



THE INFLIGHT HYDRATION PROJECT

-INFLIGHT HYDRATION & THE INFLIGHT WATER MENU

Presented by Sam Wu

SAM WU, WATER SOMMELIER



- CEO and Founder of The Water Sommelier based in Singapore
- Certified Water Sommelier
Finewater Academy March 2019
Doemens Academy July 2018

ABOUT THE WATER SOMMELIER

- Founded in 2019, we are Singapore's first fine water distribution and education company.
- Our mission is to bring the world's finest waters to Singapore – 700km² or 1/3 size of London but with 6 million residents & 17.5 million tourists
- Break new ground, introduce new categories for fine water focusing on health, lifestyle and epicurean experiences.

B-C: Vending Machines, Online

B-B: Horeca, Supermarkets, etc

- We are just getting started....

Bringing You The World's Finest Waters



THE WATER
SOMMELIER

FINE WATER
Distribution | Education

OVERVIEW

Inflight hydration

Suboptimal Inflight conditions

Implications on your body

The importance of inflight hydration

The inflight water menu

The pre-flight lounge Water Menu

The world's first inflight Water Menu

SUB-OPTIMAL FLIGHT CONDITIONS



INFLIGHT CONDITIONS



Low
Pressure



Low
Humidity



Low
Oxygen
Levels



Questionable
Availability of
Safe Drinking
Water



Easy Access
to Alcohol



Long-term
Poor Sitting
Posture

LOW PRESSURE

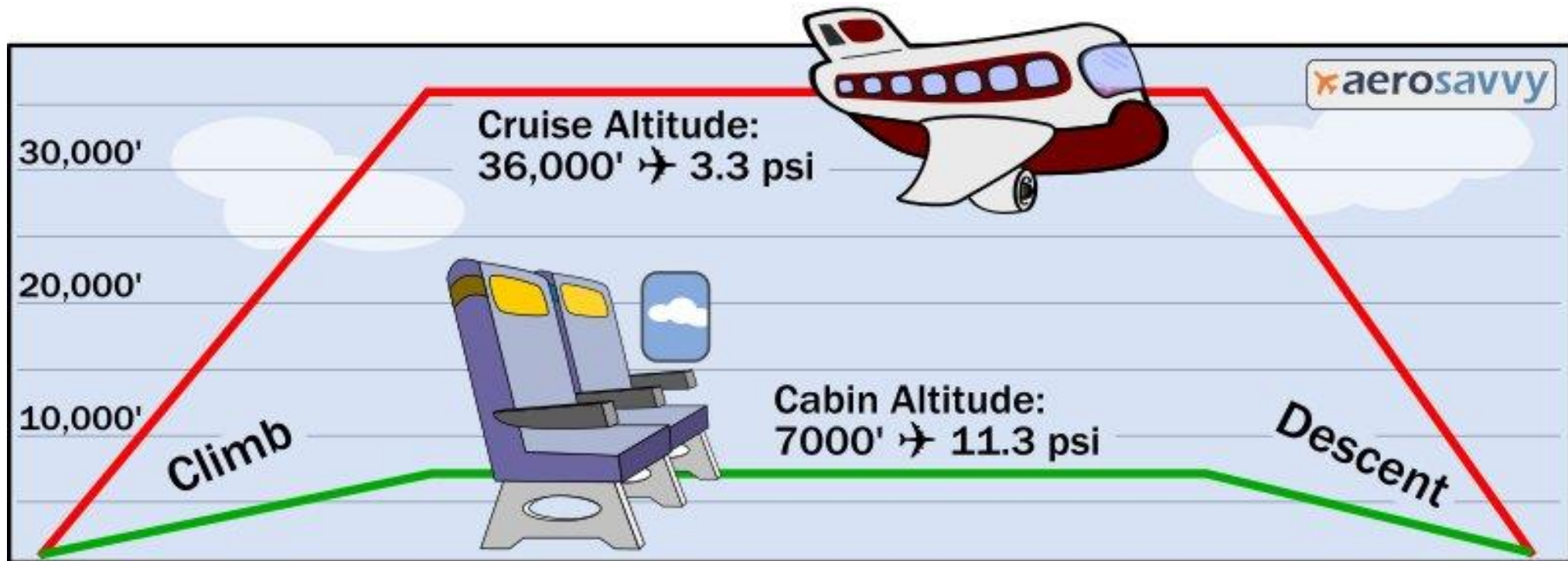
Ground Pressure



Pressurized Cabin
pressure to approximately
5000 - 8000 ft



Atmospheric pressure
at cruise altitude of
35000 ft



LOW OXYGEN

Same % of oxygen available
in high altitudes

Lower pressure



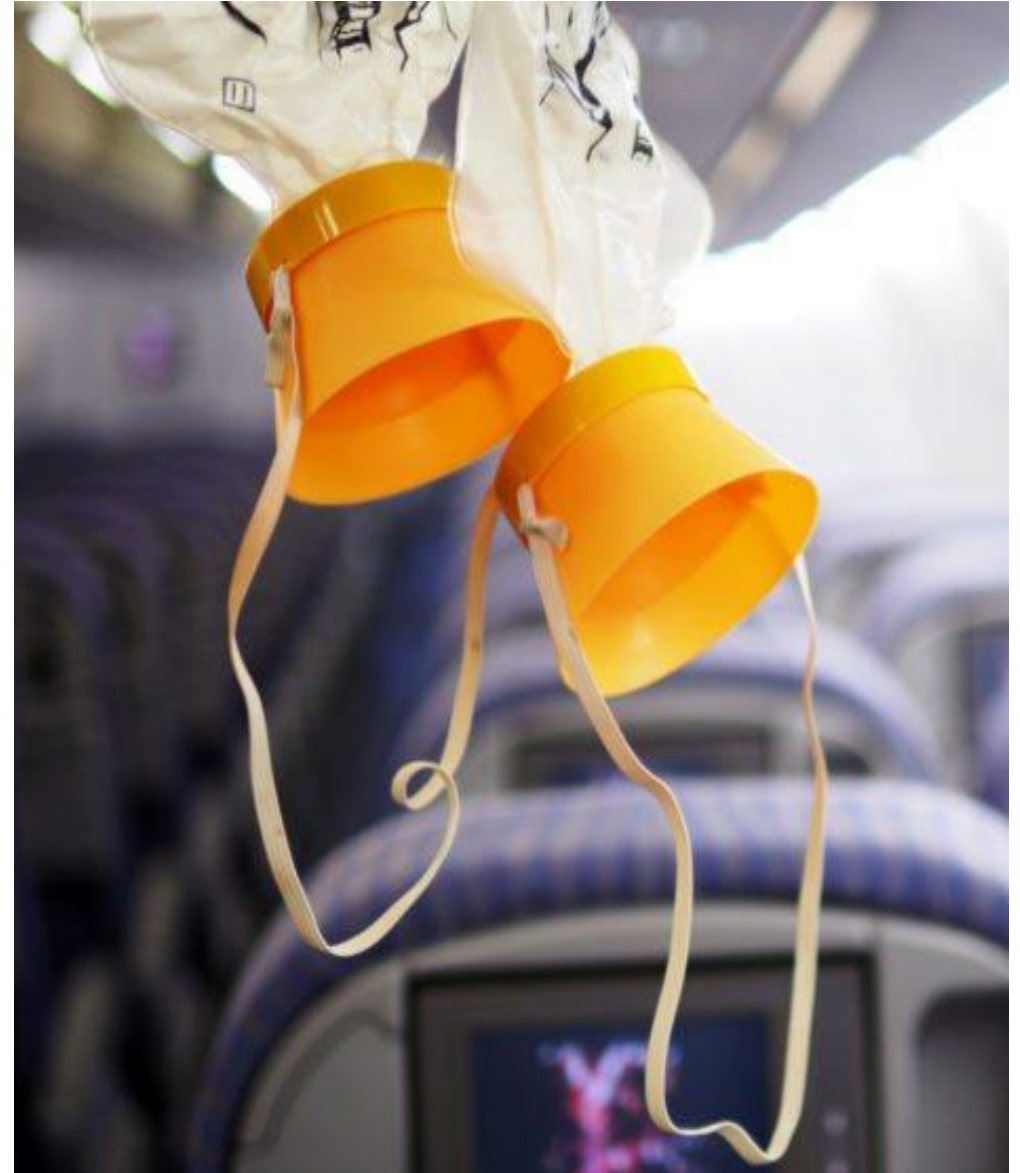
Lower partial pressure of
oxygen



Mildly hypoxic environment



Less oxygen/breath



LOW HUMIDITY

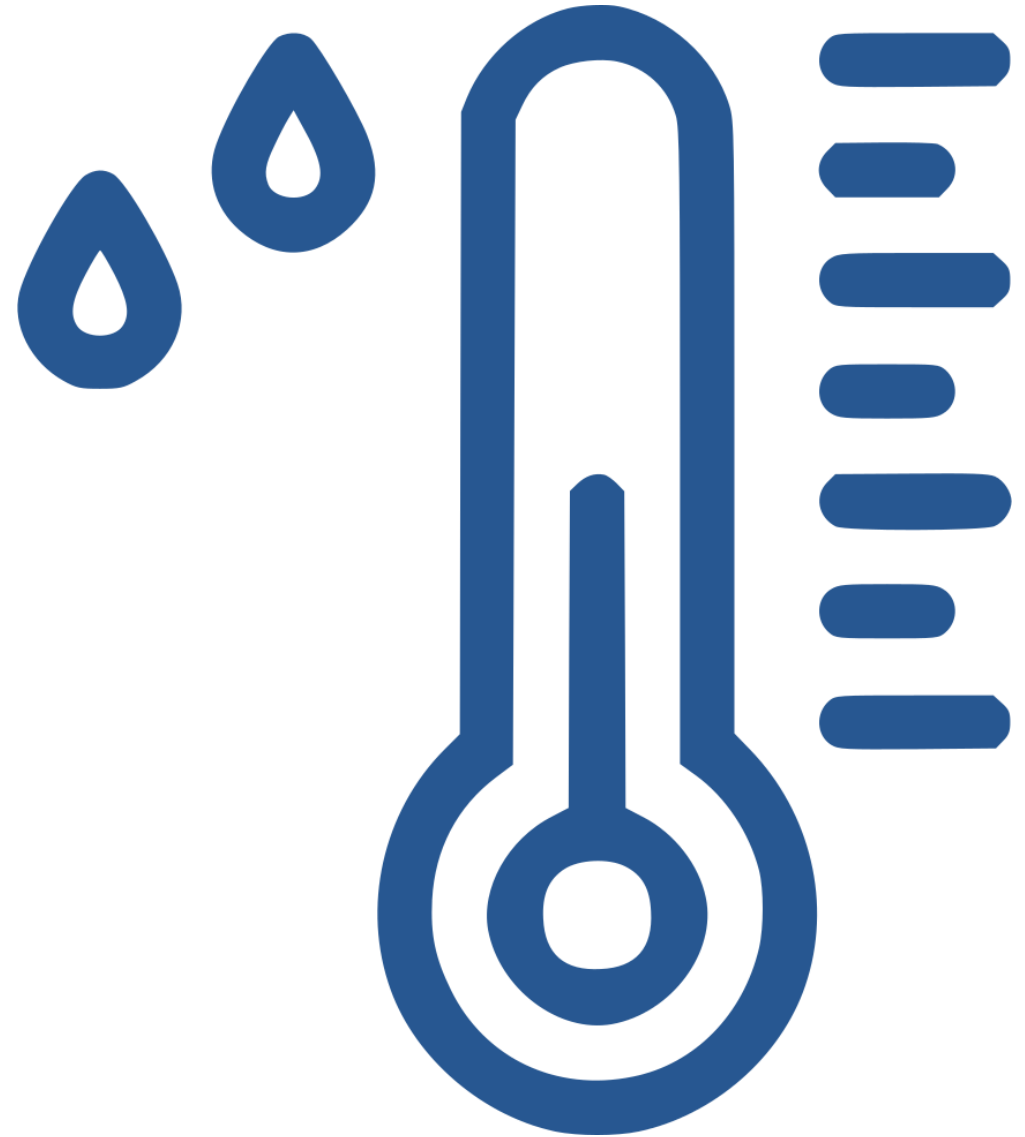
Relative cabin humidity <10% - 20%

Typical humidity varies:

Las Vegas (~30%)

Singapore (~70-80%)

Cabin air can be drier than a desert



AVAILABILITY OF SAFE DRINKING WATER

Risk of contamination

A study in 2015 found that airline water serves as an incubator for 37 different species of potentially harmful bacteria.

Higher risk on long haul flights

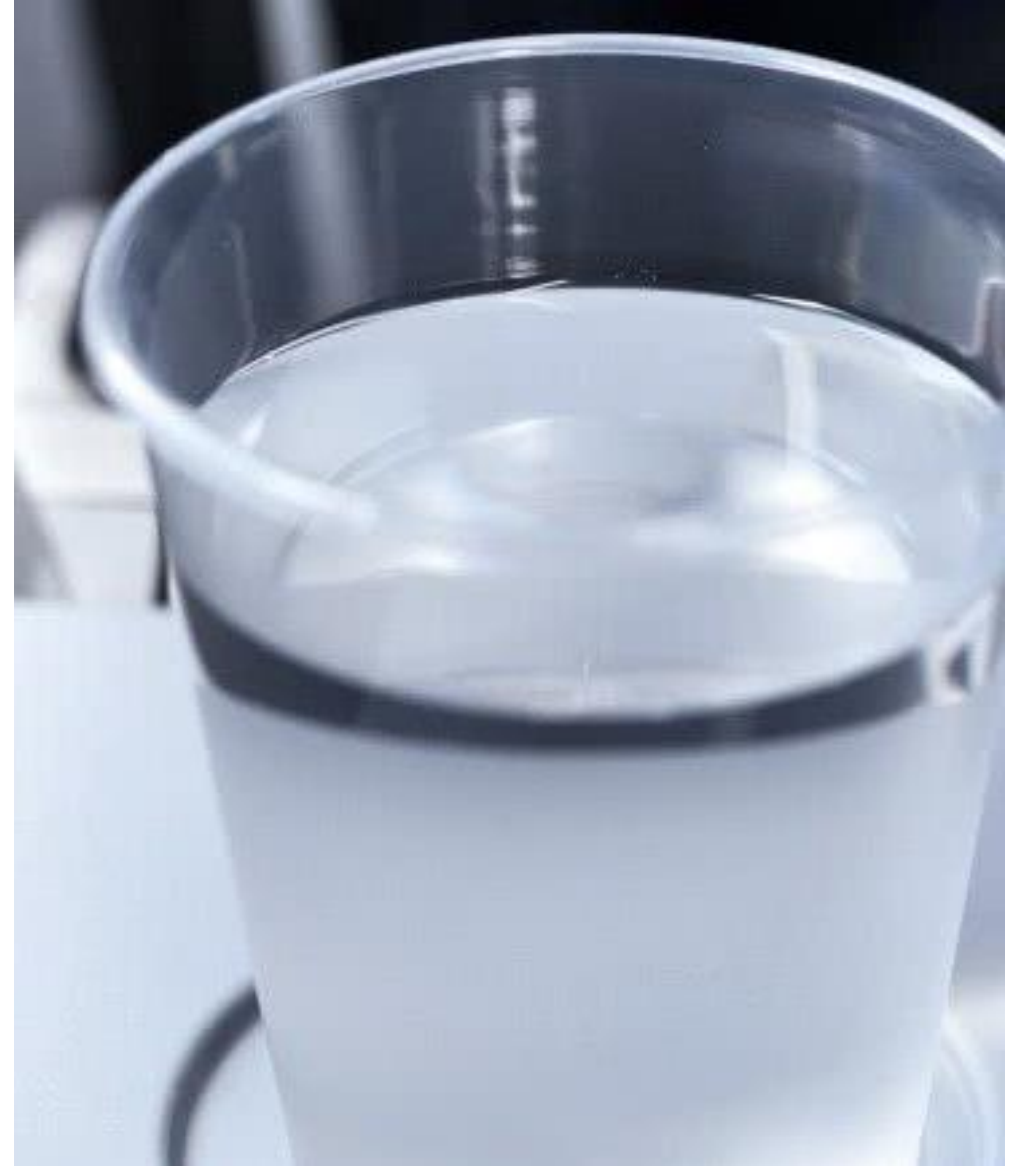
EPA documents reported by [NBC 5 Investigates](#) in October 2013 showed that tap water on 12% of commercial airplanes in the U.S. tested positive for coliform at least once.



AVAILABILITY OF SAFE DRINKING WATER

In a statement by The Association of Flight Attendants-CWA, or AFA:

“The regulation gives broad discretion to airlines on how often they must test the water and flush the tanks. AFA does not believe this regulation goes far enough or is sufficiently enforced.”

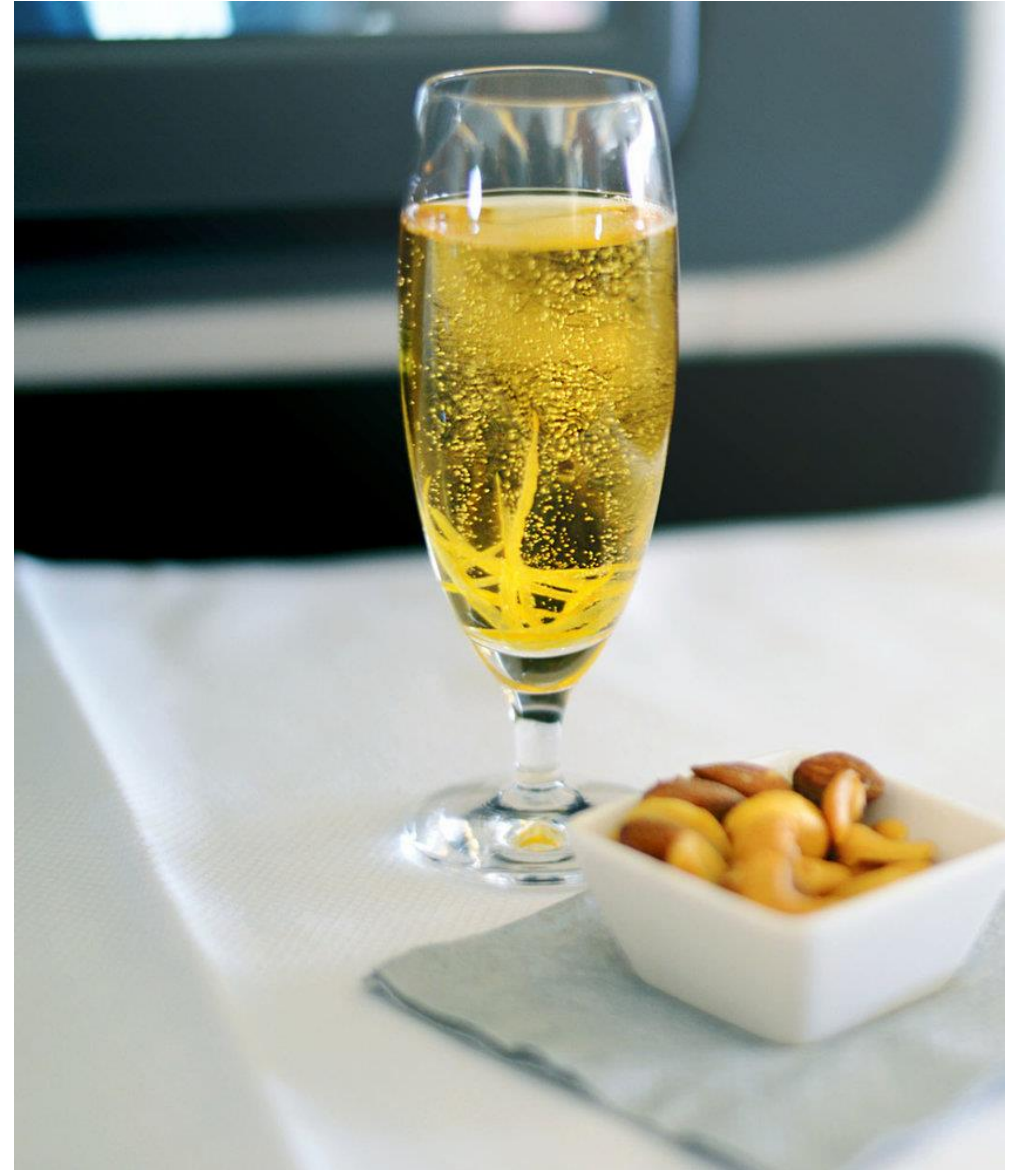


EASY ACCESS TO ALCOHOL

No licensing laws - the sky is in many ways a lawless domain. No age-limit to even speak of.

Airlines are free to make their own rules, and usually they mirror those of the country they are based.

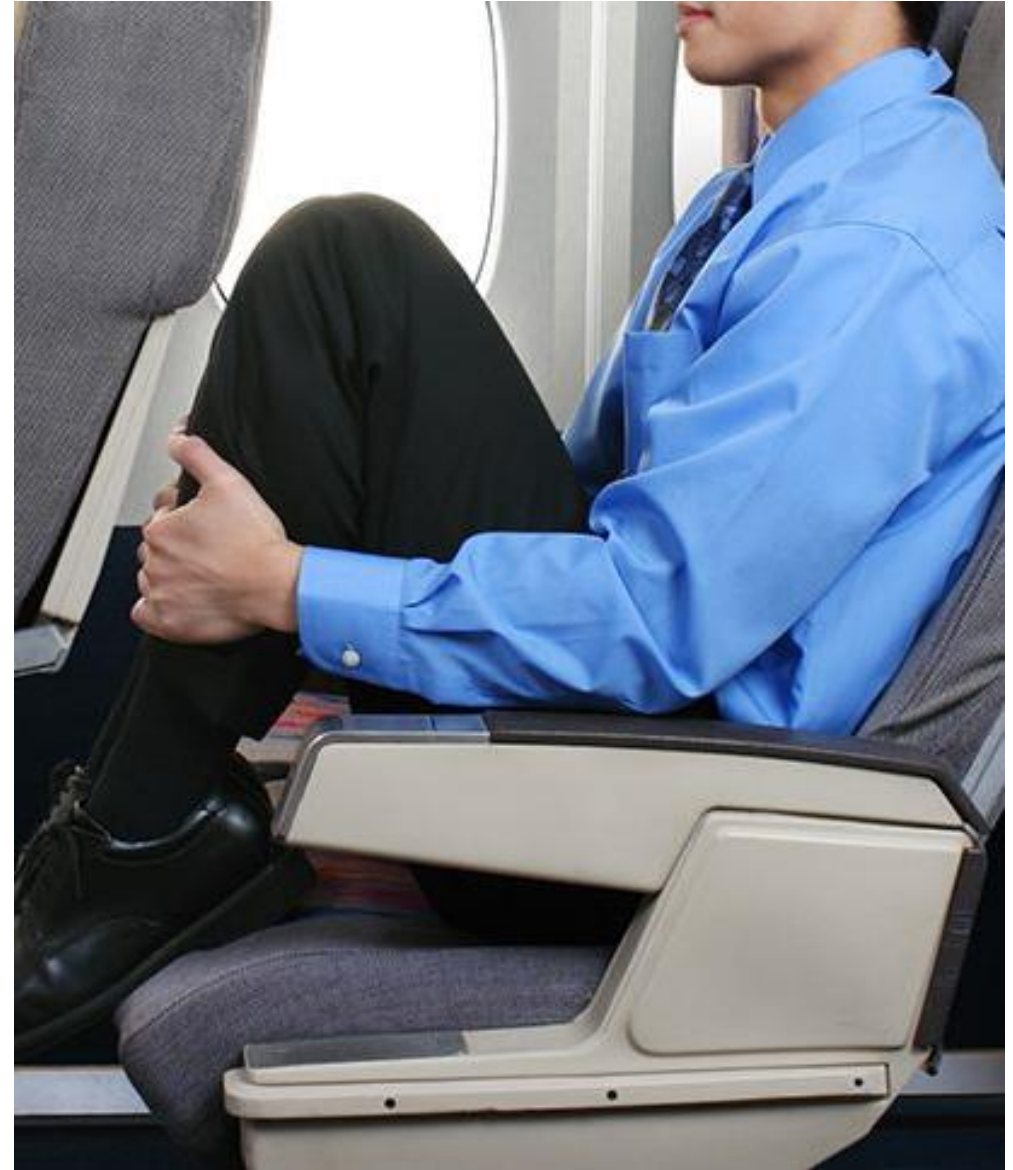
General rule it seems cabin crew will continue to serve alcohol to passengers who request it.



SITTING POSTURE

Fixated, immobile sitting positions for long periods of time.

Cramp spaces with little leg room.



IMPLICATIONS ON THE BODY



WHAT HAPPENS IN THE PLANE

Plane Conditions



Implications on the body



Advice:

Low Oxygen

Low Humidity

Low Pressure

Alcohol access

Sitting Posture

Dehydration

Deafened Ears

Blood clots

Feeling drunk

Feeling bloated

Numb Taste buds

Hydration!!!

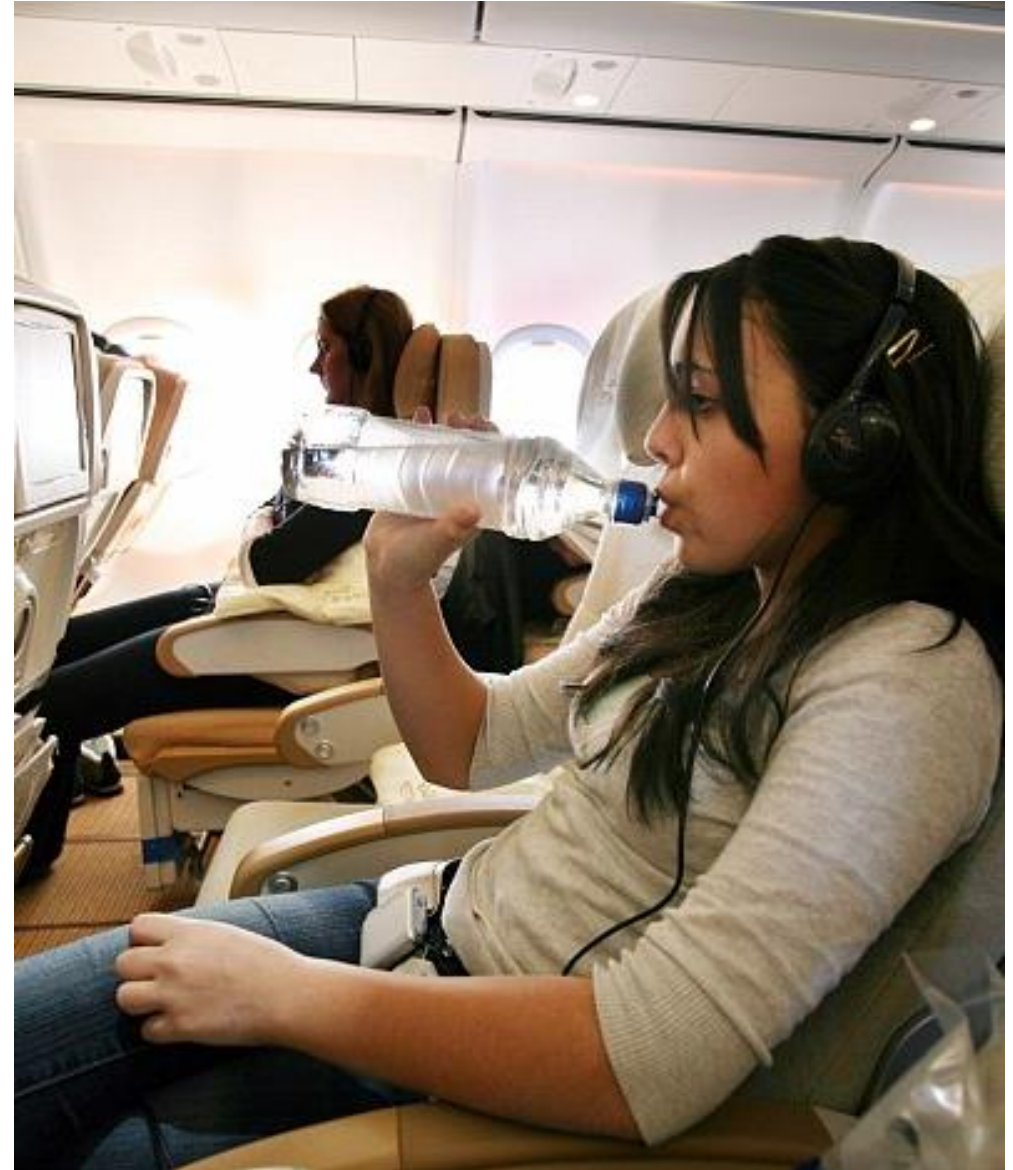


DEHYDRATION

Six hours in a plane simulator leads to a 2% loss in total body water content over this time, despite them drinking 400ml of water.

'Around 50% of this decrease due to 'insensible water loss', due to a combination of the mildly hypoxic environment which increases breathing rate and the dry cabin air.

A 1-2% decrease in hydration has significant impact on the health and mood.



ALCOHOL & DEHYDRATION

Alcohol suppresses your body's antidiuretic hormone that sends fluid back into your body while simultaneously acting as a diuretic, causing increased urination.

Increased urination depletes the levels of electrolytes in our bodies

Electrolyte imbalance linked to other hangover symptoms such as headaches, nausea and body aches.



AM I DEHYDRATED?

HERE'S HOW TO TELL

SIGNS OF MILD TO MODERATE DEHYDRATION INCLUDE:



THIRST



DRY MOUTH



FATIGUE



HEADACHE



INFREQUENT URINATION AND/OR DARK URINE



DRY SKIN OR SKIN THAT'S LOST ITS ELASTICITY

SIGNS OF SEVERE DEHYDRATION INCLUDE:



RAPID BREATHING



RAPID HEARTBEAT



SEVERE DIZZINESS OR LIGHTEADEDNESS



UNCONSCIOUSNESS OR DELIRIUM



NOT URINATING, OR HAVING VERY DARK-COLORED URINE



EXTREMELY DRY OR SHRIVELED SKIN THAT LACKS ELASTICITY

SIGNS OF MILD TO MODERATE DEHYDRATION INCLUDE:



CONSTIPATION



DIZZINESS OR LIGHTEADEDNESS



MUSCLE CRAMPS



BAD BREATH



CRAVINGS FOR SWEETS



ALTERED MOOD, CRANKINESS, OR FUZZY THINKING

SIGNS OF SEVERE DEHYDRATION INCLUDE:



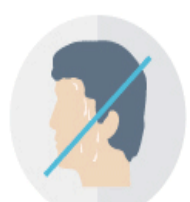
SUNKEN EYES



EXTREME THIRST



LOW BLOOD PRESSURE



NOT SWEATING EVEN WHEN YOU SHOULD BE (FOR INSTANCE WHILE OUT FOR A RUN IN HOT WEATHER)

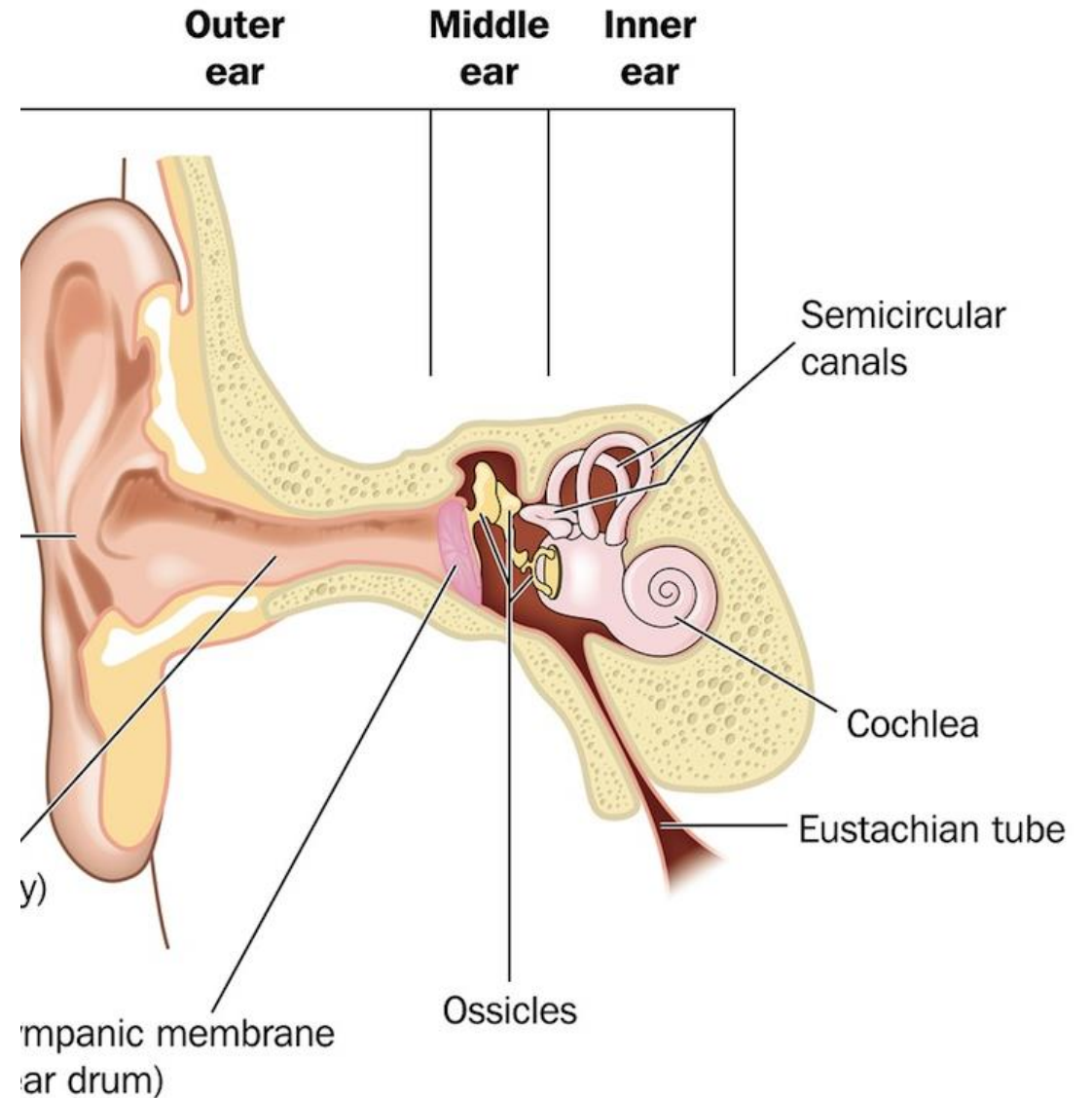
DEAFENED EARS

Changes in pressure difference between inner ear and air pressure.

Trapped air must be allowed to escape/enter from the inner ear via Eustachian tube.

Easier for the tube to exhaust air than to suck it in.

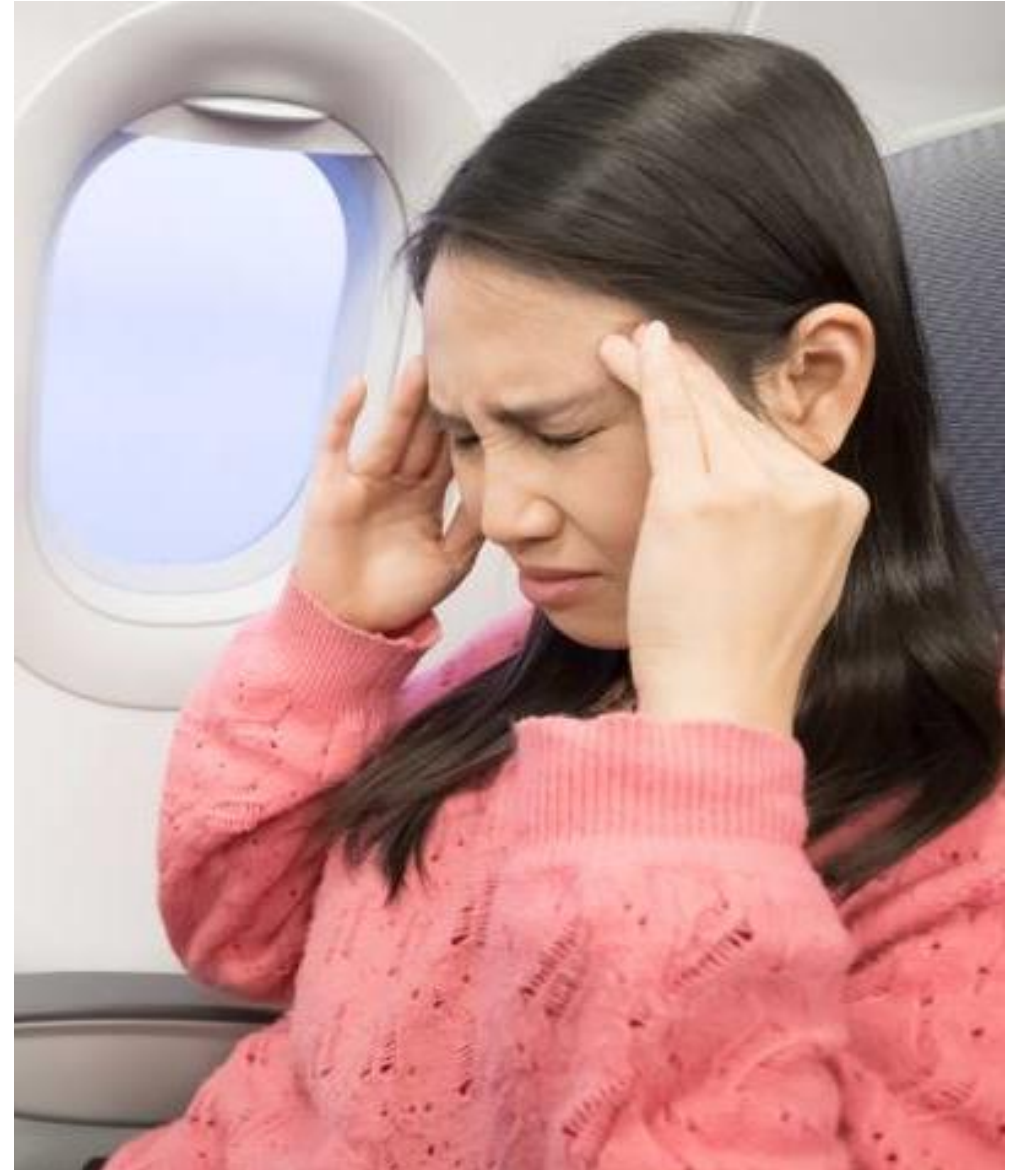
Lesser problems when aircraft is climbing vs landing.



FEELING DRUNK

Lower oxygen levels at higher altitudes make you feel lighter headed, mimicking the feeling of being drunk.

“Oxygen partial pressure drops [in an aircraft cabin], creating a mild hypoxia, which can cause headaches in some susceptible individuals”



FEELING BLOATED

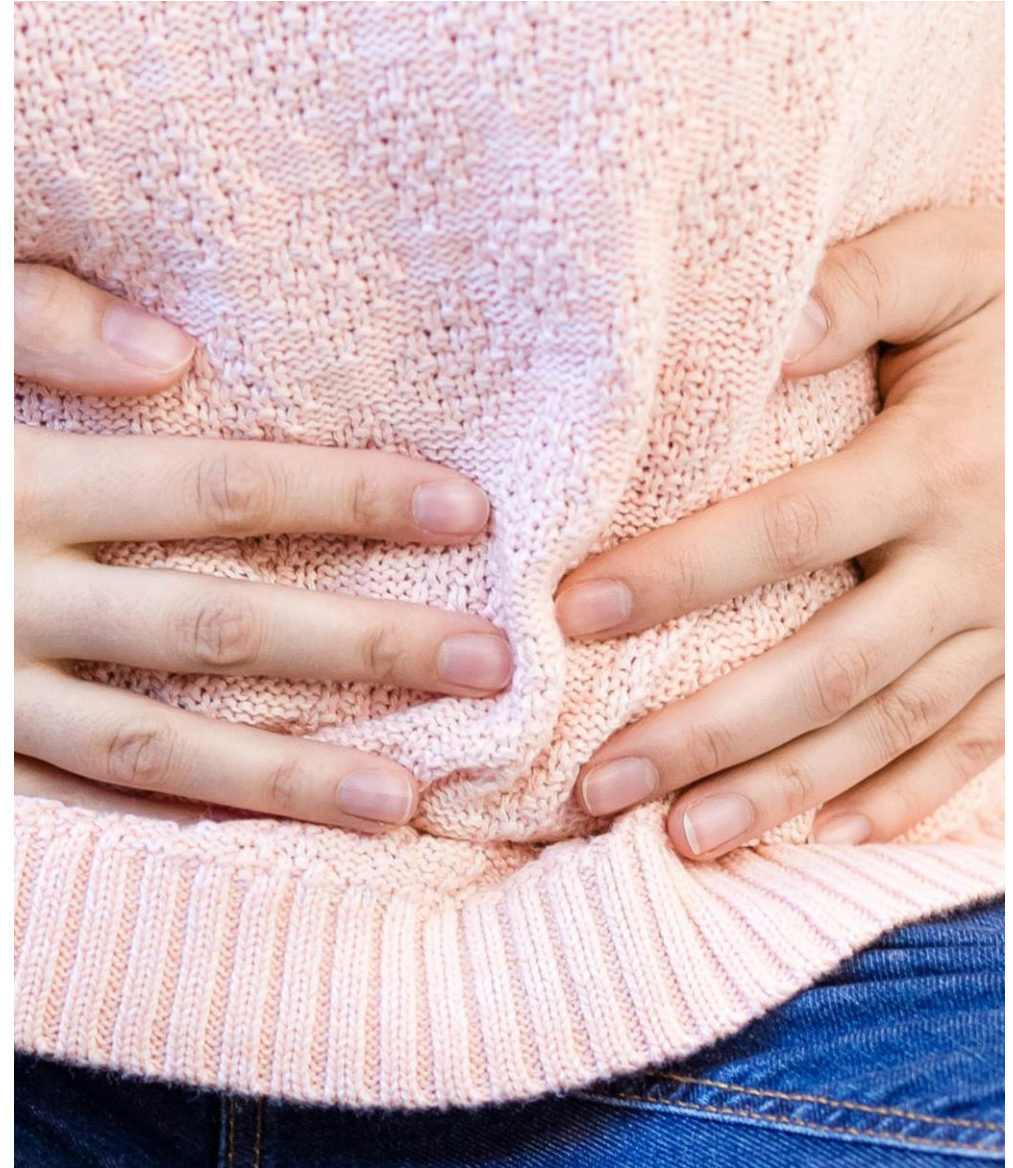
Like a bag of peanuts mid-flight, air pressure changes can cause you to inflate.

Build-up of gas can lead to bloating, constipation and stomach pains.

Lower pressure causes our bowels to expand making us feel gassy and bloated.

Increases the amount of potential flatus.

The Aerospace Medical Association says our body's gas can expand up to 25 percent!



NUMB TASTE BUDS

According to a 2010 study conducted by Germany's Fraunhofer Institute for Building Physics, commissioned by German airline Lufthansa:

Combination of dryness and low pressure reduces the sensitivity of taste buds to sweet and salty foods by around 30%

Interestingly, sour, bitter and spicy flavours are almost unaffected.

Loud noises enhances flavour of umami



NUMB TASTE BUDS

A 2015 study by Cornell University's Food and Brand Lab showed that in an airplane cabin with a routine background noise of more than 85 decibels.

“Noise condition had no influence on intensity ratings for salty, bitter, and sour tastes. However, taste intensity was suppressed for sweet solutions at all concentration levels, and enhanced for umami solutions at higher concentrations, in the air cabin noise condition.”



NUMB TASTE BUDS

Dehydrated person will produce lesser saliva.

Dry cabin also causes saliva to evaporate faster.

Dry cabin dries up your nose, and subdues the sense of smell.

Dry, rarefied air also cools down food faster, which can alter and reduce perception of taste.



LEADS TO...

Umami-rich menu - more spinach, mushrooms, soy sauce.

Additional salt and seasoning.

“Vibrant flavours and spices”

Huge popularity of Tomato juices & Bloody Marys.



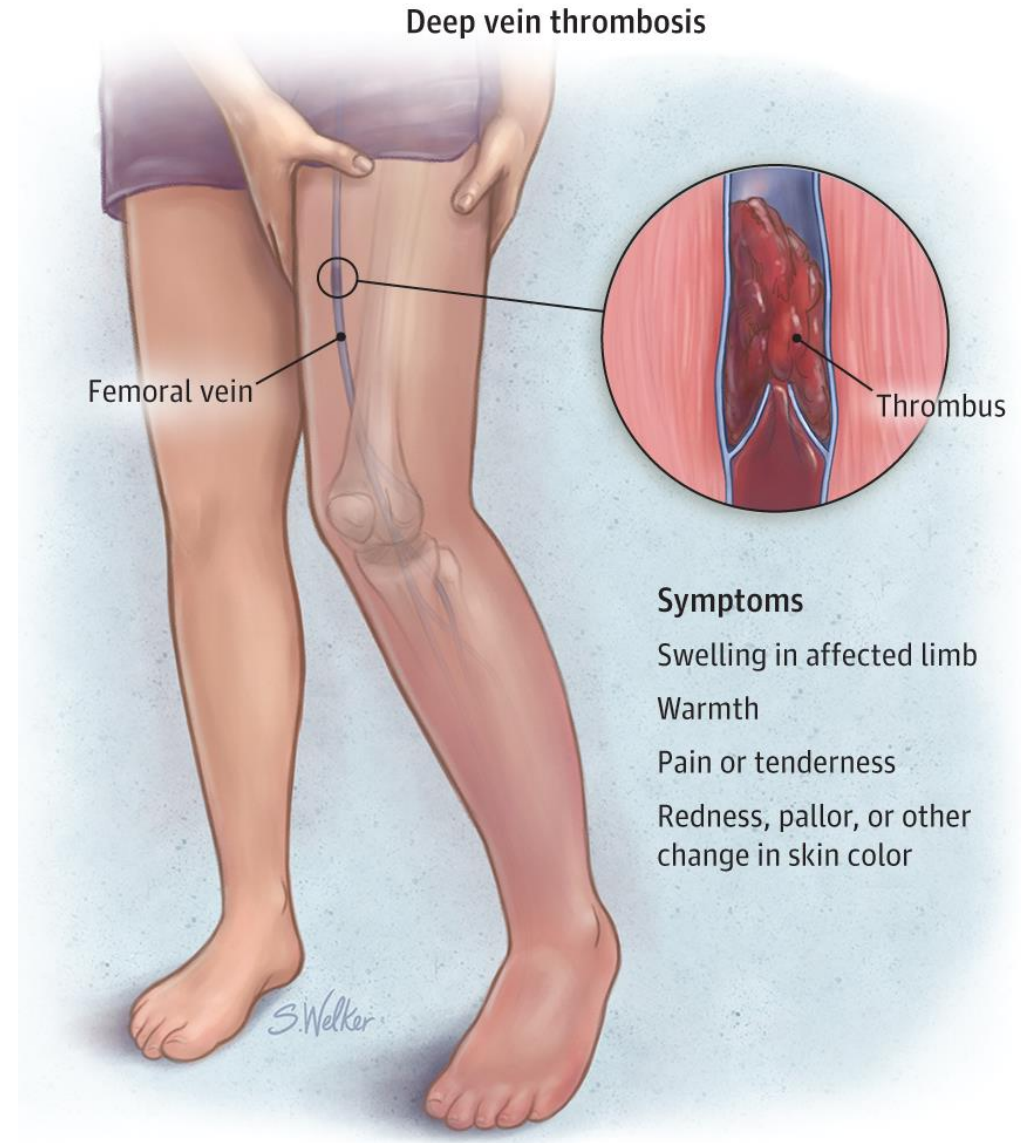
BLOOD CLOTS

Deep Vein Thrombosis (DVT).

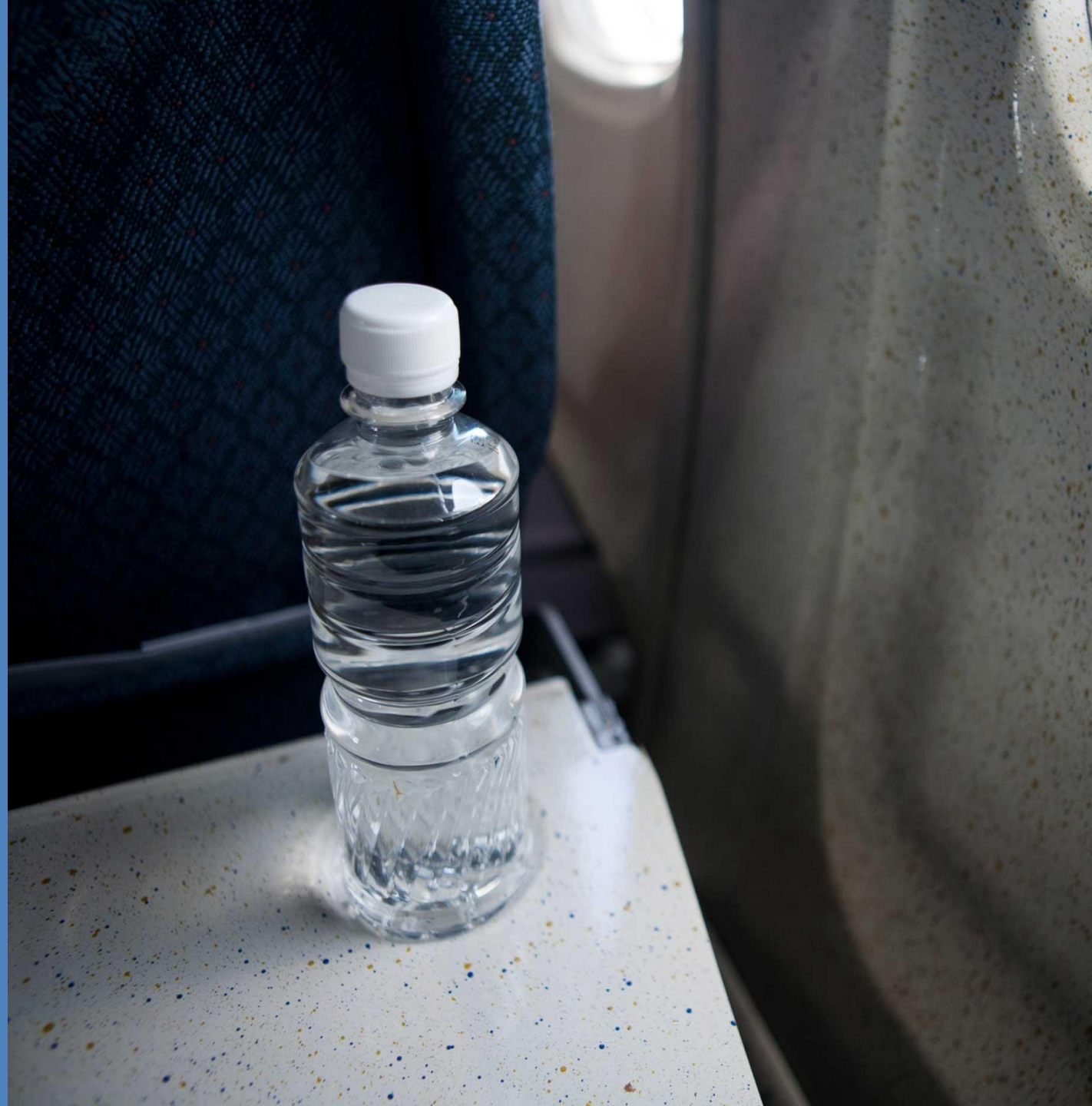
Longer the flight, longer the risk.

Usually DVT will dissolve and go away.

Serious cases can cause pain, swelling, and warmth of the affected leg, or it can break off and travel to the blood vessels of your lungs, causing pulmonary embolism (PE).



THE SOLUTION IS...
HYDRATION!!!



HYDRATE WITH WATER

Key to is replace lost water & electrolytes.

Avoid coffee, tea, soda, and alcoholic drinks. They're diuretics, which means they can dehydrate you more because they all pull water from your body.

[According to the Aerospace Medical Association](#), you should **drink about eight ounces of water for every hour you're in the air.**



NO CHUGGING!

Drink too much water too fast, you dilute your blood.

This causes your kidneys to excrete water faster, and that means you're peeing out all that water before your body can use it to hydrate itself.



AVOID CARBONATED DRINKS

Avoid fizzy carbonated drinks before boarding.

Avoid foods that cause bloating e.g. beans.



AVOID ALCOHOL

Many recommend to drink a glass of water while drinking alcohol to help avoid the effects of a hangover, however a recent study may have quashed this old wives' tale.

Drink water instead of alcohol — not in addition to it.



THE TOYNBEE MANOEUVRE.

Pinch your nostrils shut and close your mouth while swallowing. (**Sipping water makes this easier.**)



MAGNESIUM VS THROMBOSIS

Inhibits blood clotting, protects
against thrombosis.



CONCLUSION

The inflight environment is hostile.

But keeping well hydrated can help to ease your discomfort!

Drink water from a natural source with minerals to replace lost electrolytes!

