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Executive Summary:

The South African Rugby Union (SARU) implemented regulations preventing underage male and female rugby players from playing in senior games. The SARU regulations are aligned to the regulations of World Rugby and have been formulated to protect the players who may be vulnerable to serious injury because of a mismatch in size and physical development. The regulations were implemented in 2010, with slight modifications in 2011. These regulations are applicable to both male and female rugby players. No player in this vulnerable group at this level has had a catastrophic injury since the regulations were implemented. After a review of the imposed normative data, the age-based risk analysis for adult rugby report (ABRAAR) resulted in an update of the physical requirements for male underage players in 2019.

These recent updates do however not include the physical testing requirements for an underage female wanting to play senior rugby. Since there is limited normative data available in women's rugby in South Africa, this report therefore follows an evidence-based approach to best guide the minimum physical requirements for underage females wishing to participate in adult women's rugby.

This document will firstly highlight the known body masses and heights of Senior South African female rugby players. These data are important in establishing the minimum physical requirements and standards that follow.

Physical Characteristics of national senior South African Women's Rugby players:

The South African Rugby Union (SARU) have body mass and height data on 148 national team female rugby players, who have represented the South African senior team between 2017-2021. These data are summarised in Table 1 below.

Table 1: The average mass and height of South African national team Women's Rugby players within the different positional categories.

	Mean Body Mass (kg)	Mean Height (cm)
Front Row	85.8 (n=34)	167.9 (n=16)
Locks	78.2 (n=20)	175.8 (n=6)
Loose Forwards	74.6 (n=19)	166.6 (n=7)
Inside Backs	68.0 (n=22)	163.3 (n=8)
Outside Backs	63.3 (n=46)	166.2 (n=19)

The data is presented as weight or height with the number of players included in parentheses. Front row = Props and Hookers; Loose Forwards = Flanks and Eighthman; Inside Backs = Flyhalf and Centres; Outside backs = Scrumhalf, Wings and Fullback.

Minimal Requirements for Muscle Strength:

Muscle strength has previously been assessed by a maximal bench press. Normative muscle strength data is classically reported as a relative value: i.e., maximum weight lifted in kilograms (1RM)/body mass. When evaluating this measurement, the American College of Sports Medicine published normative data for relative bench press; the normative data for men are approximately 1.6 times greater than for women[1].

The table below shows the male relative bench press requirements (based on the normative weight and strength data shown HERE) e.g., 1.24 times Body Mass, the equivalent relative female value adjusted according to the American College of Sports Medicine guidelines e.g., 0.78 x Body Mass, followed by the absolute bench press target in kilograms e.g., 67 kg, which would be required to be allowed to play Women's Rugby in South Africa at the senior level.

Table 2: The calculation of the proposed minimum strength requirements for South African Women's Rugby players

	Male **Relative 1RM Bench Press Minimum requirements**	***Female*** **Relative 1RM Bench Press Minimum requirements (Men /1.6)**	**Proposed Minimum Absolute Bench Press Requirement (*Females*)**
Front Row	1.24	0.78	67 kg (*65 kg)
Locks	1.08	0.66	51 kg (*50 kg)
Loose Forwards	1.21	0.76	56 kg (*55 kg)
Inside Backs	1.29	0.81	55 kg
Outside Backs	1.25	0.78	50 kg

*Front row = Props and Hookers; Loose Forwards = Flanks and Eighthman; Inside Backs = Flyhalf and Centres; Outside backs = Scrumhalf, Wings and Fullback. * Values are rounded down to the nearest 5kg weight.*

Minimal Requirements for Muscle Endurance:

Muscle endurance has previously been assessed by the maximum number of push ups performed in a minute. The ACSM reports normative data for *female* push-ups. These push ups are *performed with the knees on the ground (knee push ups)*, as opposed to the standard straight leg push ups utilised for males. When evaluating the ACSM published normative data for push ups, the normative data for women (knee push ups) are 0.8 times that of men (standard push ups)[1]. The data for South African Women's rugby players have therefore been adjusted accordingly to match the standards set for their male counterparts, as per the table below.

Table 3: The calculation of the proposed minimum requirements for muscle endurance for South African Women's Rugby players

	***Male* Push Ups (*straight leg push-ups*) Minimum requirement**	**Proposed minimum requirement for *Female* push ups (*push ups on knees*) (*Male* push ups x 0.8)**
Front Row	49	39
Locks	40	32
Loose Forwards	45	36
Inside Backs	51	41
Outside Backs	46	37

Front row = Props and Hookers; Loose Forwards = Flanks and Eighthman; Inside Backs = Flyhalf and Centres; Outside backs = Scrumhalf, Wings and Fullback.

Minimal Requirements for Cardiovascular Fitness:

Cardiovascular fitness has previously been assessed with the Bleep Test. The Bleep Test estimates your maximal oxygen uptake, or VO_2 max, which is considered to be the best indicator of cardiovascular fitness. The ACSM normative data is able to provide a percentile score for the estimated VO_2 max value achieved. The table below shows what percentile the target estimated VO_2 max value represented for males, and using the ACSM data, provides the corresponding percentile equivalent VO_2 max value and associated number of shuttles required, for South African Women's Rugby players to achieve in the Bleep Test.

Table 4: The calculation of the proposed minimum requirements for cardiovascular fitness for South African Women's Rugby players

	***Male* Minimum Bleep Test scores** (Shuttles: VO_2 max: Percentile)	***Female* equivalent VO_2 max**	**Proposed minimum requirement for Bleep Test Scores (*Females*)**
Front Row	73 = 44,2 ml/kg/min = 43rd percentile	36 ml/kg/min	50 shuttles
Locks	85 = 48,0 ml/kg/min = 57th percentile	39 ml/kg/min	58 shuttles
Loose Forwards	87 = 48,7 ml/kg/min = 61st percentile	41 ml/kg/min	64 shuttles
Inside Backs	99 = 52,2 ml/kg/min = 71st percentile	43 ml/kg/min	70 shuttles
Outside Backs	94 = 50,8 ml/kg/min = 68th percentile	42 ml/kg/min	67 shuttles

Front row = Props and Hookers; Loose Forwards = Flanks and Eighthman; Inside Backs = Flyhalf and Centres; Outside backs = Scrumhalf, Wings and Fullback.

SUMMARY

The table below summarises the minimum requirements for underage females to be allowed to play senior level women's rugby in South Africa.

Table 5: The summarised minimum requirement physical assessment targets for South African Women's Rugby players

MINIMUM REQUIREMENTS FOR SOUTH AFRICAN *WOMEN'S RUGBY* PLAYERS			
	BENCH PRESS (kg)	**KNEE PUSH UPS**	**BLEEP TEST (shuttles)**
Front Row	65	39	50
Locks	50	32	58
Loose Forwards	55	36	64
Inside Backs	55	41	70
Outside Backs	50	37	67

Front row = Props and Hookers; Loose Forwards = Flanks and Eighthman; Inside Backs = Flyhalf and Centres; Outside backs = Scrumhalf, Wings and Fullback.

REFERENCES

1. American College of Sports Medicine. ACSM's Guidelines for Exercise Testing and Prescription. Tenth edition. Philadelphia: Wolters Kluwer, 2018.