MINDFUL DIVING INSTITUTE · EVIDENCE DOSSIER

FOR DIVE PROFESSIONALS · 2ND EDITION · NOVEMBER 2026

MINDFULNESS AND DIVING

Why presence *is safety*



35 LINKED SOURCES · ACCIDENT DATA TO 2025

What accident analyses from four continents and the latest research on attention, anxiety and stress say. Every figure carries its source. · Luis Miguel Gallardo · Mindful Diving Institute

How to read this dossier

INCIDENT DATA

Analyses of real accidents

They describe what fails and in what order. They do not test solutions.

STRONG EVIDENCE

Meta-analyses and large trials

Results repeated across many studies and people.

MODERATE EVIDENCE

Small trials or large observational studies

A good signal, with limits of size or design.

PRELIMINARY EVIDENCE

Pilots and exploratory studies

Promising signals that still need confirming.

WHAT WE DO NOT CLAIM

There is not yet a large trial showing that mindfulness reduces diving accidents.

There is solid data on how accidents happen and solid evidence on what mindfulness trains. This dossier joins the two and marks with "MDI READING" where the data end and our working hypothesis begins.



PART 1

What goes wrong underwater

What accident analyses say, from DAN's classic study to the 2025 reports, and what research on panic shows.

The chain of a fatal accident

THE CLASSIC STUDY · n = 947

Recreational open-circuit scuba deaths, 1992–2003. Still the largest step-by-step analysis published; recent studies use the same model.

1 TRIGGER

What starts the problem

41%	Insufficient gas
20%	Entrapment
15%	Equipment problem

2 DISABLING AGENT

What makes it dangerous

55%	**Emergency ascent**
27%	Insufficient gas
13%	Buoyancy trouble

3 DISABLING INJURY

What disables the diver

33%	Asphyxia
29%	Arterial gas embolism
26%	Cardiac incident

4 CAUSE OF DEATH

What is recorded as the final cause

70%	Drowning
14%	Arterial gas embolism
13%	Cardiac incident

SOURCE [1] Denoble et al., 2008 · Undersea & Hyperbaric Medicine

What has changed: the most recent analyses

Study	Period · deaths	What starts it	What makes it dangerous	Diver profile
Denoble et al. · USA and Canada [1]	1992–2003 · 947	Insufficient gas 41%, entrapment 20%	Emergency ascent 55%	*Baseline for comparison*
Lippmann and Taylor · Australia [2]	2001–2013 · 126	Environment 54%, exertion 18%, gas 12%	Medical 38%, ascent 17%, buoyancy 14%	Mean age 44; prior health a factor in 47%
Lippmann et al. · New Zealand [3]	2007–2016 · 48	Gas 35%, environment 35%, exertion 17%	Mostly medical (cardiac); embolism after out-of-gas ascents	Mean age 47; medical risk factors in 77%
Lippmann et al. · Australia [4]	2014–2018 · 42	Mostly environment and exertion	Mostly medical (cardiac)	Mean age 49.7 (6 years older); obesity in 54%
Casadesús et al. · Girona, Spain [5]	2009–2018 · 25	Exertion, panic, buoyancy, disorientation	Rapid ascent, cardiac event, panic	Mostly men aged 50 to 69
BSAC · United Kingdom [6]	2025 · 9	Not enough information in over half	One confirmed case of immersion pulmonary oedema	Mean age 55

MDI READING *The profile is changing: older, more cardiac. Ascent and gas are still in the chain, but what the diver brings into the water now matters too.*

SOURCES [2] Lippmann and Taylor, 2020 · [3] Lippmann et al., 2021 · [4] Lippmann et al., 2023 · [5] Casadesús et al., 2019 · [6] BSAC, Incident Report 2025

THE FIGURE THAT CHANGES THE CONVERSATION

96% of arterial gas embolisms involved an emergency ascent.

Denoble et al., 2008 · 947 deaths, 1992–2003. No later study has repeated this exact figure.

2024 · In 288 accidents treated by the Royal Netherlands Navy (1966–2023), ascent was the most frequent disabling agent (52%), mostly ascending too fast, and embolism was the most lethal injury.

MDI READING *What turns a problem into an injury is often the reaction. Between stimulus and response there is a space, and that space can be trained.*

SOURCES [1] Denoble et al., 2008 · Undersea & Hyperbaric Medicine · [7] Turner et al., 2024 · Diving and Hyperbaric Medicine

Knowing is not enough: behaviour in the moment counts

INCIDENT DATA · n = 122

Non-training diver deaths in North America and the Caribbean: had accepted safe practices been broken?

45%

of all deaths involved at least one violation of safe diving practice.

75%

of deaths without a medical cause involved violations, against 23% of deaths with a medical cause.

×7.3

higher odds of a violation in deaths without a medical cause (95% CI: 2.3–23.2).

MDI READING *Rules are learned on the course; they are applied, or not, in the moment. Presence is the bridge between what you know and what you do underwater.*

SOURCE [8] Shreeves et al., 2018 · International Maritime Health

The new front: heart, age and fitness

≥ 1 in 4

diving deaths are heart-related. Cardiovascular disease appears to be increasing among divers.

[9] Lippmann and Caruso, 2024

77%

of those who died in New Zealand (2007–2016) had prior medical risk factors, mainly ischaemic heart disease.

[3] Lippmann et al., 2021

54%

of those who died in Australia (2014–2018) were obese; every identified cardiac death involved a pre-existing condition.

[4] Lippmann et al., 2023

55 years

was the mean age of divers who died in the United Kingdom in 2025.

[6] BSAC, 2026

MDI READING *Presence is also honesty with your body. The readiness scan before entry (green · amber · red) makes it easy to say "amber today". Postponing is fine too. It does not replace medical fitness: it adds to it.*

SOURCES [9] Lippmann and Caruso, 2024 · [3] Lippmann et al., 2021 · [4] Lippmann et al., 2023 · [6] BSAC, Incident Report 2025

Panic: common, dangerous and predictable

24–37%

One in four has been there

In the largest published survey (12,087 divers), 24% of men and 37% of women had felt panic while diving. 15% made a rapid or uncontrolled ascent in their first episode.

83%

Prior anxiety predicts it

Measuring trait anxiety before the course correctly predicted panic behaviour in 35 of 42 students; 11 had two or more episodes.

2025

Still in the reports

The 2025 UK report again describes divers who “started to panic and headed for the surface”.

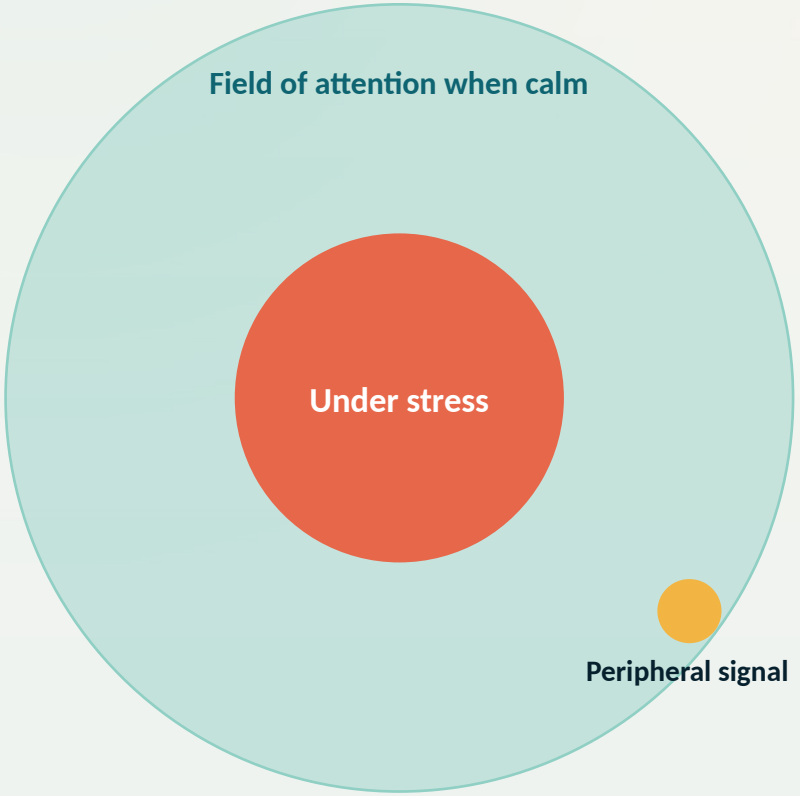
THE GAP MORGAN POINTED OUT

Relaxation, meditation, hypnosis and imagery had not yet produced consistent results in anxious divers.

He called for systematic research on their efficacy. It is the gap the MDI wants to help close: that is why we measure in every course.

SOURCES [10] Colvard and Colvard, 2003 · [11] Morgan, Raglin and O'Connor, 2004 · [6] BSAC, Incident Report 2025 · [12] Morgan, 1995

Under stress, attention narrows



CLASSIC EXPERIMENT · 1966

Perceptual narrowing

Novice divers had to detect a peripheral light while doing a central task. On the surface it did not interfere; underwater, a subgroup responded much more slowly to the peripheral light.

2020 · 27 DIVERS · AT 5 METRES

With high trait anxiety, slower underwater: 72.5 s vs 64.4 s on an attention test (Stroop) and 10.8 s vs 7.1 s to clear the mask.

MDI READING *Underwater, the periphery is your buddy, your gauge and the surroundings. MDI trains broad, steady attention: one single cue and an open gaze.*

SOURCES [13] Weltman and Egstrom, 1966 · Human Factors · [14] Tsai et al., 2020 · Diving and Hyperbaric Medicine

Continuous breathing is physics, not style

1.5 m

A breath-hold ascent of only 5 feet (≈1.5 m) in shallow water may be enough to cause an arterial gas embolism.

≈ 1/3

At 3.4 m you breathe gas at 1.33 ATA: if it is held while surfacing, it expands by about a third.

> ***"Breathe continuously, especially in shallow water."***
>
> Conclusion of the DAN article

THAT IS WHY THE MDI CANON

- Habitual, continuous breathing at all times.
- No breath-holds, no paced breathing, no prolonged exhalation.
- TRES: three normal breaths, simply observed, once neutral and stable.
- Nothing added during descent, ascent or task-critical phases.

SOURCE [15] Gessert, 2021 · DAN Alert Diver



PART 2

What mindfulness trains

What research has measured out of the water: attention, anxiety and stress recovery.

What mindfulness is, in operational terms

OPERATIONAL DEFINITION · [16]

1. **Self-regulating attention to keep it on immediate experience.**
2. **Doing so with an attitude of curiosity, openness and acceptance.**

It is not relaxing or emptying the mind: it is trained attention.

FOUR MECHANISMS · [17] → IN THE WATER (MDI TRANSLATION)

1. **Attention regulation**
   Underwater: holding the plan, the cue and your buddy.
2. **Body awareness**
   Underwater: noticing tension, cold or fatigue earlier.
3. **Emotion regulation**
   Underwater: feeling the alarm without obeying the first impulse.
4. **Change in perspective on the self**
   Underwater: "I am feeling fear" rather than "I am the fear".

SOURCES [16] Bishop et al., 2004 · Clin Psychol Sci Pract · [17] Hölzel et al., 2011 · Perspectives on Psychological Science

Anxiety and stress: the strongest evidence

STRONG EVIDENCE · RANDOMISED TRIAL AND META-ANALYSES

HOGE ET AL., 2023 · JAMA PSYCHIATRY · [18]

= medication

276 adults with anxiety disorders, randomised: 8 weeks of MBSR were as effective as escitalopram, a first-line medication.

Adverse events: 15% with MBSR vs 79% with the medication.

GALANTE ET AL., 2021 · PLOS MEDICINE · [19]

g = 0.56

136 trials and 11,605 adults without a diagnosis: less anxiety than no intervention (moderate effect).

Against non-specific control activities: g = 0.47.

GOLDBERG ET AL., 2022 · [20]

44 meta-analyses

336 trials and 30,483 people: better than no intervention in almost every comparison, and similar to evidence-based treatments.

The broadest review of reviews to date.

Reading g: ≈ 0.2 small effect · ≈ 0.5 moderate · ≈ 0.8 large

MDI reading: if prior anxiety predicts panic, training anxiety is training safety.

SOURCES [18] Hoge et al., 2023 · JAMA Psychiatry · [19] Galante et al., 2021 · PLoS Medicine · [20] Goldberg et al., 2022 · Perspectives on Psychological Science

Attention under pressure: protecting it can be trained

META-ANALYSIS · 111 TRIALS

Better attention, measured

Zainal and Newman, 2024 · [21]

9,538 people. Mindfulness improved executive attention, sustained attention and working-memory accuracy, also against active controls (g = 0.19 to 0.39).

Small-to-moderate, consistent effect

CONTROLLED TRIALS

It protects the mind under stress

Jha et al., 2010 and 2020 · [22] [23]

Military personnel in weeks of high stress: without training, working memory and attention fell. With mindfulness they fell less, and in 2010 they rose in those who practised most.

48 and 80 service members · 8 weeks

EXPERIENCE SAMPLING

The mind wanders almost half the time

Killingsworth and Gilbert, 2010 · [24]

In 2,250 adults, the mind was elsewhere in 46.9% of sampled moments, and people felt worse while mind-wandering.

Samples collected by phone in daily life

SOURCES [21] Zainal and Newman, 2024 · [22] Jha et al., 2010 · [23] Jha et al., 2020 · [24] Killingsworth and Gilbert, 2010

It does not switch off the alarm: it speeds the return

CONTROLLED TRIAL · n = 281

Marines: 8 weeks of mindfulness (20 h) before highly stressful combat training. Compared with controls:

d = 0.43 reacted slightly more strongly (heart rate)

d = 0.67 heart rate recovered sooner

d = 0.93 breathing rate recovered sooner

They also showed lower activation in the right insula and anterior cingulate. It is a measured outcome, not a technique: underwater, habitual and continuous breathing.

META-ANALYSIS · 45 STUDIES

The body notices too

Overall, meditation practice lowered physical markers of stress: cortisol, systolic blood pressure, heart rate and C-reactive protein, across very different populations.

SOURCES [25] Johnson et al., 2014 · American Journal of Psychiatry · [26] Pascoe et al., 2017 · Journal of Psychiatric Research

Precision sport: better performance, not just calm

TWO META-ANALYSES · 2017 AND 2024

1.35

Precision sports (2017)

Shooting and darts: 9 trials, 290 athletes. High variability between studies (I^2 = 82%).

0.55

Sports performance (2024)

18 studies and 922 athletes: the mindfulness-acceptance approach improved performance (g = 0.55).

MDI READING

Buoyancy control is a precision sport.

Small adjustments, steady attention, no hurry. It is the kind of task where mindfulness has already shown an effect in other sports. A promising result, not a definitive one.

SOURCES [27] Bühlmayer et al., 2017 · Sports Medicine · [28] Du and Ning, 2024 · Frontiers in Psychology



PART 3

Diving and mind

What has already been measured with divers: small, promising studies.

Studies with divers: signals, and a 2026 trial

Study	Design and sample	Result	Level
Beneton et al., 2017 [29]	1-week scuba course (37) versus multisport course (30). Not randomised.	Perceived stress fell in the divers and was still lower at one month; mindfulness scores rose. The difference between groups was not significant.	PRELIMINARY
Gibert et al., 2022 [30]	Randomised pilot: meditative diving (10 dives) versus multisport. 34 adults with PTSD.	At one month, fewer intrusive memories with diving (−5.1 versus −2.2). Other differences were not significant and did not last to 3 months.	PRELIMINARY
Griffiths et al., 2026 [31]	Randomised trial in France: diving with mindfulness exercises (10 sessions) vs usual care. 63 adults with obesity.	Less emotional eating (−0.82 vs −0.27), less perceived stress and better quality of life. No diving incidents.	MODERATE
Zec et al., 2022 [32]	29 divers (recreational and military), dive to 30 m. Salivary cortisol and questionnaires.	Prior negative emotions predicted cortisol before the dive. Recreational divers had higher cortisol than military divers.	PRELIMINARY
Carreño et al., 2020 [33]	176 divers versus 70 beach users at Cap de Creus. Before and after the activity.	Mood improved in both groups; after adjustment, no significant difference between diving and being on the beach.	MODERATE

SOURCES [29] Beneton et al., 2017 · [30] Gibert et al., 2022 · [31] Griffiths et al., 2026 · [32] Zec et al., 2022 · [33] Carreño et al., 2020

Water counts too

OBSERVATIONAL · n = 19,806

×1.59

higher odds of good health with 120–179 minutes a week in nature, versus none.

High wellbeing: ×1.23. The benefit levels off between 200 and 300 minutes.

White et al., 2019 · [34]

META-ANALYSIS · BLUE SPACES

d = 0.19

effect of contact with blue spaces (sea, rivers, lakes) on psychological restoration: stress, mood and wellbeing.

More blue space nearby: d = 0.34.

Georgiou et al., 2021 · [35]

MDI READING *Diving joins two things the evidence links to wellbeing: time in the water and trained attention.*

SOURCES [34] White et al., 2019 · Scientific Reports · [35] Georgiou et al., 2021 · IJERPH

From data to practice

MDI READING · WORKING HYPOTHESIS

What fails (data)	What mindfulness trains (data)	How the MDI practises it
Emergency ascent: the most frequent disabling agent in 1992–2003 [1] and in accidents treated by the Royal Netherlands Navy [7]	Faster cardiac and respiratory recovery after stress [25]	**Stop, think and act according to your agency training; stop authority in the buddy pair**
Heart and age: at least 1 in 4 deaths is cardiac [9]	Body awareness: noticing tension, fatigue or cold sooner [17]	**Readiness scan (green · amber · red); postponing is fine too**
Panic: 24% to 37% have experienced it, and prior anxiety predicts it [10] [11]	Less anxiety, as effective as a first-line medication [18]	**ARRIVE before entry: “Acknowledge” your state**
Tunnel vision; with anxiety, slower processing underwater [13] [14]	Better sustained attention and working memory, also under stress [21] [23]	**One single cue per dive and an open gaze**
Violations in 75% of deaths without a medical cause [8]	Less mind-wandering, more attention on the task [24]	**"Verify": plan, signals and return with your buddy**
Holding your breath on ascent can cause an embolism [15]	*Breathing is not trained: it is only observed*	**Habitual, continuous breathing; TRES only observes**

Numbers in brackets refer to the source list at the end.

What we do not know yet, and how we measure it

1. There is not yet a large trial measuring the effect of mindfulness on diving accidents.
2. Studies with divers are small, often non-randomised, with self-selected participants.
3. Mindfulness does not replace your agency training, the dive plan, equipment or medical fitness: it adds to them.
4. Many deaths cannot be reconstructed: in the 2025 UK report information was missing in over half. Accident data are imperfect.

THAT IS WHY WE MEASURE

FP20 · Fundamental Peace

A 20-item questionnaire before and after every course, with your personal code and optional research consent.

The research is carried out with the Chair in Contemplative Sciences at the University of Zaragoza.

mindfuldivinginstitute.com/learn/profile

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Calm can be trained.
So can presence.

Mindful Diving™ adds to your agency training; it does not replace it.

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