# How to Properly Hydrate & How Much Water to Drink Each Day | Dr. Andrew Huberman

How do we actually measure dehydration Now you hear different things like if you pinch the skin on the top of your hand and it takes more than three seconds to uh lay down again flat then you're dehydrated You hear that You hear ok if you are to uh press on your fingernail and see a change in the color of the tissue just be below your fingernail which indeed does happen and it does not go back to its original color within 1 to 3 seconds Then you're dehydrated You hear things like this If your ankles are swollen when you're wearing socks you take off the socks and you can see the imprint of the socks on your uh lower limbs that means you're dehydrated You hear this kind of stuff and you should probably be wondering is any of that true to some extent it is true although it can vary quite a bit by how old you are or whether or not you're um the skin on the top of your hand tends to be looser or not depending on whether or not you're leaner or not So in other words those are not absolutely objective measures of dehydration Now it is true that if normally you can pinch the skin on the top of your hand and it returns to its normal flattened position within about 1 to 2 or three seconds and it does not do that within five or more seconds There's a decent probability that you're a little bit dehydrated that you need to ingest some fluid Or that if you press down on your nail and you see the depression uh causes a uh transition from kind of a pink color to a white color and then you release and it doesn't go back to its original pinkish color within a few seconds Well then there's a chance that you're dehydrated But again these are not perfect measures of dehydration You may be surprised to learn and I was surprised to learn that most of the basis for these statements like even a 2% dehydration state can lead to significant reductions in cognitive or physical performance are based on not direct measures of hydration but rather on measures of reductions in water intake which is a different thing right It's saying that ordinarily a person of a given body weight needs X amount of fluid per day And when they get even just 2% less than that amount of fluid then their cognitive and or physical performance is impaired rather than focusing on dehydration of tissues right now that might seem like a subtle distinction but it's actually a meaningful distinction when you think about it However it's a meaningful distinction that we can leverage toward understanding how much water or fluid we need to drink each day Now there we can really point to some solid

numbers that believe it or not are fairly independent of body weight Now I say independent of body weight I'm referring to the amount of fluid that most healthy adults need at rest What do I mean by at rest I mean when not exercising and when not in extremely hot environments So I'm leaving aside you uh desert ultra marathoners or people that are doing any kind of movement or living in environments that are very very hot Here I'm mainly referring to people that live most of their daily life in indoor environments could be air conditioned or not air conditioned heated or not heated What we're trying to arrive at here are some numbers that can work across the board because of course there are an infinite number of different conditions that each and all of you are existing in So I'm not going to attempt to give you a body weight by activity by environment by humidity formula calculation In fact no such calculation exists However there are formulas that can put you into very stable frameworks that is levels of water intake for periods of rest when you're not exercising and for when you are exercising that will ensure that you are hydrating with the one exception being if you are exercising or if you are living in a very very hot conditions and you're not heat adapted to those conditions So what are those numbers In other words what is the answer to the question of how much fluid do we need each day And here I'm referring to fluid I'm not distinguishing between water caffeinated beverages soda tea and so on I'll discuss that in a moment We can reasonably say that for every hour that you are awake in the 1st 10 hours of your day This is important in the 1st 10 hours of your day You should consume on average eight ounces of fluid Now for those of you that are using the metric system not ounces eight ounces of fluid is approximately 236 mL of water And for those of you that exist in the metric system and aren't used to thinking about ounces and vice versa Just think about a typical can of soda in the United States It's 12 ounces in Europe Sometimes the cans of soda are a little bit smaller That's a whole discussion unto itself but eight ounces of fluid that is 236 let's just say 240 mL because we don't need to be too precise here of fluid on average every hour for the 1st 10 hours of your day which translates to an average of 80 ounces of fluid for the 1st 10 hours of your day or 2000 360 mL of water In other words approximately 2 L of water plus a little bit more for the 1st 10 hours of your day Now I want to be very clear that this does not mean that you need to ingest eight ounces or 236 mL of fluid on the hour every hour for the 1st 10 hours of your day I'm certainly not saying that And in fact most people are going to find that they're going to ingest water in bliss That is they're going to have uh perhaps

16 ounces of water 500 mL of water one portion of the day and then maybe a couple of hours of later that they'll drink some more water or some more coffee or soda or some other beverage And another portion of the day I do think however it's important for most of us to take a step back and ask ourselves whether or not independent of any other activity or environmental conditions whether or not we are in fact ingesting 80 ounces or basically 2.4 L of water for that 10 hours of the day that spans from the time we wake up until 10 hours later Now why am I setting this 10 hour framework The reason I'm setting this 10 hour framework is that it turns out that your fluid requirements even just at rest are vastly different in the time from when you wake up until about 10 hours later as compared to the later evening and night time And here I'm referring to people that are not doing night shifts But if you are requesting a number of how much fluid to drink independent of our needs for fluid for exercise that's going to be eight ounces of fluid or 240 mL of fluid on average for every hour from the time when we wake up until 10 hours later that's the simple formulation that should basically ensure that you're getting sufficient baseline hydration for the cells and tissues of your body Now if you are engaging in exercise whether or not it's endurance exercise or whether or not it's resistance training exercise you are going to need additional fluids in order to maximize the effects of that exercise and to avoid dehydration And there too we have some excellent numbers that we can look to Excellent because they arrive from research and this is largely peeled from the episode that I did with Doctor Andy Galpin professor of Kinesiology at Cal State Fullerton We did a six episode series all about exercise everything from strength training hypertrophy endurance nutrition supplementation recovery everything related to exercise You can find all of that at Huberman lab dot com and one of the components of those episodes that was discussed but that some of you may have not heard is that there is a simple formula for how much fluid to ingest on average Keep in mind this is on average when you're exercising And I refer to this as the so called Galpin equation The Galpin equation states that you should take your body weight in pounds divide that by 30 And that will give you the number of ounces of fluid to ingest every 15 to 20 minutes on average while exercising OK your body weight in pounds divided by 30 equals the number of ounces of fluid to consume on average every 15 to 20 minutes When I say on average what I mean is it is not the case that you need to stop every 15 or 20 minutes and consume that volume of fluid You could sip it from moment to moment you could wait half an hour or an hour and then consume a larger bolus of fluid a

larger amount Although it is recommended for performance sake that you sip or consume beverages fairly consistently throughout your training One's ability to do that is going to depend on a number of things like gastric emptying time Whether or not that particular exercise you're doing whether or not it's running or jumping is compatible with ingesting fluid on a regular basis or whether or not you need to do it at different intervals than every 1520 minutes Maybe it's every five minutes maybe it's every half hour you have to adjust for you But if you were to take the hour of exercise or the half hour of exercise or the three hours of exercise and ask how much fluid to ingest It's going to be that Galpin equation of body weight and pounds divide by 30 equals the number of ounces for every 15 or 20 minutes And of course I can already hear screaming from the back What about for those of us who follow the metric system And there there's a simple translation of the Galpin equation which is that you need approximately 2 mL of water per kilogram of body weight every 15 to 20 minutes Again the Galpin equation converted into the metric system is going to be 2 mL of water per kilogram of body weight every 15 to 20 minutes On average I'm sure a number of you are asking whether or not hydration prior to exercise is also important It absolutely is And if you follow the numbers that I talked about before approximately eight ounces or 240 mL of fluid intake per hour in the 1st 10 hours of waking that should establish a good baseline of hydration heading into exercise which then prompts the next question I often get which is is the amount of water that needs to be consumed according to the Galvan Equation during exercise on top of or separate from that that is does it replace the amount of fluid that one needs at a basic level that eight ounces or 240 Millers And there the answer sort of goes both ways I think if you're going to exercise then obviously follow the Galpin equation in some way Again you don't need to be ultra specific about this These are ballpark figures that will ensure hydration So we've set them a little bit higher perhaps than needed to ensure more hydration rather rather than less But basically the short answer is if you're exercising for about an hour most people are exercising for an hour or two probably not more than that Most of my uh workouts are certainly the resistance training workouts last about an hour Well then you can replace the eight ounces or the 240 mL of water that's required at baseline with what you consume according to the gallon equation during that bout of exercise