Matt:

I read somewhere that, because you're not really wearing shoes up there instead you're using your toes more to grip surfaces ... That like the whole callous structure on the bottom of your feet changes to where you develop calluses on your toes, because you're using them almost like fingers.

Nick:

Yeah. Add that to one more thing that I'm sure is uncomfortable when you get back down to gravity. The bottom of your feet getting back used to existing.

Theme in then under

Emily:

Welcome to AirSpace, from the Smithsonian's National Air and Space Museum. I'm Emily.

Matt:

I'm Matt.

Nick:

And I'm Nick.

Matt:

Come November, the International Space Station will have been in use for 20 years. It's been up there so long that most of us tend to take it for granted that this big international effort in science and cooperation is just there all the time, flying overhead.

Nick:

For the astronauts that go up, it's a once in a lifetime experience, unless you go two or three times. But it's also very highly scheduled and regimented. There are so many maintenance tasks, science experiments, and other chores that you have to get to every single day.

Emily:

Now Space Station dwellers do actually have some unscheduled time. And part of their training involves making sure that astronauts know how to use that time to take care of themselves. We're talking downtime and self-care on the International Space Station today on AirSpace.

Music up and out

Nick:

Connecting with nature, connecting with family. Focusing on what we're eating, focusing on getting enough exercise. These seem, like, fairly straight-forward, though important. But it turns out that those are not actually dissimilar from what astronauts concentrate on on-board the International Space Station.

Astronauts are just like us. No, in fact, they are not. (all laugh) The ISS is nothing like our environment. As we're diving into what a day off on the International Space Station looks like, the first thing that occurred to me is the space station is a pretty needful thing. And astronauts are pretty focused, mission-oriented people. So a day off on ISS is a lot more like a day off on a farm, where you're still probably getting up at 6:00 AM, and you've still got several hours of chores, whatever those may be, before you can make yourself a cocktail or a quesadilla or settle into a movie.

Emily:

So, before we talk a little bit about what it looks like for an astronaut to take a day off, we should probably do a quick overview of what it actually looks like for an astronaut on a normal day on.

Nick:

We've got kind of a sample schedule here in front of us. And it turns out that an astronaut's “work day,” he said with air quotes, is actually a little bit shorter than I would've thought.

Emily:

Yeah. I was surprised by that too. I was expecting much longer days and much more rotating schedules.

Nick:

Yeah, exactly. It turns out that only about 6.5 hours of the day are allocated for their work-task work tasks. But then we also have to account for just being up there is so much work. A lot of that gets shifted into the astronaut's personal time. The first thing I think that we can cite, is two-and-a-half hours of mandatory exercise every single day.

Emily:

Including your days off.

Nick:

Yes. And you still can't stand up when you get back to earth after a few months in a weightless environment. (all laugh) So they spend a ton of that time on the treadmill with the resistance belts, doing the old-timey, Atlas in the back of a comic book ad, kind of spring exercises and all of those kinds of things.

And that's got to be fit in along with, let's call it, seven hours worth of daily tasks, along with meetings, along with maintenance, along with food prep, and 8.5 hours to sleep every night.

Emily:

And I think it's important to say that's sort of your average day. If there is a spacewalk planned, if there are other kinds of extra tasks that happen ... They're not constantly getting cargo shipments, but when you get a cargo shipment, you have to imagine that's going to really change what your day-to-day looks like and so, I think it's important to note that we as ourselves, feeling like we're working really long work days, they are too. But when you break it down into this schedule, it almost looks like it's kind of a light workload. But it's totally not. And it's got to be changing regularly.

Nick:

I would never consider 6.5 hours of hard science and life support maintenance to be a light workload.

Emily:

Oh, I was just thinking about in terms of how many hours a day, but you're totally right. Not all hours are created equal.

Nick:

So, that's a taste of what a normal work day is like. What happens when they punch out? Astronauts have a time clock. Right? There's a big old fashioned time clock with the time cards and … like *chunk, chunk*

Emily:

With the lever?

Nick:

Yeah.

Matt:

I really hope so.

Emily:

I think of it in Flintstones. Have you ever seen in Flintstones where they put the rock tablet in the dinosaur's mouths and its two teeth?

Nick:

No, no, no. That's exactly what I was thinking of too. The kind that actually punches out the ... Yep.

Emily:

I bet there's a dinosaur up there for the punch card.

Matt:

That's where they're hiding the dinosaurs.

Musical transition

Emily:

One of the things that I remember being the most interested in when we were talking about Apollo, was the personal care packages that each astronaut was allotted for their individual trip.

That's something that's held over to astronauts going to the International Space Station. They get allotted, not so much a certain volume, as much as a certain amount of weight of things that they're allowed to bring with them.

Nick:

Right. Astronauts on ISS have 3.3 pounds of personal items that they can bring with them.

Matt:

When I think about packing for the International Space Station, I think about the road trips when I was a kid. And we didn't fly when we would travel from the Midwest to Arizona to visit my grandparents. And so, you would bring along a magnetic chess set that you could play in the car with one of your siblings. Maybe a book of crossword puzzles. Small stuff, light stuff that was nonetheless diverting and entertaining.

Emily:

I know of enough people who know enough astronauts that I feel like a lot of that weight actually gets taken up by the small trinkets and mementos that astronauts bring up to the space station for friends and family.

Nick:

That takes up a lot of the 3.3 pounds, but there's a bunch of common property that's dedicated for like, normal humans being human. There's a guitar. And I think there's also a keyboard. What else is up there? There's a library.

Emily:

There's internet.

Nick:

There is. Yes.

Emily:

Right, so I don't imagine you have to bring up your own screened, internet-capable device in order to stream your televisions and movies. But that's something that you can do in your free time if you are an astronaut on the space station. So, the first thing that you guys do at the end of your work day though, or at the beginning of your weekend ... One of the first things we think about doing, usually here on Earth, is having an adult beverage. I think it's probably one of the most asked questions, besides the space toilet. "Can you have a beer in space?"

Nick:

The official answer is, no. The line is "No, you cannot." And it's not up there and you cannot imbibe it. However, it's more complicated than that. For one thing, you've got a lot of countries that think about the end of the day cocktail a little bit differently. So we can't necessarily account for everyone. All we can give you is NASA's official ruling.

The other thing is that there are actually a lot of experiments about how alcohol works in space, onboard ISS. There have been whiskey aging experiments up there. There have been experiments on how to grow hops. And I have read that there are also bottles of wine up there, just to see how they age in microgravity and whether there's any difference.

Now, if you're an astronaut, probably drinking your science experiments is not going to go over real well. But that's also not to say that nobody has ever been tipsy in space. Particularly, some of the earlier space stations like Mir that was operated by the Soviet Union and the Russian Federation had ... I don't know, is copious the right word for the amount of alcohol that may or may not have flown aboard the Russian space stations?

Emily:

We're getting the subtle nod.

Nick:

So yeah, no, there has been drinking in space. The thing that none of us want to know is how bad is a hangover in space.

Musical transition

Matt:

What about what is unique about the International Space Station? What can you do to unwind there that you can't do anywhere else? And that's where I think the most amazing part of the International Space Station is the Cupola. Where you can actually look down at all of earth, and watch multiple sunrises and sunsets in the course of a normal Earth day and just be blown away by that totally rare view. And it must be mind-blowing.

Emily:

Well, and it's often been called the overview effect. Right? I mean, that's something we've talked about on the podcast before.

Matt:

Yeah.

Emily:

The simple act of being in space and looking down on Earth is a really powerful experience for most astronauts. You have to imagine that when you have that powerful experience, and you have free time on the space station where you can just look out the window and experience zero gravity and looking down on a constantly changing earth scape, why would you do anything else, when you know you're never going to get to experience that at any other moment ever again?

Nick:

Not only does the earth look amazing right there in a way that photographs don't capture, but I've read that stars appear in three dimensions. They're bigger, they're brighter, but you can also see the distance and the space between them in a way that is simply impossible on Earth.

The bowl of stars above us looks the way that it does, and is spoken about the way that it is. But when you're up there, you are in it and you get the sense that it's a place. Yeah, it's absolutely entrancing.

Matt:

And you also see, not just the stars of the Northern Hemisphere or the Southern Hemisphere, but you see all the stars. You can't see that from anywhere on Earth.

Nick:

Looking out the window. Not to be underestimated onboard the ISS from a self-care, reflection, and meditation point of view.

Emily:

The notion that self-care is an important part of astronaut training, and is something that is continually being researched as mission lengths are continuing to increase, I think is really telling about how we are doing a better and better job of taking care of whole people, rather than just keeping them alive.

Nick:

Yeah, you're right. And it's important, but it's also not just something that they're trained on. It's also a thing that they're evaluated and graded on. You imagine the life of an astronaut, it's not necessarily surprising to find out that they've got to pass tests on relaxing also.

There are exercises and activities that are designed to ensure that they know how to disengage, and how to check in and when to reach out because they're having a bad moment. They need support from the people around them, not just their family on the ground, but the other immediate astronauts and that they all know what to look out for, because in addition to being a spectacularly stressful and isolated existence, if you know any type-A people out there , and you can envision what an astronaut might be with a capital type-A. You know that those folks, when they become really focused on something that's important to them, can also rattle themselves apart pretty easily.

Emily:

Sure. And I think that's what's really interesting about space missions getting longer. The psychological test that the Mercury astronauts went through were fundamentally different.

Matt:

If you imagine that in, sort of, historical context, that you're saying now that astronauts on these long duration missions have to be kind of aware of their own inner mental workings. And willing to admit when they need socialization or they need help or whatever it is that they need.

If you think back to, like, the original Mercury astronauts, can you think of any guy in that group who had that type of self-awareness or ability to reach out for help? I mean, that's not what you think of when you think of those original fighter pilots.

You think of these strong, silent types who are going to endure whatever they have to endure and come out victorious, nonetheless. But probably aren't going to reach out for help if they need some help.

Musical transition

Emily:

Nick, you found a list of the movies and TV shows that are currently available to astronauts on the Space Station?

Nick:

Yeah. Everything that's up there now, everything that has ever been up there, a reporter filed a FOIA request and got a really interesting list. The one thing that I saw on the list that I wanted to share with you guys was that West Wing's, season one through three, but not four through seven, have flown on ISS. (sighs) I think we could get into why, but I can confirm that they were at least available. It was seasons one through three, but this list was from 2015. So they certainly had a lot of years.

Emily:

Sure. And we don't know what's gotten watched. We only know what got sent out.

Nick:

Right. But I think that ... That just proves the thesis that astronauts are just like you and me. Right?

Emily:

Yeah. I run marathons for fun in my spare time.

Nick:

While watching West Wing on a giant TV screen.

Emily:

While watching West Wing. I am shaking my head vigorously.

Nick:

150 percent.

Exit music in and under

Emily:

Well, that's it for AirSpace from the Smithsonian's National Air and Space Museum. You can follow us on Twitter or Instagram @airspacepod. AirSpace is produced by Katie Moyer and Jennifer Weingart. Mixed by Tarek Fouda. Special thanks to Andrew Fletcher. Distributed by PRX.

Music up and out

Emily:

You know the Martin family minivan had a chamber pot full of crayons?

Nick:

A chamber pot? That's descriptive.

Emily:

No, no. It was a literal chamber pot full of crayons.

Nick:

Like an antique?

Emily:

An antique, ceramic, chamber pot of crayons.

Nick:

Wow.

Matt:

Wow.

Emily:

Now it weighed more than 3.3 pounds. So, I suspect that wouldn't be the thing that I would bring onto the International Space Station.

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