

Supplementary Table 1: Search criteria used for the systematic review according to the PICO definition

	Embase	PubMed	Web of Science
Key terms	P	Professional sports-persons (football, rugby, boxing, wrestling, hockey), at least one season of competitive play	
	I	Concussion (transient loss of normal brain functioning following a blow to the head) sustained during sporting participation, at least one documented	
	C	Lay population or other suitable comparison groups (i.e. non-concussed athletes in case-control studies)	
	O	Diagnosis of Alzheimer's dementia or mild cognitive impairment, assessed through formal clinical diagnosis, cognitive testing or neuroimaging showing structural brain changes	
Database search	('athlete' OR 'sport' OR 'football' OR 'rugby' OR 'boxing' OR 'wrestling' OR 'hockey')	("sports" OR "sport" OR ("athletes" OR "athletes") OR ("football") OR ("rugby") OR ("boxing") OR ("wrestling") OR ("hockey"))	(athlete OR sport OR football OR rugby OR boxing OR wrestling OR hockey)
	('concussion' OR 'head injury' OR 'brain injury')	("brain concussion" OR "concussion" OR "traumatic brain injuries")	(concussion OR brain injury OR head injury)
	('dementia' OR 'Alzheimer disease' OR 'mild cognitive impairment' OR 'neurocognitive test' OR 'cognitive test' OR 'magnetic resonance imaging')	("alzheimer disease" OR "dementia" OR cognitive dysfunction" OR "mild cognitive impairment" OR "neurocognitive test" OR "cognitive test" OR "MRI")	(dementia OR Alzheimer's disease OR mild cognitive impairment OR neurocognitive test OR cognitive test OR magnetic resonance imaging)
Full search	'sport'/exp OR 'sport' OR 'athlete'/exp OR 'athlete' OR 'football'/exp OR 'football' OR 'rugby'/exp OR 'rugby' OR 'boxing'/exp OR 'boxing' OR 'wrestling'/exp OR 'wrestling' OR 'hockey'/exp OR 'hockey' AND ('concussion'/exp OR 'concussion' OR 'brain injury'/exp OR 'brain injury' OR 'traumatic brain injury'/exp OR 'traumatic brain injury' OR 'head injury'/exp OR 'head injury') AND ('alzheimer disease'/exp OR 'alzheimer disease' OR 'dementia'/exp OR 'dementia' OR 'mild cognitive impairment'/exp OR 'mild cognitive impairment' OR (neurocognitive AND ('test'/exp OR test)) OR 'cognitive test'/exp OR 'cognitive test' OR 'nuclear magnetic resonance imaging'/exp OR 'nuclear magnetic resonance imaging')	(((((("sports--[MeSH Terms] OR "sports"[All Fields] OR "sport"[All Fields]) OR ("athletes"[MeSH Terms] OR "athletes"[All Fields] OR "athlete"[All Fields])) OR ("football"[MeSH Terms] OR "football"[All Fields]) OR ("rugby"[MeSH Terms] OR "rugby"[All Fields] OR "boxing"[MeSH Terms] OR "boxing"[All Fields]) OR ("wrestling"[MeSH Terms] OR "wrestling"[All Fields]) OR ("hockey"[MeSH Terms] OR "hockey"[All Fields])) AND ((("brain concussion"[MeSH Terms] OR "brain"[All Fields] AND "concussion"[All Fields]) OR "brain concussion"[All Fields] OR "concussion"[All Fields]) OR ("brain injuries, traumatic"[MeSH Terms] OR ("brain"[All Fields] AND "injuries"[All Fields] AND "traumatic"[All Fields]) OR "traumatic brain injuries"[All Fields] OR ("traumatic"[All Fields] AND "brain"[All Fields] AND "injury"[All Fields]) OR "traumatic brain injury"[All Fields])))) AND (((("alzheimer disease"[MeSH Terms] OR "alzheimer"[All Fields] AND "disease"[All Fields]) OR "alzheimer disease"[All Fields] OR ("alzheimer's"[All Fields] AND "disease"[All Fields]) OR "alzheimer's disease"[All Fields] OR ("dementia"[MeSH Terms] OR "dementia"[All Fields]) OR ("cognitive dysfunction"[MeSH Terms] OR	(athlete OR sport OR football OR rugby OR boxing OR wrestling OR hockey) AND (concussion OR brain injury OR head injury) AND (dementia OR Alzheimer's disease OR mild cognitive impairment OR neurocognitive test OR cognitive test OR magnetic resonance imaging)

		("cognitive"[All Fields] AND "dysfunction"[All Fields]) OR "cognitive dysfunction"[All Fields] OR ("mild"[All Fields] AND "cognitive"[All Fields] AND "impairment"[All Fields]) OR "mild cognitive impairment"[All Fields]) OR (((neurocognitive[All Fields] AND tests[All Fields]) OR "cognitive"[All Fields] AND "test"[All Fields]) OR ("magnetic resonance imaging"[MeSH Terms] OR ("magnetic"[All Fields] AND "resonance"[All Fields] AND "imaging"[All Fields]) OR "mri"[All Fields]))	
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