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SKYLAB NEWS CENTER
HOUSTON, TEXAS

CREW MEDICAL STATUS REVIEW
JOHNSON SPACE CENTER
AUGUST 8, 1973
3:00 PM CDT

PARTICIPANTS:

DR. LAWRENCE DIETLEIN, DEPUTY DIRECTOR OF LIFE SCIENCES
ED MICHEL, PRINCIPAL INVESTIGATOR, M171
DR. MICHAEL WHITTLE, M070
BOB GORDON, PAO

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PAO Ladies and gentlemen, we have Dr. Lawrence Dietlein, Deputy Director for Life Sciences at Johnson Space Center; Mr. Ed Michel, Principal Investigator for M171; and Dr. Michael Whittle will be coming in the door momentarily and he's the Principal Cognizant Scientist for the M070 series, Nutritional and Musculoskeletal Function Experiments. We'll start with Dr. Dietlein and get a general overview and then go to Mr. Michel.

DIETLEIN Well, at the medical management team meeting this morning we reviewed the crew's health status and at the present time, they're in excellent spirits and have no health problems that we are aware of, or no complaints. They're completely over the motion sickness problem that plagued them earlier in the flight. And they're presently eating essentially nominal menus as had been planned and have not been utilizing any of the optional foods that they could have eaten that were added to the menu yesterday. In general, the - their weights have stabilized. As you know, they did lose some weight - approximately 4 to 5 pounds, but they now have stabilized. The Commander's at about 145 pounds; the Science Pilot, 129; and the Pilot, Lousma, at 189. Most of that 189 is muscle, not adipose tissue. In general, the medical experiments have been going well and we've had several runs in each category. I'd just like to make one comment about the 131 experiment, that's vestibular experiment. It appears, at least from the data that we received from two of the crewmen that their threshold to motion sickness is now quite elevated as we had seen in the Skylab II crew and we do not anticipate any further vestibular problems from this crew at this time based on the results of those tests. We have completed several runs of the M092 series as you're probably aware. The first run on the Commander of the M092 had to be stopped because of abdominal pain because of a poor fit in the seal area. This was corrected by adjusting the saddle position and his next run, which was completed - he completed the entire protocol yesterday with no problems whatsoever. The heart rates were somewhat higher than preflight but other than that it was a nominal run. The Pilot, Jack Lousma, also had an M092 run and his resting heart rate is back to essentially preflight values. So, in general the Skylab III crew is in the same status or category as the Skylab II crew was at this point in their flight. And we've seen no cardiac decrement at this time. That's all the general comments I have. Do you want to save questions until the end?

PAO I think maybe we could go along with Ed because I think all the questions are a tie-in generally in the same condition.

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DIETLEIN Okay. Then Mr. Michel will discuss the M171 exercise protocol, the bicycle ergometer and so forth.

MICHEL To date, we have two runs on each crewman. All were completed as programmed. As in SL-II, we did see evidence that there was a learning problem of riding a bike in the zero-g environment as demonstrated by elevated heart rates and ventilation. We saw that there was a distinct improvement from the first run on each of them during their second run and that they're now approaching their preflight means. By the way, I guess you all realize that we sent up a different handlebar configuration for the SL-III crew. It was - I'm not sure exactly when it was put on. It was put on prior to yesterday's two runs, I'm sure of that. And it was not used on Garriott's first run. But whether it was used on the first two runs - the first run on the Commander and Pilot, we're still investigating that. But it appears to be helping. We did not see the differential in heart rate that we noticed in SL-II. The differential is not that great this time.

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(CONT'D) The differential in heart rate that we noticed in SL 2 the differential was not that great this time in the process of learning to ride the bike in zero g.

SPEAKER Ed, do you want to comment on their none bicycling exercising?

MICHEL Yea, as you know the beginning of the flight they had problems vestibular problems with time lines and they did not exercise very much if at all about the first 5 days we have now made an input to the time line people which requires either two 30-minute periods of personal exercise for each crewman or one 60-minute period per day. On those days they do not run the 171 on the days they run the 171 they require a 30 minute personal exercise period and these are being adhered to when they are in the time line every day so from now on they should be getting their proper levels of exercise at least have the - the time line capability of doing the exercise if they want to.

SPEAKER Dr. Whittle, discuss the diet.

WHITTLE As you know the crew experienced vestibular problems early in the flight and this has been reflected both in their body weights which I heard Dr. Dietlein referring to as I came in and also in their level of nutritional status just go into a little bit more detail on the weights as this is quite interesting all three crewmen dropped about 3 pounds in weight between launch and the morning of the first full day in flight. It's impossible to loose that amount of weight just by sort of not eating and loosing fat this has to be loss of fluid and this will fit in very well in the fact that they were feeling nauseated and were taking in very little of fluid although the figures we had back when urine volumes suggest their production of urine looks reasonably normal at this time so that all three of them lost a good deal of body fluid during that first period. Now in the following couple of days they continued to lose about another two pounds each so that by 5 days into the flight all three of them were about 5 pounds down on the weight that they were at when they launched and we're sure that most of this weight loss was in a form of fluid. At that time the calorie intake all three of them was down to between a third and a half of their sort of nominal diet what we expected them to eat. And then at about the - between the third and the fifth day of flight their claorie intake picked up and it is now or about the last 4 or 5 days they've been eating the full diet and in fact have been feeling hungry and in consolution with the Principle Investigator on the mineral balance experiment we have been able to allow them a few additional foods over and above the diets which were planned for them in an effort to apease some of their hunger and bring them back into a more balanced state nutritionally and over the last 5 days they - none of them showed any trend in the weight of - they all of them

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fluctuating up and down in weight that is perfectly normal for everybody but there's no continuing trend of weight loss although we haven't really seen any gain in weight in any of the three crewmen which suggest that the situation has now stabilized the fluid loss early in the mission probably been slowly replaced but - this is probably as far as their weight is concerned being roughly counteracted by the fact that they are now going into this condition that we saw in Skylab 2 where they're not using the muscles of the lower spine and the legs very much and these muscles are probably gradually losing bulk and we're probably seeing two factors going on at the same time which is just about cancelling each other out. One is a gradual return to normal of the amount of fluid in their body and the other is a gradual reduction in the bulk of the muscles of the legs so that we really don't see anything in their weight figures but we're fairly certain that these two factors are going on together as far as their body fat is concerned they probably all lost a little bit of fat as a result of the low caloric intake during the first 3 or 4 days of the flight. And on their present caloric intake they may or may not regain some of this fat we haven't sufficient precision in our measurements to tell but this is something we will be able to measure on them post flight. But from the nutritional standpoint they're now eating extremely well we're quite certain that they're back into what is normal weightlessness in the sort of nutritional balance and we're very happy with - things are going along very well now.

SPEAKER Okay, ladies and gentlemen if you'll direct your questions to the individual.

QUERY Perhaps this is for Mr. Michel, I'm not sure but; as far as not being able to obtain the prescribed exercise during the early part of the mission can you foresee any effect that this might have on the overall de-conditioning process?

MICHEL Not in the amount of time we're dealing with and right now the exercise level - the personal exercise level that were seen coming back since they started exercising are much higher than we saw in SL-2.

PAO Bruce Hicks.

QUERY Yes, Dr. Whittle, on their weight changes and all do you see any trends that would indicate either the crewmen are going to stay right where they are for the rest of the flight, or they going to come back fat or is Lousma going to come back with a big stomach or is he going to stay muscle-bound that he is or you know what do you foresee at the end of 59 days?

WHITTLE On the data we've got so far it's not possible to make any predictions but what I can say is what I think will happen based on what we saw in Skylab 2 and that is the actual amount of fat on the body will probably change very little but the amount of muscle in the body will decrease

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steadily throughout the mission and we expect to see a
loss of fat of somewhere between 1 and 2 pounds of - sorry
did I say fat? - A loss of muscle bulk -

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WHITTLE - - throughout the mission and we expect to see a loss of fact of somewhere between 1 and 2 pounds - I'm sorry, did I say that - a loss of muscle bulk between 1 and 2 pounds per week over the mission. So over an 8-week mission, we expect them to lose something like 8 to 12 pounds of muscle. This, obviously, depends on how much muscle you've got to start with. We expect Lousma to lose more than Garriott, for example.

QUERY He's not going to come back a 90-pound weakling or anything I wouldn't expect.

WHITTLE I very much doubt that.

PAO Abbey. Right here.

QUERY Does this muscle loss ever level off?
Are there any plateaus that you find in the - -

WHITTLE We have no means of knowing. My guess would be it must level off eventually. You can't go on losing muscles till you've got absolutely none. So it must level off, but we've no way of predicting at what level it will do so.

PAO Arthur?

QUERY Dr. Whittle, have you noticed any diet peculiarities, such as Conrad's fondness for butter cookies the last mission and, of course, I know they mentioned the strawberries - they're not eating this, because they think there's something wrong with them, so perhaps you could shed some light on that as well, but I'm mainly interested in what you may have noticed about any diet peculiarities thus far.

WHITTLE No, they're all eating just about the same combinations of foods that they did on the ground. I think the only real change we've seen is that Lousma seems to have taken a liking to the apple drink and he's consuming those in large quantities. I suppose that would be equivalent to Conrad's liking for the butter cookies.

PAO Is that the in-house drink?

WHITTEL I beg your pardon?

PAO Is that the in-house drink?

WHITTLE I'm afraid I can't answer that. I don't know who made it. On the strawberries, the Skylab II crew returned a can of strawberries and they didn't look very appetizing. They turned in color, from red to brown. Ah, we rehydrated and tasted them, and to me as a sort of non-expert in the actual sort of, what food should and shouldn't taste like. I thought they tasted excellent. If I had shut my eyes, I wouldn't have known they weren't fresh dehydrated strawberries. But, our technical taste panel, thought that they were, you know, quite a lot down on what

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that should have been like. But to the untutored observer, I thought they were fine. But it may well have been that various chemical processes started up in the strawberries, as a result of the exposure to heat. And that these are being continuing, even though they're not too reasonable temperature and they may taste worse now, than the ones that we returned from Skylab II did. But, we have some tests being run on them, all these foods, at the sort of temperature profile that they've been subjected to. And, we're now, at the moment looking at the strawberries to see if there is some, some problem there.

PAO Pete, did you have a question?

QUERY Yea, I wanted to ask Dr. Dietlein to recap Garriott's and Lousma's EVA activity, and what you saw following that, in a way of say tiredness, heart rates, as compared to and how it might compare, have compared to the Skylab II crews after they're EVA's?

DIETLEIN Well we've just began to play back the heart rates, I guess EVA was scheduled for about 3 hours or so, and went 6 hours, 6-1/2 hours or so. And, ah - -

PAO 96 minutes real time.

DIETLEIN - - ah, I saw some of the EKG traces this morning, and ah, Garriott's ah heartrate in general, tended to be faster or ah then Lousma's. And there were some ah occasional ah - ah ectopic beats noted ah throughout their runs on both of the individuals. But these ah, not, these are unifocal type things, and nothing to be alarmed about really, we've seen these before and expect to see them again. As regards to metabolic expenditures, I think Mr. Michel probably has a better handle on that, the average, on something like that - -

MICHEL It was about 930 for the SPT, and I believe the pilot was about close to 1100.

DIETLIN This is a relatively long EVA. All of the objectives as you know were, were accomplished. And because part of postfli - I mean after this - there was some fatigue on the parts of the crewmembers, as well as the ground crew. Ah, but I think they did it very well, and everything went quite well.

PAO Bruce Hicks.

QUERY I guess for Dr. Dietlein and Dr. Michel, is, have there been any arrhythmias noted during the exercise, or the 171 runs, or anything like that, or has, and at the same time, has there been any other medical problems, other than motion sickness, in any case?

MICHEL There was 1 single solitary arithmea in the, I believe it was the second step - -

DIETLEIN 171.

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MICHEL - - I'm sorry. Yea during 171, on 1 individual, that's what I'm trying to think of. It's either the uh, it was either the Science Pilot or the commander, I'm sure of that and - -

PAO Arthur.

MICHEL - - I'll think of him.

QUERY Can I get the last part of the question.

PAO Oh, I'm sorry.

QUERY Any other medical problems whatsoever, other than motion sickness?

MICHEL No, motion sickness was the primary problem, no other medical problems that we're aware of, nothing requiring any medication.

PAO Arthur Hill.

HILL How about the sleep monitoring experiment, do any of you gentlemen have any ideas to how that's been going?

DIETLEIN We just completed the last of three days, 3 successive days, last night, and the data has not been analyzed yet, to the best of my knowledge.

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DIETLEIN - - data has not been analyzed yet, to the best of my knowledge anyway.

QUERY But they have three complete runs.

DIETLEIN Yes, but we just don't have the data analyzed.

QUERY Then, then the fix on the sensors and so forth, and from the last mission, it's working okay?

DIETLEIN Yes. No problem with the sensors.

PAO Abby.

QUERY On the lower body negative pressure test, exactly how many runs have been run on each of the crew and what has been the change in the cast circumference. Has it been as great as the - what was observed in the first Skylab crew?

WHITTLE They were run the same as 092 was preceded the 171. So there's two on each.

DIETLEIN Two on each have been run, yes, and the calf sizes, I don't - I'm afraid I don't have that data.

WHITTLE He did men - Dr. Johnathan did mention that he thought that this crew was about the same stage as the SL-II crew this time.

DIETLEIN At this time in flight. They're comparable both in leg volume changes and in response to the lower body negative pressure. I don't think there's any great change to write.

WHITTLE Let me check Dr. Johnson if we have any change - - Yes.

QUERY They mentioned that in formally they were going to take tape measures of their arms and then the muscles in their legs and various places. Have they done that and reported to you and have you noticed any shrinking?

DIETLEIN Well, this is done preflight and postflight and to my knowledge, they have not done the inflight -

WHITTLE I haven't seen anything -

WHITTLE We have no data from the flight yet- This can easily be done though.

PAO Peter.

QUERY On this - on their feeling of - air to date Bean commented that with the hectic work schedule that they had going, they were messing up their meal schedules - radically. And he mentioned and/or digestion too. Was that - and probably messing up the medical experiments. Now are these really subjective viewpoints or is there any evidence that they had any digestive upsets or uneasiness? And what effect would - might it have had on the medical experiment data?

DIETLEIN The only digestive upsets that I'm aware of are those were related to the motion sickness problem. They

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(CONT'D) are in a rather accelerated state trying to do as much as they can to catch up as you know. And I guess it's sort of an eat and run type business. And I think upon the last 171 run, they actually had eaten just prior to it I believe. But they went along with the run and there's no appreciable difference in the run that we could detect.

MICHEL We haven't been through all the data yet.

DIETLEIN But we - but we haven't looked at all the data yet. It's - they're really getting started in the medical experiments, and getting the data back and looking at it. So it's - it's a little early to say. But I don't think they have any digestive problems per se other than that related to the earlier motion sickness thing. And they have no history of peptic ulcers that I'm aware of. Unless the flight is sufficiently troublesome to generate some symptoms like that. But that's the first I heard of it. They haven't complained about it.

QUERY On the vestibular function, how much set-how much more immune to motion sickness were they in the chair. Like the first Skylab crew. In other - what were their rpm's in flight compared to the ground on the two crewmen that they ran the studies on?

WHITTLE On the II, I think they went up to 18, was it, and the threshold was off-scale high. So, the threshold is now is very high.

WHITTLE The last one was on run at 20 rpm which was his - -

DIETLEIN Well, 18 or 20 - -

SPEAKER The level he was run at preflight and he showed no mission sensitivity at all up there of the repeat of rotation. So he's obviously far more immune than was in flight. I don't know about the time.

PAO We have a few questions phoned to you gentlemen, that I'd like to read to you. Have you all come up with an opinion of the primary cause of the three crew members becoming ill while adapting to zero g?

DIETLIN Well, I don't think the exact, the (garble) of this is known, and I strongly suspect that we will not know. It's very difficult to predict who will become seasick or airsick, or spacesick even with all the pretesting that you can do and even though there are test pilots that have been through a lot of acrobatics and whatnot; it's just an occurrence that we cannot explain. There was no particular rotation of the complex up there. The - they're activities were the essentially the same as the SL-II crew. I mean getting out of the couches and all and the adaptation time was just different for these three. We have no specific reasoning in the question.

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QUERY The companion question to that, what procedures would be recommended for the SL-IV crew to prevent motion sickness?

WHITTLE Well, if, in my view, from a technical point of view, I would - First of all, you cannot predict whether they will have motion sickness next time or not. They may just as this one had and because of that, I would personally and this is my opinion, advocate prophylactic medication following Dexedrine or some other combination which has been shown to prevent the symptoms of motion sickness. Quite effective. We do have a problem, when you do give any medication of it interfering with the medical experiments because these drugs influence cardiovascular - -

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(CONT'D) Quite effectively you do have a problem when you do give any medication of it interfering with the medical experiments because these two drugs influence cardiovascular system but motion sickness also profoundly disturbs the cardiovascular and other systems so if I had my druthers I would have them take this prophylactically prior to flight or prior to insertion.

QUERY And I believe you have already answered this one but I'll run it by you again. How much exercise has the crew had percentage-wise compared to what was scheduled thus far in the mission? You said that they didn't do any the first 4 days -

SPEAKER Yeah but it's impossible to answer that question because the personal exercise is left up to the crew all we can set aside is the time and we are setting aside as you know twice the amount of time we did in SL-2 for personal exercises so they have an opportunity to do it but I can't answer whether what percentages.

QUERY Again a comparing question to that: do you feel extra exercise will help curtail cardiovascular of deconditioning?

SPEAKER Most assuredly it will help.

QUERY And the point to that one the questionnaire asked that Dr. Dietlein answer that one also. Do you feel the same?

DIETLEIN Well, in the certain bed rest studies in which they've done certain exercises it has helped somewhat but not prevent the de-conditioning process completely. And no form of exercise that we know of will prevent the demineralization of the bones so the exercise certainly does help maintain muscle tone and muscle mass and will help to reduce the negative nitrogen balance that you would see in people in zero gravity or in people in prolonged bed rest. But I don't think it will completely prevent the deconditioning process - No.

PAO Well, one final question. In medical runs to date are there any signs of cardiovascular deconditioning?

SPEAKER I think you have already answered that one.

WHITTLE Yes, well. It's difficult to say because of course we had their preflight norm if you will in both 171 and 092 and up comes the motion sickness business which puts everything out of kilter if you will, and it's not fair really to equate any of - judge any of that early data that was monied by the motion sickness. I think we are now in the time period in which we are free of motion sickness business and both the M092 and the, as Michael says, 171 looks quite good and they're at the same stage essentially as the SL-2 crew was so my - I think at this point and time we have seen no real deconditioning certainly not on the 092s that we have seen.

PAO Well, ladies and gentlemen if no more questions, thank you Dr. Dietlein, Mr. Michel, Dr. Whittle.

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