NDIS Evidence Advisory Committee Consultation January 2026 - Hyperbaric Oxygen Therapy

Prepared by Cerebral Palsy Alliance

For the NDIS Evidence Advisory Committee

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Cerebral Palsy Alliance Submission to the NDIS Evidence Advisory Committee: Hyperbaric Oxygen Therapy

About Cerebral Palsy Alliance

Cerebral Palsy Alliance (CPA) has evolved to become a global leader in cerebral palsy (CP), bringing together leading services, research, advocacy and technology to improve the lives of people with CP and their families at every stage of life. CPA's dedicated research institute is instrumental in privately funding research into CP leading to reduced rates and severity of the condition in Australia.

Founded in 1945, CPA delivers life-changing services to thousands of children and adults across New South Wales and the Australian Capital Territory, employing more than 225 allied health professionals in a staff cohort of over 2500.

CPA's service model integrates clinical expertise with research translation through the Cerebral Palsy Alliance Research Institute, a global leader in neurorehabilitation and early intervention research. CPA's affiliation with research institutions such as the University of Sydney enables real-world implementation of best practice in exercise, motor learning, and functional outcomes for people with disability.

Under CPA's Strategy 2030 framework, our mission is to maximise functional independence, participation, and lifelong health for people with cerebral palsy and similar conditions. It is also under our framework to share and integrate the evidence base for CP into everyday therapeutic practice.

Cerebral Palsy Alliance welcomes the opportunity to respond to the NDIS Evidence Advisory Committee consultation on Hyperbaric oxygen therapy (HBOT).

1. Executive summary

Hyperbaric oxygen therapy has been studied in children with cerebral palsy over more than two decades. Multiple systematic reviews and randomised controlled trials show no clinically meaningful benefit of HBOT on core outcomes such as gross motor function or cognition, while documenting a non-trivial rate of adverse events, particularly middle ear barotrauma.

Based on the current evidence, we believe that:

- HBOT should not be funded as a routine, reasonable and necessary support for CP under the NDIS.

- Any use of HBOT in CP should be restricted to ethically approved research studies with rigorous controls and safety monitoring.
- Funding HBOT risks diverting resources from therapies with much stronger evidence (e.g. goal-directed, task-specific physiotherapy and occupational therapy).

2. Description of the intervention and rationale

Hyperbaric oxygen therapy involves inhalation of 100% oxygen in a pressurised chamber (typically 1.5–2.0 atmospheres absolute [ATA]) with the aim of increasing oxygen delivery to tissues.

In cerebral palsy, HBOT is promoted on the hypothesis that enhanced oxygenation may "reactivate" dormant neurons or support repair in chronically injured brain tissue, leading to improvements in motor function, cognition, behaviour and other neurologic symptoms. Families are often offered HBOT in private or alternative therapy settings, frequently at substantial out-of-pocket cost and time burden.

3. Evidence base

3.1 Systematic reviews

A 2007 systematic review of HBOT for CP found that both randomised and non-randomised studies showed similar improvements in HBOT and control groups, concluding there was no reliable evidence of specific benefit from HBOT. Observed gains were likely attributable to non-specific factors such as concurrent therapy, intensive attention and parental engagement (McDonagh et al., 2007).

A more recent systematic review and meta-analysis (Laureau J et al., 2022) identified five randomised controlled trials **(**RCTs) and seven observational studies of HBOT in children with CP. The review reported:

- High-level evidence that HBOT is ineffective for improving motor and cognitive functions; and
- Moderate-level evidence that HBOT is associated with a higher rate of adverse events than pressurised air controls.

The authors concluded that HBOT should not be used in routine clinical practice for children with CP and recommended that any further use be confined to research contexts.

3.2 Randomised controlled trials and functional outcomes

The largest and most frequently cited RCT, a multicentre trial by Collet et al. (2001), randomised 111 children with CP to:

- 40 sessions of 100% oxygen at 1.75 ATA, or
- 40 sessions of hyperbaric air at 1.3 ATA.

Both groups received concurrent intensive rehabilitation. The trial reported comparable improvements in Gross Motor Function Measure (GMFM) scores and other functional outcomes in HBOT and control groups, indicating no specific therapeutic effect of oxygen over pressurised air.

A subsequent double-blind RCT by Lacey et al. (2012) compared 40 sessions of 1.5 ATA 100% oxygen with 1.5 ATA hyperbaric air in 49 children. Over four years of follow-up there were no significant between-group differences in self-care or gross motor outcomes, again suggesting that improvements were not attributable to oxygen dose.

When pooled in the 2022 systematic review, effect estimates for motor and cognitive outcomes showed parallel gains in HBOT and control groups, consistent with non-specific effects of intensive therapy and study participation rather than specific benefit from HBOT.

3.3 Other outcomes and observational data

Evidence for HBOT in other outcome domains is sparse and low quality:

- Very low-certainty evidence from small observational studies suggests possible improvements in sleep disturbances, but these studies lacked appropriate controls and had substantial risk of bias.
- A more recent small trial of 39 children with hemiplegic CP reported long-term improvements in spatiotemporal gait parameters and functional balance following HBOT combined with usual therapy (Khalil et al., 2023). However, the comparison was HBOT plus usual therapy vs usual therapy alone and did not address whether hyperbaric oxygen is superior to hyperbaric air or equivalent-intensity rehabilitation, limiting causal interpretation.

Overall, there is insufficient robust evidence that HBOT improves secondary outcomes such as sleep, gait, behaviour or quality of life beyond what can be achieved with standard multidisciplinary rehabilitation.

3.4 Safety and adverse events

Adverse events are relatively common in HBOT for children with CP, although most are mild and reversible. Across RCTs and observational series:

- Middle ear barotrauma is the most frequently reported complication, affecting up to around half of treated children in some studies, with higher rates in HBOT compared with 1.3 ATA air controls.
- Other reported adverse events include transient myopia, anxiety or claustrophobia in the chamber, and rare seizures attributed to oxygen toxicity (although at CP-typical pressures seizure risk appears low).

Given the absence of clear functional benefit and a non-negligible risk profile, systematic reviews and technology assessments conclude that the overall benefit–harm balance does not support routine use of HBOT in CP.

4. Interpretation and implications for NDIS funding

4.1 Strength and consistency of evidence

- The highest-quality trials (Collet et al., 2001; Lacey et al., 2012) demonstrate no additional benefit of hyperbaric oxygen over pressurised air in children with CP.
- The most comprehensive recent systematic review (Laureau J et al., 2022) rates the evidence for functional benefit as high-certainty negative (i.e. evidence of no effect) and highlights a higher rate of adverse events in HBOT groups.
- Newer small trials suggesting benefit are methodologically weaker and confounded by co-interventions, and do not outweigh the larger, better-designed studies.

4.2 Risks, burdens and opportunity costs

HBOT involves substantial time, financial and practical burden for families, including frequent chamber sessions over several weeks. When delivered through private providers, this typically entails high out-of-pocket costs and travel.

In the context of limited NDIS plan budgets, funding HBOT would divert resources from interventions with strong evidence for improving function and participation in CP, such as goal-directed, task-specific physiotherapy and occupational therapy.

4.3 Policy and guideline perspectives

Guideline-type statements and educational resources based on the current evidence base consistently advise against HBOT as a standard intervention for CP, emphasising:

- Lack of demonstrated specific benefit in large, well-designed trials;

- Risk of adverse events;
- High financial and opportunity cost.

Regulatory and advisory bodies in multiple jurisdictions do not list CP as an accepted indication for HBOT, reinforcing its status as an experimental treatment in this population.

5. Evidence gaps and future research

If further research is pursued, it should:

- Focus on well-powered, multi-centre RCTs with appropriate controls (hyperbaric air or sham conditions), standardised HBOT protocols and concurrent best-practice rehabilitation in both arms.
- Use core outcome sets that prioritise functional and participation outcomes meaningful to children and families (e.g. GMFM, functional mobility, self-care, quality of life).
- Include systematic adverse event reporting and long-term follow-up.

Given existing high-certainty evidence of lack of effect on primary outcomes, any future trials should have clear justification, robust design and independent oversight.

6. Recommendations to the NDIS Evidence Advisory Committee

Based on the current evidence, we recommend that the NDIS Evidence Advisory Committee:

1. Do not endorse HBOT as a reasonable and necessary support for children with CP under the NDIS.
2. Do not fund HBOT for CP in routine clinical practice, including as a core, capacity-building or assistive technology support.
3. Where HBOT is considered, restrict its use to ethically approved, high-quality research studies with appropriate control conditions, pre-specified outcomes and systematic monitoring of adverse events.
4. Encourage investment instead in evidence-based interventions for CP (e.g. early detection and intervention, goal-directed, task-specific physiotherapy and occupational therapy, family-centred participation-focused programs).

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7. Reference list (APA style)

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j) Novak, I, Badawi, N (2012) *Last breath: Effectiveness of hyperbaric oxygen treatment for cerebral palsy* Annals of Neurology Vol 72, Issue 5 (pp 633-634) Editorial. https://doi.org/10.1002/ana.23760