes.

SPEAKER Yes and four.

DR. BERRY Okay. With those provisos, we got weights on the crew. The commander lost 7 1/2 pounds, the lunar module pilot lost 5 1/2 pounds, and the command module pilot lost 6 1/2 pounds. I think you knew the weights pre-launch and postlaunch. I've got those figures if anybody really wants that kind of detail, we've got them and we can give them to you. Okay. The commander went from 174 to 166.5, the lunar module pilot from 161 to 155.5, and the command module pilot from 135.5 to 129. Okay? Now, when they were first seen on the carrier yesterday, they were and they felt - said that they felt excellent as they were reporting from the spacecraft. They were fatigued; they were hungry; and they were thirsty. And they were described by examining physicans as being euphoric, very happy with what had happened. They could walk well. And there wasn't any obvious effects of orthostatism or the inability to stand up well without having blood pressure drop. There was no obvious impairment with this. And I think you saw one of them run, I guess it was Charlie who ran - ran into the examining area, so it was pretty obvious that there wasn't any problem. And another thing that I think is of interest to all of you, there was no motion sickness reported by any of the crewmen even though they were perhaps some 30 minutes in the spacecraft, and what looked to be as we were watching it on TV a fairly up and down sea. The working conditions out there aren't too good right now. The air conditioner ran out and so in the examine areas, well, the temperature has been going up constantly, and so I'm not sure what that's going to do to us because there aren't any air conditioners out on that ship right now. And that's not going to be too good for any of us,

just as some background dope. Okay. Let me, then, tell you where we are with the rest of the physical exams and then we'll go on from that point to summarizing some of the things we saw and what we think it might mean or not mean. We did have in one of the crewmen in John -- now, I don't know, is anything come off the carrier? I - I, have you seen anything come off?

PAO Not this morning. The last thing was last night.

DR. BERRY Okay. Okay. I wondered --

PAO Just generally quoting Dr. La Pinta, they're in good shape.

DR. BERRY Okay. We had in John, we had some fullness in an ear and some plugging of -- minimal plugging of one ear on reentry, and this is not -- we've seen this on numerous other crewmen. That was the only thing that was really seen on him with the exception that all of the crew had some irritation around sensor sites on the skin. Some irritation around the sensor sites on the skin. Now you know that this irritate, we feel that the business with the -- that involves the nasal, the nasal mucosa and the sinuses, you hear that in the voice transcription things we feel this is a response to the oxygen, and we see it fairly commonly on the flights. It sounds like they're hoarse, like they're plugged up, you hear that frequently. And then sometimes when they do reenter with this, they end up with some plugging of an ear. And we did have this. It's of no import to us and it responds very easily to some decongestant and there's no problem to it at all. Okay, I think that covers really on the initial physical -- that pretty well covers that. No, as far as the detailed exam -- we don't have a lot of the lab data, of course, as you know we do collect the lab data there, but a lot of it isn't run until we get back here. We do only initial counts there, and inital urinalysis, and these are -- these are not the detailed kind of things that we are trying to get the data on here. And they are more clinical determinations than anyting else. One thing we did see though is white blood cell counts on all three of these individuals that are well within the normal range and do not show increases as we have seen on previous flights. And all these blood cell counts are perfectly normal, ranging from 70 -- like in the range of 7300, 6850, and 7700 and the distributions of cells is all perfectly normal. And so there's -- that's a difference normal -- we have seen some fairly marked increases in white cell counts with an absolute neutrophilia increase in the neutrophils, we don't see that in any of these three crewmen.

QUERY This the first time?

DR. BERRY Yeah, you just don't see that here. We felt that was a stress phenomenon, and it's sort of interesting we don't see it here. Now, on the tests that are of primary importance to us, I guess the first thing

we ought to say is that on the determinations of potassium and the urine that was obtained in flight, and so forth, all those samples we are trying to get off of the carrier and in here won't -- they won't arrive in here until about 4 o'clock on Saturday tomorrow afternoon. They don't leave the carrier until midnight tonight. That's apparently the first flight that we can get samples on to get back here. That means that it takes 24 hours following the initial administration of the K42 to follow the urine output of the K42 in order to get a first number. And you have to get that urine, that takes 24 hours, and then it takes you about 48 hours to look at the decay in that urine. So it'll take about 48 hours for us to do that. So it'll be -- if we get that tomorrow afternoon late, it'll be tomorrow night before we have the data that will allow us to -- to have even a first cut at the number. There is some decay time after that depending on the K42 itself to have a final in the absolute numbers. So there is several days involved here, and obviously that's why I say this going -- anything that we get there is going to be very preliminary. Now as far as the crews' response to the two tests that we have been most interested in following the bicycle ergometry and the lower bodynegative pressure, we did see with this crew and the -- both of these tests they are in some better shape than the 15 crew was. They looked more like 14 crew data as a first look. They looked much more like the data from the Apollo 14. Now, they don't look the same in the sense that there was a difference between the lunar surface guys and the one in orbit. They all looked pretty much in the same ball park in this thing. And so it's the kind of data we saw prior to Apollo 15 in general. And let me more specific about what that means to us. For instance, in the area of response to the bicycle ergometry, it looks like there's somewhere around a 20 percent deficit in their workload related to -- and oxygen consumption related to heart rate. So they've got about a 20 percent drop as an average figure. On Apollo 15 these percentages were 20, 30, and 44.

QUERY What mission was that?

DR. BERRY On Apollo 15. There were 20 on one crewmen; 30 on another crewmen; 44 on another one.

QUERY Do you know which was which?

DR. BERRY I don't remember which was which.

QUERY (Inaudible)

DR. BERRY They were mixed. It wasn't divided that way. They were all mixed. Now, as far as the -- so that is better here and on the lower body negative pressure, it appears that there -- there is an -- it runs somewhere about 20, about a 20 beat increase or delta (I want to be positive about that now, I don't want to give you some bum information. I'm pretty sure that's right) Yeah, about a 20 beat increase in heart rate above what we saw for an increase. Like if we had seen, for instance, you run something like at resting heart in the LBNP you realize that we

take them for 5 minutes at absolute rest, and then we go up to 30 millimeters for 5 minutes; 40 millimeters of negative pressure for 5 minutes; and 50 millimeters of negative pressure for 5 minutes, and then we go back to a 5-minute recovery period. And we're taking blood pressure and pulse rate, and the pulse rate is a better indicator here, and a typical response would be running somewhere in the 50's, mid 50's, say, in that 5-minute rest period and by the time you get up to 50 millimeters negative pressure, you're running a heart rate, say, in the mid 70's. So you got something like a 20 beat per minute increase. Now what we've seen here is another 20 beats above that, so you're running up into the 90's here, is what we're seeing now. We saw one of the higher ones that we saw we've seen on Apollo 15 where we got up to some heart rates that were up well above a hundred. We got some that looked like one that we saw way back in Gemini got way up to about a hundred, I think he got up to something like a hundred and forty. So, that's a fair -- what that says is that the thing that we're seeing here was -- is milder than and it's consistent with our previous flight experience prior to Apollo 15. The other thing that we might tell you is that we got a halving of this increase in pulse rate and short where we got 20 beat delta with the lower body negative pressure if we put the leotards on one man as we were going to do on Ken. We put leotards on them for one of the tests, and that decreased -- that cut this in half. So he got only a 10 beat increase when he had the leotards on versus doing the lower body negative pressure without leotards. So it is protected in that sense. And that's an interesting data point to us. It is a single data point, but it is interesting to us and helpful. Okay. We don't know details at all about trying to put into final figures any of the intakes and outputs. Let me tell you what we are trying to do in this 3 days. We are going to try and control the dietary intake in the 3-day period we have right now so that it will be similar to what they did during the last 3 days of flight. Now the reason for this is that you would liked the potassium determinations and all the biochemical determinations and particular, potassium, sodium, and so forth, to represent what's really happening to the body and not as a result of dietary intake. Cause if we had big fluctuations now on intake, it could be strictly on a dietary basis and not related at all to anything that is happening to this adjustment process. And so that's the reason for having to do this. So we're trying to balance that during this next 3 days, as I'm sure you've seen in the medical requirements document. We will be taking intakes and outputs during this period of time and all of these data will be analyzed as they become available to us. Now, looking back at the data in flight, I think we said this once

before, and we ought to say it again though, that -- about the best thing we can say at the moment without having the inflight urine for calibration, and you realize that we will have an inflight urine which will give us a zero-g calibration of that technique of timing per volume. And without having that data available to us at this point in time, we can only say that we didn't see any gross diuresis, we didn't see any gross volume diuresis, in short, any large increase in urine volume from the determinations that were made in flight. Realizing that we have a 5-hour period unaccounted for from the time that they -- until they got the suits off in orbit. And so if they lost an increased amount of volume of urine in that first 5 hours prior to the time they got the suit on, we can't -- we won't know that yet. And we're still trying some techniques to try and get at that, but I don't have very much hope that we're going to be able to really pin that down. So we have a data point that says to us at the moment, no gross volume diuresis; I think we'll have a better handle on what that means to us when we calibrate this one in flight urine and when we look at the content of that for potassium to determine whether we really did lose more potassium or not. The heart -- the X-rays that we were taking for heart size were all done very well, and it appears on just first looking again without having calculated the volumes in detail, we do have decreased cardiac silhouette size, we don't have the volumes calculated yet in detail obviously, but at least they followed along the same things that we have seen on previous flights that there was a decrease in cardiac silhouette size. As far as the radiobiology is concerned, we saw what amounts to about a half of a rad in dose, which is insignificant for the entire mission, and there was a small solar flare, I guess you all knew that, but that happened early in the mission, and there was some radiation recorded at the level that reached the spacecraft. But there was nothing that increased the crews' dose from that small solar flare. The light flash experiment confirmed pretty well what we have seen previously running all the way from a flash every 1 to 3 minutes. And they in the two times that it was done, and the one thing that we still have open to explain there is why Ken Mattingly apparently didn't see any. And that occurred on both instances, and we still don't have a valid explanation for that one at this point in time. Okay, I think that's about what we know at the moment, and I'll stop with that and let you, if you've got some other things that they want to ask, I'll be glad to try and answer them.

SPEAKER Well Chuck why don't you try to put the weight lose in prespective and maybe a few comments on whether you feel you controlled the -- this time the lose of body fluid I believe it is.

DR. BERRY Well I think this weight lose is you know it's sort of in the same -- our weight loses as you know in the past have run all the way from one individual him having gained a pound, most of the time the weight losses have run between a 2 pound loss and a maximum we've seen is a 14 pound loss. So these fall sort of in the -- in the middle of that ball park and there the kinds of losses that have been associated with in many of our -- of our Apollo flights and with some of the earlier flights in Gemini. So those I think that follows on very well with what we've seen in the past there fairly equaled in that there's no differences between the guy who was no mark differences here between the guy and zero-G verses the individuals who were on the lunar surface for short periods the kind of thing we saw with 14 in those differences does not apply here. It would appear in summary, the things that we have done thus far, for this mission have been helpful to us in putting the crew back into a state similar to what we saw prior to the Apollo 15 mission and whether it was all indeed the potassium or whether it was potassium and decreased work loads, better rest, these things we were all trying to do also. I don't think anyone is in a position to say at this point in time. I don't know that we will ever be for sure. Some of the things that will help us do that, of course is if we see -- get some confirmation of what we feel now in -- by lab data and see that indeed the potassium levels are up from what they were last time. Excuse me. So I feel that we are in a better state than we were decidably following at this point in time in the last mission. Now we still don't know whether these people are going to return within a given period of time -- a shorter period of time or whether they're going to have these -- just these level of decrement lasting for a longer period of time yet and that's going to take days to determine that. But predicting from what we've seen in the past you would predict that these will probably be returned to normal within a -- say a 72 hour period, something in that sort. Certainly 3 days or so.

QUERY You mentioned the solar flare, the experience early in the mission. Had that been predicted, would it have been a factor to stop the mission?

DR. BERRY No I don't think it would at all. It was a very small flare. It was picked up by the network. It was passed to us and it was a small one and the (garble) as it turns out was entirely negligible. Didn't do a thing to us. Would not have stopped it.

QUERY Chuck could you refresh my memory on why they go -- they have a deficit in the bike, on the bike and in the body negative pressure and the loss of heart muscle?

DR. BERRY Well I wish -- I wish I could tell you exactly why that happens, Stu, because I'm not sure that we fully understand any of those things. We think that this is a part of the adaptive process or the adaptation -- that word always bothers me, at least the adjustments that are occuring due to -- due to zero-G and that what we're seeing here then,

when they come back to the 1-G environment is a readaptation or readjustment to 1-G, building back uphill to where there physiology is -- is set -- where the new set point to live in this 1-G. Now what that entails is due to the -- to weightlessness of the blood. We get this finding of what has been

DR. BERRY call cardiovascular reconditioning, it's really a response of the entire cardiovascular system that it has -- showing that it hasn't had to perform at the same level to work as hard in zero-G state and now it has to when you come back here to the surface of the earth in 1-G and so you see a decrement. You see that it does create an increase in heart rate and we have seen consistantly an increase in heart rate and (garble) in blood pressure or what has been commonly called orthrostatie hypertension. Now we haven't -- that's varied as to whether we've seen symptoms with that and I'm not talking about symptoms here, I'm talking about using this as a stressor of that system. The same situation on the -- in the bicycle ergometry. We have consistantly seen this as a loss. As to the exact cause of that loss -- the exact mechanism by which that occurred, we aren't clear on that yet. We're looking at cardiac outputs and stroke volumns and things with that we'll have those data, but we don't have those yet. We will have those on this crew soon. And we have noted a decrease in cardiac shilouette and we're not sure whether that's -- some of that may be volume, we think some of it is probably cardiac muscle decrease. We think we get some decrease in muscle mass in the body. We have seen that in the mass of the thigh and the calf and that has been measured again this time. The Russians have seen that consistantly too and feel that we do lose muscle mass with -- as a part of the adapting to the zero-G state.

QUERY Larry Altman.

QUERY If you didn't have the diuresis that you assumed that you were going to get. How do you account for the large weight loss and what does this do to your theory?

DR. BERRY Well I don't think -- that's why I say, Larry, I think we've got some holes in the data and therefore, I and I think everything we've got to do, we've got to look at stools, which we don't know yet. And try -- because I can't say -- that's why I've been very careful to say looking at a gross volume diuresis, I think we've only -- all we can say is that from the numbers that we have we didn't have that. But to say whether there was a balance you know that would say that you really did loose more fluid than you took in. I can't say that yet. I'm really am not in the position to say that one way or the other. So I don't think it's done anything to our theory on that basis. I still believe that our -- our theory falls right back -- it's very interesting data and I think we've got to try and put that into our total picture and see if it does do anything to our theory.

QUERY Is it a surprise that you didn't see a larger urine volume to you?

DR. BERRY Well yes. I was surprised that we did not in the time period that we were able to get it. I -- I find it hard to believe that you could loose that within the first five hours and that's why I feel -- I think there's

some things we've got to still think out. I find it difficult believe you could loose that -- that increase in volume within that very first five hours of flying. Now this crew did apparently have some of the same feelings of -- you know all of the same adjustment feelings of the fullness in the head and so forth, that other crews have had. So that follows pretty much down the line.

QUERY Thank you.

QUERY Couple of things, Chuck. First would you kind of put into perspective what you think at this preliminary look at the physical condition of the crew is in comparison with 14 and 15? And secondly, with a dietary rigidity of these next couple of days, does that mean that Young's going to have to drink a lot of orange juice still?

DR. BERRY Well not necessarily orange juice, but he's going to have an adequate amount of potassium intake. And whether he takes that in orange juice or in other ways is -- we're not going to stipulate that. He can do it as long as we get an adequate amount of potassium intake to balance about what he was taking in flight. And there are other ways to take it other than orange juice obviously. And the other question was whether what I think was -- what -- to compare 14 with this and 15 with this crew. Well I -- it appears certainly from our first look at the data that this crew is better -- is in a better general state and are responding in a more near preflight manner to their tests than did the 15 crew. And comparing them to the 14 crew their -- their -- that's a hard one because the 14 crew was split and you had two people who were -- who had almost no response and you had one individual who responded pretty much like we had had other people respond in their earlier flights. So I'd say they responded much more like the one individual in flight. They're not at the point where they had no, no evidence of effect, which is what happened to the two individuals who were down on the lunar surface in 14.

QUERY Two questions on the light flash. Do you have any theories or spectulation why Ken Mattingly didn't see these things? And secondly, do you think it will be ever possible to find out?

DR. BERRY Ever possible to find why he did not? No we haven't really thought that one through yet. There are some ways, you know, we have done some -- some studies here on the ground out at Berkely, Dr. Tobias and his group has done some studies where they have actually put their head into a beam and had some kind of flashes. So I suppose it would be possible to find out if you could produce that sort of thing. I'm not sure that's worthwhile doing here I don't know that's it's necessary to do that, but as to why he did not when the other two did -- he's the only astronaut that we've flown in -- who has been to the Moon, who has not seen those. So a little difficult for me to explain. I can't explain it at all.

QUERY Chuck, I wish you'd clarify it a little better what you meant by this crew decreased work loads.

It seemed to me that they were working pretty hard considering some of the glitches that were coming up. And I'm pretty sure they had some better rest periods, for example resting in when they got on the Moon and resting after they got back in docking, but it seemed -- they were bouncing around on the Moon quite a bit too.

DR. BERRY They were, but the work loads -- if you look at the overall works loads for any given EVA, EVA-1 was the highest -- had the highest demand on this mission, but it's demand was, was less in the way of total exertion than what happened with EVA-1 on Apollo 15 and the drill that -- the difficulty that was experienced with the drill on Apollo 15 is certainly something that added greatly to the work loads on that particular EVA.

DR. BERRY Now the other thing is that this crew spent a lot of time on the Rover and the work load on that Rover -- now it appeared that the work load on the Rover even on Apollo 15 was higher than it was on the it was on this mission. Some of that probably because of getting use to steering and all that sort of thing and they had some -- they had some sort of wild rides there in that first -- first -- well I guess the first 2 EVA's. And I think they did make some fixes in the seatbelt things and so forth. And so that has -- was better and we saw some very low -- I mean the cost of riding the Rover -- the metabolic cost was just extremely low. And as you know, they had like on the third EVA the five hour EVA they spent better than half -- way better than half of that on the Rover. And so that cut their work loads way down during those periods, which was very good. And we did try and keep their total days -- the amount of work done in a given 24 hour period down considerably and that was much better than it was on Apollo 15.

QUERY Spending more time out of each station rather than lopping along --

DR. BERRY That's right.

QUERY making more frequent stops (garble) and so on and so forth helped a great too.

DR. BERRY That's right. Yes very much so. The total amount of work that you do within a given 24 hour period is the thing, because if -- if you load up that work and push it within a very tight time frame it does two things. It creates stress, which is one thing which tends to increase your adrenaline level, which causes you to lose potassium. And the second thing it does, it causes muscular attack, which causes you to pull potassium out of the muscles cells too, which is where bulk of it is. So both of those things are bad for you.

QUERY Are they going to be eating the same food that they had in the capsule on the ship to keep it as a control or you just controlling the (garble)

DR. BERRY We're trying to control it to caloric intake and the mineral content of it -- the electrolyte content -- potassium and so on. Actually, we didn't use the same inflight food in the preflight control period either. We used -- it's food that is similar to what we used in the MQF -- in the Mobile Quarantine Facility during the quarantine missions and it's prepared food and then which

is then heated. We had taken some comments from our pre-flight determinations that have selected some food to replace some of those items from the ship stores and those will be examined and analyzed in detailed the things we do take from ship stores. There's some -- for instance we replaced eggs in there I think because there was some comment about the omlets and so preflight and so we did replace that with some fresh eggs and still get an adequate amount of potassium.

QUERY Could you tell us a bit more about the sort of flare, Chuck, for further reference. For instance, how much morning did you get of it? How much -- how long would it would of taken the radiation to reach them? What would you have done about it if it had been a bigger one?

DR. BERRY It reaches them in an hours, Reg, it's a matter of hours -- we -- I can't not tell you exactly now I mean this happened early in the flight. And I don't remember the exact timing of this to tell you very honestly at the moment. But we had -- we had several hours warning, like something like 12 hours -- 10 to 12 hours warning something of that sort. The radiation -- now if we saw large levels of radiation reaching the spacecraft -- what you would do of course is you would try to keep them in the -- in the command -- you'd have less shielding in the LM and we know a LM dose versus a Command Module dose so you would -- if you were going to get a large dose you'd tend to keep them in the Command Module. And if that large dose was going to be at a time when you're going to be on the lunar surface you would evaluate how much of a dose you were going to get from that, you would evaluate whether you do the -- get outside, whether you'd go to the LM to go to the lunar surface to get exposed on the lunar surface too. And that's all been put into our mission considerations in the past. And we have some guidelines for how we do that, but we'd have to get a dose rate and a total dose, which is about at least 50 times what we're talking about here before we'd be concerned that way.

QUERY Was this the first solar flare during an Apollo flight?

DR. BERRY I think so. I think so. That we could get you an exact thing, but I'm pretty sure that's true.

QUERY So you didn't see any irregularities in the heart activity at all?

DR. BERRY Oh yeah I guess I should have said that. We -- yeah after all that -- geewiz. We did not -- there were -- there was nothing seen in the postflight examines that would cause us any -- any -- concern arrythemia problems at all. And then in the -- I think we've summarized for you the things we saw in flight. Actually, they were less than what we saw in preflight evaluations of the crew. And they were confined to premature aricular -- single premature aricular contractions or single premature ventricular contractions and I think the total number of

those something like 3 that was seen all during the entire -- the entire mission itself -- inflight and that's considerably less than what we had seen in the preflight evaluations during CDDT or the countdown demonstration or during the lunar surface simulations that were done at the Cape.

QUERY Three per man?

DR. BERRY No that was a total of 3 and I think they were all -- as a matter of fact I think all 3 those were in the same individual. They were all in Charlie.

QUERY According to the flares. Did you get -- it was already asked if you got some forwarning for those flares. Can you tell us the time of the forwarning? I mean it is very important if we have -- (garble) flares to get a forwarning in a reasonable time.

DR. BERRY Right. It's -- it was a matter of hours, Hanz, and I don't know the exact times as I said to Reg, I'm not exactly sure of the number of hours that were -- that were involved in the warning. But it was something of -- before we saw any dose rate it was something in the area of 10 -- 10 hours -- 8 -- somewhere between 8 and 12 hours. Something along in that sort.

SPEAKER We'll check that Hanz.

DR. BERRY We could give you a figure on that.

SPEAKER Jim, do you have a question?

QUERY Chuck, in just in very, very broad terms of health. Taking into account both the response to these tests, the lack of sea sickness, the affects -- lingering affects of inflight medication, everything like that. Are these guys in their onship condition, are they just about average or are they a little better than average than past Apollo crews?

DR. BERRY It sounds like they're probably a little bit better than average of past Apollo crews. And that's an guesstimate now because you know you -- that's a lot of things to put together and try and average, but it sounds like they're probably a little bit better than than average of the past Apollo crews, slightly better.

SPEAKER John, can you play the first part of that tape on the line? Okay fine. No well, put it on the line because some people missed it and they asked Dr. Berry to repeat it so rather have him repeat it, if you could put that part of the tape on the line that'll be it then. Any more questions? Fine. Thank you.

END OF TAPE

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