



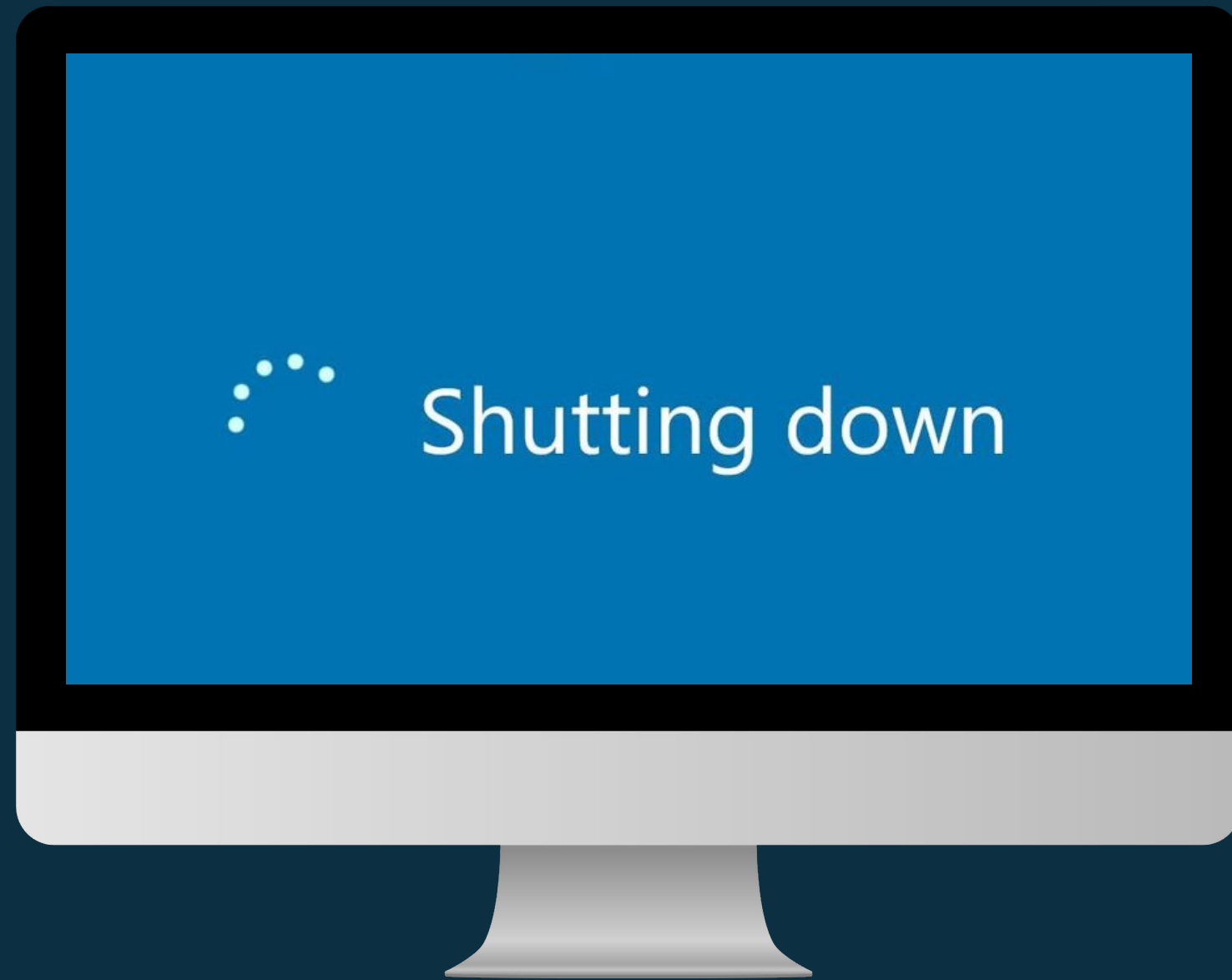
THE HIDDEN

RISK:

Dehydration starts
before the shift

Dr Doug Potter





“I realized I was dehydrated when I stood up too fast, and my body did the Windows *shutting down* sound.”

Tum dum dum



HEAT, WORK, AND FATIGUE: A DANGEROUS

South African mines face a powerful combination of environmental and physiological challenges that compound one another. Understanding how these factors interact is essential for maintaining safety standards and protecting

Heat Stress
Elevated temperatures lead to dizziness, confusion and impaired judgement – compromising worker safety in critical moments

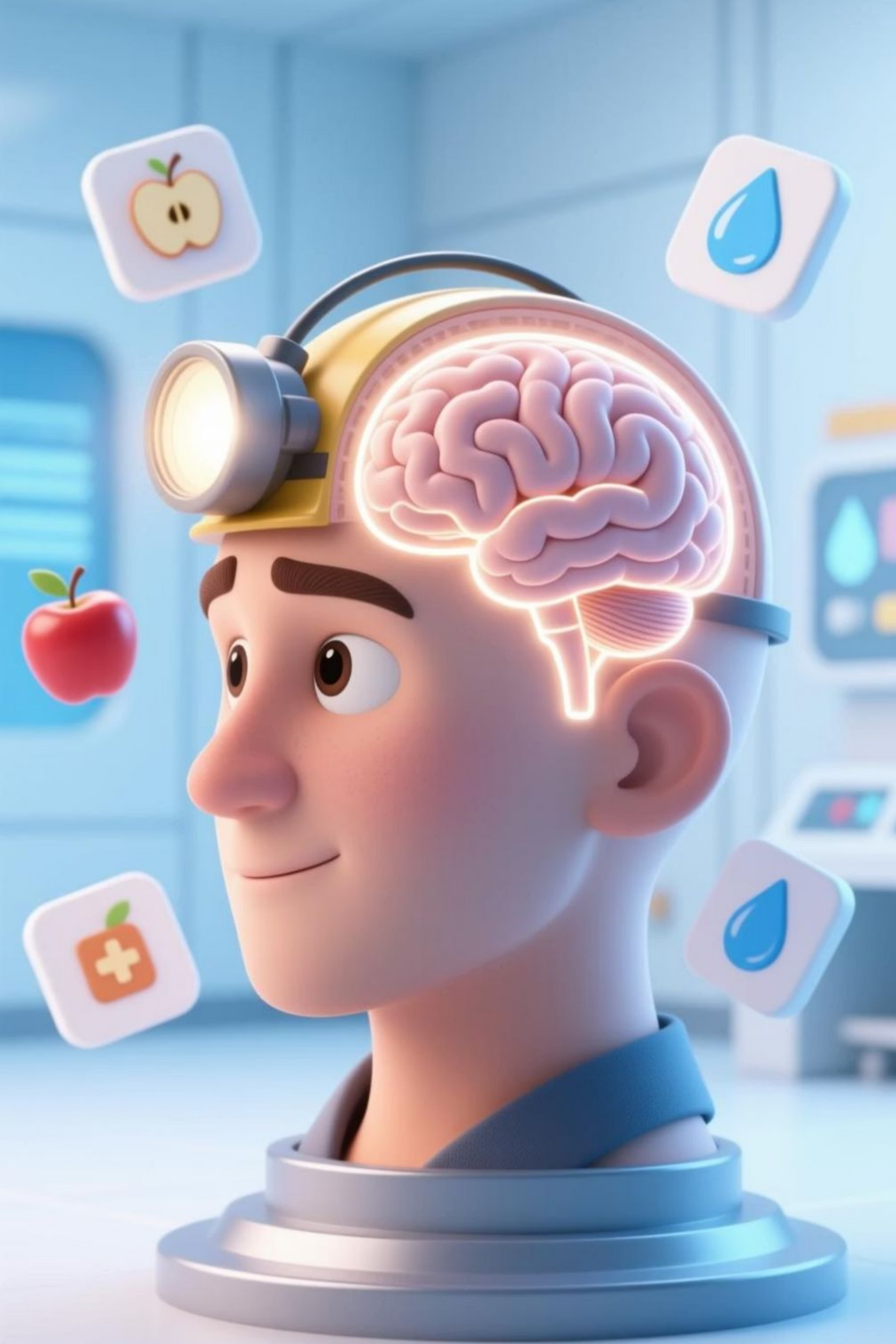
Dehydration
Fluid loss results in slower reaction times, muscle fatigue, and reduced

Fatigue
Exhaustion deteriorates decision making abilities and reduces alertness, creating dangerous conditions underground.

Deep-level conditions
Mines can reach 35°C+

Exponential effect
Dehydration accelerates fatigue rapidly

PPE Impact
Restricts cooling and increases heat load



NUTRITION AND THE BRAIN: SAFETY STARTS FROM WITHIN

Proper nutrition is the foundation of cognitive function and physical performance.

What miners eat before and during their shifts, directly impacts their ability to work safely in demanding environments.

Iron

Essential for oxygen transport and stamina. Improves endurance during physically demanding shifts in hot conditions.

Magnesium & B-Vitamins

Support nervous system function and energy metabolism. Critical for maintaining sharper focus and mental clarity underground.

Low GI meals

Provide steady, sustained energy release throughout shifts. Prevent dangerous blood sugar crashes and impair judgement.

POOR DIET

= poor judgement

= higher incident risk

Sodium & Potassium balance

These must stay in balance to keep your cells working — dehydration disrupts this balance and can become dangerous.

SURFACE VS UNDERGROUND:

Whether under the sun or deep underground
TWO WORLDS, ONE THREAT
— dehydration remains a shared danger.

OPEN-CAST MINES

Key Risks: Sun exposure, dust,
direct heat

Concern: Electrolyte loss leading
to heat cramps and dizziness

UNDERGROUND MINES

Key Risks: High humidity,
trapped heat

Concern: Fluid loss of 2–3 litres
per shift, extreme heat cramps

! Many miners still enter the cage with only
one bottle of water yet lose up to 3 litres per
shift





CHRONIC CONDITIONS: HIDDEN MULTIPLIERS OF

RISK Diabetes and hypertension magnify dehydration and heat risk — small nutrition errors can have deadly consequences.

DIABETES

Risk: Sugar drinks cause glucose spikes and fatigue

Solution: Low-GI snacks, consistent hydration

HYPERTENSION

Risk: Fluid loss causes electrolyte imbalance

Solution: Regular hydration,
reduced sodium

SEMDSA** *recommends low-GI meals and hydration plans for active workers.*

WATER VS

In high-humidity underground environments, drinking water alone is insufficient. Workers need proper electrolyte replacement to maintain safety and performance.

ELECTROLYTES

Why water alone falls short

- Heavy sweating depletes sodium and potassium
- Plain water dilutes remaining minerals
- Can lead to hyponatraemia in extreme cases
- Doesn't restore optimal blood volume quickly

The Electrolyte advantage

- Hydrates tissues **20–30% faster** than water
- Restores critical mineral balance
- Improves alertness and reaction times
- Reduces muscle cramps and fatigue
- Maintains cognitive function under stress

**Best solution: Water + electrolytes =
*safer, stronger, more alert miners***





FROM COMPLIANCE TO CULTURE

Regulations protect, but culture saves lives. Mines that act beyond compliance see measurable improvements in safety and performance.

HYDRATION MAPPING

- Cool water stations in all work areas

EDUCATION

- Educate all personnel on recognizing dehydration symptoms and proper fluid intake

NUTRITION REDESIGN – PROVIDE HEALTHY

OPTIONS *Low-GI electrolyte drinks*

- *Low-GI high-protein shakes*



Hydration and nutrition are invisible PPE

Without them, even the best equipment can't prevent accidents

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