2.5 Movement Analysis: Agonist and Antagonist Muscle Roles: 10-minute Pack

AQA 8582 · Calculators not allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Discuss the agonist and antagonist muscles responsible for Amara's hip, knee and ankle actions during take-off, and evaluate why the antagonistic pairing at each of these joints is essential for her jump to be both powerful and controlled.

(Total for Question 1 is 9 marks)

2 A rugby player pulls an opponent's arm downward and inward during a tackle, adducting their own shoulder. Identify the agonist and antagonist for this shoulder adduction.

(Total for Question 2 is 2 marks)

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Mark scheme · 2.5 Movement Analysis: Agonist and Antagonist Muscle Roles: 10-minute Pack

Question 1

Level 3 A detailed and coherent response that accurately names the agonist and antagonist muscles at Amara's hip, knee and ankle, explains their roles during take-off, and gives a well-justified evaluation of why antagonistic pairing is essential for both power and control. Sustained, accurate use of muscle and joint-action terminology throughout.	**7-9**
Level 2 Some accurate naming of agonist/antagonist muscles at two or more of Amara's joints, with some explanation of their roles, but coverage may be incomplete or the evaluative point about power and control underdeveloped.	**4-6**
Level 1 Basic or generic statements about muscles with little or no application to Amara's specific take-off action, and little or no evaluation.	**1-3**
Level 0 No relevant content.	**0**

Indicative content:

- Hip: gluteus maximus is the agonist for hip extension, contracting to drive the thigh back and down; the hip flexors (iliopsoas) act as the antagonist, relaxing and lengthening to allow this.
- Knee: quadriceps is the agonist for knee extension, straightening the leg explosively; the hamstrings act as the antagonist, relaxing and lengthening to allow this.
- Ankle: gastrocnemius is the agonist for plantarflexion, driving the foot down and off the ground; tibialis anterior acts as the antagonist, relaxing and lengthening to allow this.
- Power point: at each joint the agonist must fully contract, quickly and forcefully, to generate the drive needed to project the body upward, so the antagonist must relax fully and promptly rather than resisting the movement.
- Control point: if the antagonist did not relax appropriately, it would resist the agonist's contraction, reducing the force and speed of the movement and potentially straining the joint.
- Evaluative point: the coordinated relaxation of three separate antagonist muscles (hip flexors, hamstrings, tibialis anterior), timed correctly with the contraction of their agonists, is what allows all three joints to extend together smoothly rather than fighting against each other.
- Evaluative point: without correct antagonistic pairing at even one of these joints, the whole kinetic chain of the jump would be less powerful and less coordinated, showing that all three joints depend on the same underlying muscular principle.
- Balanced conclusion: antagonistic muscle action is not just about producing movement, but about producing it powerfully, in the correct sequence, and without the joint being damaged by opposing muscular resistance.

Question 2

agonist: latissimus dorsi	**B1**
antagonist: deltoid	**B1**

Answer: Agonist: latissimus dorsi. Antagonist: deltoid.

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