

STATISTICAL AVERAGES DON'T SUFFER TRAUMATIC BRAIN INJURY (TBI) FROM BLAST. PEOPLE DO.

AGGREGATE BLAST METRICS UNDERMINE OCCUPATIONAL EXPOSURE LIMIT DEVELOPMENT AND MASK HIGH-RISK INDIVIDUALS



THE PROBLEM

Current blast risk management relies on aggregate metrics that hide high- risk individuals.

Outliers are not data points... they are warfighters.

TEAM AVERAGE 24-hr Cumulative Impulse 17.9 psi-ms	HIGHEST INDIVIDUAL 24-hr Cumulative Impulse 70.38 psi-ms
Below Guidance (31.7 psi-ms / day)	Above Guidance (31.7 psi-ms / day)
LOOKS SAFE	NOT SAFE

ORDER OF MAGNITUDE VARIATION WITHIN A SINGLE TEAM

EXTREME INDIVIDUAL VARIABILITY

Blast exposure follows a right-skewed distribution. A small number of individuals receive disproportionately high doses.

THE STATISTICAL OUTLIER HAS A NAME, A FACE, AND A BRAIN.
Don't let aggregate data make them invisible.

KEY FINDINGS

Extreme variability was the rule, not the exception
Operators performing the same task, at the same time, using the same explosive charges experienced dramatically different blast exposures. Within a single team exposed to the same serials, 24-hr cumulative impulse ranged from 7.52 to 70.38 psi-ms. Individual risk cannot be reliably inferred from team averages.

7.52 – 70.38
psi-ms

Aggregate Metrics Mask Individual Risk
Team average (17.19 psi-ms) suggested low risk, yet individual exposures varied by more than an order of magnitude, meaning the highest-risk operators remained hidden within “safe” averages.

17.9
team average
psi-ms

Dose Links to Response
High-exposure individuals were more likely to show cognitive performance patterns consistent with recent blast research conducted by WRAIR. Changes in miRNA biomarkers associated with neuroinflammatory response were also observed.

Dose Response Linked

Blast Buddy helps you safely plan blast exposures. Predictive algorithms highlight risk before harm, enabling training to be adapted to protect warfighter brain health without compromising operational capability.

BLAST BUDDY TURNS DATA INTO ACTION – IN REAL TIME

Plan

Operational context, team positioning, prior exposure, weapon and ammunition, explosives.

Predict

Predict individual exposure before each event, prior to harm.

Measure

Wearable B3 BlastGauges measure each individuals dose.

Cognition

FDA Cleared, Validated Cognitive Assessments by DANA.

Biomarkers

miRNA biomarkers by GLIA Diagnostics provide physiological insight into neuroinflammation.

Decision Support

Integrated AI/ML provides real-time decision support, enabling commanders and clinicians to adjust and protect.

STUDY OVERVIEW: Multi-Agency, Multi Modal Blast Exposure Study

Australian Defence Force and 9 Law Enforcement Agencies

Observational study

3 months duration

22 participants

- ✓ Ethics approval & informed consent
- ✓ Blast dose monitoring - B3 Blast Gauge
- ✓ Neurocognitive assessment - DANA
- ✓ Biomarker collection & analysis - GLIA Diagnostics
- ✓ Operational governance & risk management - Blast Buddy
- ✓ Analysis & reporting - Invicta Prospects Group

THE DATA: EXTREME INTRA-TEAM VARIABILITY AND MEASURABLE COGNITIVE CHANGES

Same team. Same serials. Same day. Different exposure. ONE SIZE DOES NOT FIT ALL

*** Visible with BLAST BUDDY Representative DANA result showing measurable cognitive performance changes after high cumulative exposure

OPERATIONAL IMPACT

WITHOUT INDIVIDUAL MANAGEMENT

Treat everyone the same based on the average

Assume worst-case scenario every time

CAPABILITY IS COMPROMISED. HARM IS ASSURED.

WITH INDIVIDUAL MANAGEMENT

By predicting risk before harm, Blast Buddy enables commanders to alert, adapt, monitor, and protect warfighter brain health WITHOUT COMPROMISING CAPABILITY

Predict Alert Adapt Monitor Maintain Capability

MANAGE RISK & PROTECT WARFIGHTER BRAIN HEALTH WITHOUT COMPROMISING CAPABILITY

Interested in collaborating?

We welcome opportunities to collaborate with defence, law enforcement, researchers, healthcare providers, and industry partners advancing blast exposure management and warfighter brain health.

Disclaimer

Blast Buddy is a commercial product developed by Invicta Prospects Group. The scientific findings presented are based on operational data collected as part of the study. The views expressed are those of the authors and do not necessarily represent the official positions of participating organisations.

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TAKE HOME MESSAGE: Blast doesn't injure averages. It injures people. Protecting operators requires individual exposure management, not population statistics.

BLAST BUDDY

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