PART XVI – PARA-CYCLING

Changes to Sport Class profiles – Rationale, implications and transition period for National Federations/National Paralympic Committees

Rule changes to Sport Classes H3, H4 and H5

16.5.005.3 Sport Class: H3

Eligible Impairment(s) which prevent an Athlete from using a kneeling/sitting position on a hand-cycle due to underlying health conditions.

Impaired Muscle Power

- Paraplegic with impairments corresponding to a motor complete lesion from Th1 to ~~Th10~~ L1;
- Trunk stability varies from very limited trunk stability (Nil to minimal muscle strength in abdominals) to ~~limited~~ normal trunk stability;
- No lower limb function
- Non-spinal cord injury/incomplete spinal cord injury with a sport specific activity limitation equivalent to sport class H3.

Hypertonia

- Asymmetric or symmetric bilateral involvement with at least grade 2 spasticity in lower limb/s and at least spasticity grade 1 in upper limb. Hypertonia on activity affecting trunk or legs ~~and making it impossible to ride a bicycle or tricycle;~~

Ataxia/Athetosis/Dystonia

- Severe athetosis/dystonia (E.g. large amplitude of excessive motion and long durations of excessive motions) in the lower limbs and trunk, ~~making it impossible to ride a bicycle or tricycle~~;
- A comparable mixture of ataxia/athetosis/dystonia and hypertonia/spasticity with a sport specific activity limitation equivalent to sport class H3~~, making it impossible to ride a bicycle or tricycle.~~

(text modified on 01.02.10; 01.02.11; 01.02.14; 01.05.16; 01.02.18; 01.01.21; 01.01.26)

16.5.005.4 Sport Class: H4

Eligible Impairment(s) which prevent an Athlete from using a ~~bicycle, tricycle or~~ kneeling/sitting position on a hand-cycle due to underlying health conditions.

Impaired Muscle Power

- Paraplegic with impairments corresponding to a complete lesion from ~~Th11~~ L2 or below;
- ~~No lower limb function/~~Impaired lower limb function;
- Non-spinal cord injury/incomplete spinal cord injury with a sport specific activity limitation, equivalent to sport class H4;

Impaired Passive Range of Movement

- Athletes with Impaired Passive Range of Movement with a lower limb sport specific activity limitation profile equivalent to sport class H4.

Limb Deficiency

- Athletes with lower limb deficiencies that meet the criteria for H5 but have additional impairment/s which prevent the ~~safe~~ use of ~~a conventional bicycle or~~ the kneeling/sitting position on a handcycle.

Hypertonia

- Asymmetric or symmetrical bilateral involvement with grade 2 spasticity in the lower limbs and grade 0-1 spasticity in the upper limbs;
- Unilateral involvement; at least grade 2 spasticity in the lower limb and grade 0-1 spasticity in the upper limb;
- ~~Hypertonia on activity making it impossible to use legs on a tricycle or bicycle.~~

Ataxia/Athetosis/Dystonia

- Severe athetosis/dystonia (E.g. large amplitude of excessive motion and long durations of excessive motions) in the lower limbs~~, making it impossible to ride a bicycle or tricycle;~~
- A comparable mixture of ataxia/athetosis/dystonia and hypertonia/spasticity with a sport specific activity limitation equivalent to sport class H4,~~ making it impossible to ride a bicycle or tricycle.~~

(text modified on 01.02.10; 01.02.11; 01.02.14; 01.02.18; 01.01.21; 01.01.26)

16.5.005.5 Sport Class: H5

~~Eligible impairment(s) which prevent an Athlete from using a bicycle or tricycle and~~ Athletes who can use the kneeling/sitting position must use this position.

Impaired Muscle Power

- Paraplegic with impairments corresponding to a complete lesion from Th11 or below;
- Normal abdominal strength, and normal trunk extension strength (e.g. normal trunk control);

Limb Deficiency

- Athletes who meet the Minimum Impairment Criteria for lower limb deficiency. ~~who have additional impairment/s which prevent the safe use of a conventional bicycle.~~

Hypertonia

- Asymmetric or symmetrical bilateral involvement, lower limbs affected and upper limbs normal or near normal;
- Unilateral moderate/severe involvement; at least grade 2 spasticity in the lower limb and grade 0-1 spasticity in the upper limb;
- Mild/normal trunk involvement;
- Hypertonia on activity ~~making it impossible to ride a bicycle or tricycle;~~

Ataxia/Athetosis/Dystonia

- Asymmetric or symmetrical bilateral involvement, mild – moderate;
- Unilateral Involvement, mild – moderate;
- Mild/normal trunk involvement;

Background

The main characteristic that currently divides H3 and H4 is trunk strength. H5 differs from H4 on the ability to compete in an arm-trunk powered handcycle. While handcycling and bicycling remain as one sport in Para-cycling, the two constitute different disciplines, and therefore it should remain an Athlete's choice whether to compete on a standard bicycle or in a handcycle, if they meet the impairment criteria for both.

The Vrije Universiteit (VU) Amsterdam conducted a research project from 2018-2022 on the Classification system in hand-cycling. As part of the research project, the team investigated the impact of lower-limb function on upper-limb pull and push strength in elite handcycling Athletes.

The aim of the study was to investigate the impact of closed-chain (CC) and open-chain (OC) conditions on the peak upper-limb force produced by elite hand-cyclists with different levels of lower-limb function, during standardized pull and push isometric strength tests.

Sixty-two international hand-cycling Athletes were recruited at two events in 2019 and data was collected in a controlled field-lab setting at the events. Participants were grouped based on the lower-limbs MMT scores. The group Lower-Limb Function (LLF) included Athletes with partial to normal lower-limb strength in at least one of the limbs (MMT scores 4-5 presented at hip flexion, hip extension, and knee extension). This mainly translates to Athletes with amputations, neurological impairments or incomplete spinal cord injuries. Athletes with mixed MMT scores were also included in the group LLF if they were able to perform normally (MMT score 4-5) on the most distal segment which pushes against the hand bike.
The group No Lower-Limb Function (NO-LLF) included Athletes who presented no or highly impaired strength in at least one muscle action in both legs (MMT scores 0-3 for hip flexion, hip extension and/or knee extension). Athletes with normal muscle function in the hip but no muscle function below would also be included in the group NO-LLF. This mainly translates to Athletes with complete spinal cord injuries at L1 or above.

In summary, a score of MMT 4-5 in at least one leg was considered as the ability to create a closed-chain function, MMT score below 4 in both legs was considered as not able to create a closed-chain. With highly mixed combinations, the function on the most distal segment (performing the closed chain) dictated which group the Athlete was assigned.

The significant advantage of using a closed chain (through connection of lower limbs with the hand bike) was observed in Athletes with partial to good lower-limb function, but not in those without. As such, these findings are particularly important for the Athletes allocated to the handcycling sport class H4, where Athletes with the least impairments can exploit the advantage provided by pushing off against the hand bike, but Athletes with no lower-limb function do not seem to benefit in an equal manner. The ability to perform a closed chain is not considered in the current handcycling Classification system nor in the handcycling technology paragraph of the UCI. To guarantee fair competition, the current Classification system should, therefore, consider the implication of these results on the Classification rules.

The proposed regulation changes in terms of trunk function are minimal (from Th11 to L1), however the research makes it clear that Athletes with lower limb function should be separated from Athletes without lower limb function, which is currently not the case. The research so far confirms that Athletes with different levels of trunk function can compete in the same class, as is currently the case.

Whilst UCI continues to research the impact of lower limb function in the H5 division, following discussions over past seasons with numerous stakeholders, including the Para-cycling Commission, the decision was made that, in line with Article 16.4.017 Multiple Sport Classes of the Para-cycling regulations, Athletes may make the choice between hand-cycling and bicycling, as these are considered to be different disciplines.

References:

The Impact of Lower-Limb Function on Upper-Limb Pull and Push Strength in Elite Handcycling Athletes. Muchaxo R, Kouwijzer I, van der Woude LHV, Janssen TWJ, Nooijen C, de Groot S. Sports Biomech. 2023 Aug 17: 1-15.

A Role for Trunk Function in Elite Recumbent Handcycling Performance?
Muchaxo R, Groot S De, Kouwijzer I, Woude L Van Der, Janssen T, Nooijen CFJ, et al. J Sports Sci. 2021 Oct; 39 (20): 2312-2321.

Impact on Athletes

This rule change means reviewing all Athletes currently classified in Sport Classes H3 and H4. Athletes identified with a potential class change will be place on Fixed Review Date 2026 and reclassified at the first Classification opportunity in 2026.

All Athletes in H3 and H4 will be requested to provide an up-to-date MDF on PCSAS. UCI will communicate with NFs should further medical information (e.g. MRIs, reports) be required.
The medical documents will be reviewed in the first half of 2025, with Athletes who may be affected by the rule changed identified. The NF/NPCs will be notified of Athletes who may fall into another Sport Class. These Athletes will be placed on FRD26 and will be reviewed at the first possible opportunity in 2026.

Implementation Timeline and transition period

September 2024	Rule change communicated with Para-cycling stakeholders, including rationale and timeline for implementation. Nations given the opportunity to feed back on the regulation changes.
January 2025	Request updated MDF and supporting medical documentation for all Athletes in H3 and H4.
January – July 2025	Review of medical information for Athletes in classes H3 and H4
August – December 2025	NFs/NPCs notified of Athletes possibly affected by rule change
December 2025	Athletes identified during review allocated Review Status
January 2026	Rule changes come into force, identified Athletes to be classified at their first event following the rule change.