ASPIRE PLAYER PERFORMANCE DEVELOPMENT

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CONTEXT

The State of Qatar counts 17 football clubs, and approximately 6500 players registered across youth to senior categories. The process of talent identification is of particular importance within the long-term development of our student-athletes. In this context, Aspire Academy conduct countrywide scouting of players since early developmental phases (U6-U8) and inform decisions for selection across different talent centers. Outcomes from this initial screening determine eligible athletes to progress through enrollment in the Feeders generation (U9-U12). Based on meeting specific criteria set by Football and Performance Departments at Aspire Academy, the selected athletes then enter into the full-time academic and sports curriculum as part of the U13 to U18 Elite programme.

The mission of Aspire Academy is to develop well-educated champions in sports and life, with the ultimate goal of competing internationally with the Qatar National Team. Some players attend the part-time curriculum (afternoon training sessions only), whereas the majority of Aspire Academy players progress through the full-time programme which encompasses both football and academic education. In parallel with attendance to school classes, players undertake double training sessions three times per week (Sunday, Monday, Wednesday) and a single training session only scheduled on Tuesday and Thursday. During weekends, players typically return to their respective clubs for official National League matches (Figure 1).

Technical, medical, and performance departments recruit experts from around the world. Support staff in each generation involves the following figures: 2 football coaches, 1 goalkeeper coach, 1 strength and conditioning coach, 1 performance scientist, 1 physiotherapist, and 1 performance analyst. With the challenge of pursuing a common and integrated approach, we usually conduct regular meetings at different corporate levels (staff meeting, unit meeting, department meeting). In addition to this, experts in biomechanics, neurophysiology and performance nutrition provide complementary support to our service provision processes across all the generations.

STRATEGIC APPROACH

Regarding the strategical approach of our methodology, we consider 4 aspects:

1. Game perspective

We integrate the game demands and the football methodology to design bespoke development plans for each individual player.

2. Player-centric approach:

To design the individual plan, we consider all the player psychophysiological spheres. This includes his psychological skills, game understanding, tactical, technical, and physical performance attributes. Likewise, this also includes paying attention to other important yet invisible elements such as social and educational backgrounds, sleeping routine, and nutritional habits (Figure 2). Aspire Academy students' athletes are not only football players, each one of them is a unique person.

	Sunday	Monday	Tuesday	Wednesday	Thursday
7.25	School			School	
8.10	Breakfast				
8.35 - 10.15	School				
10.30 - 12.00	Training	Training	School	Training	Educational session
12.00	Lunch				
13.00 - 15.00	School				
16.00 - 18.00	Training	Training	Training	Training	Club
18.30	Dinner				

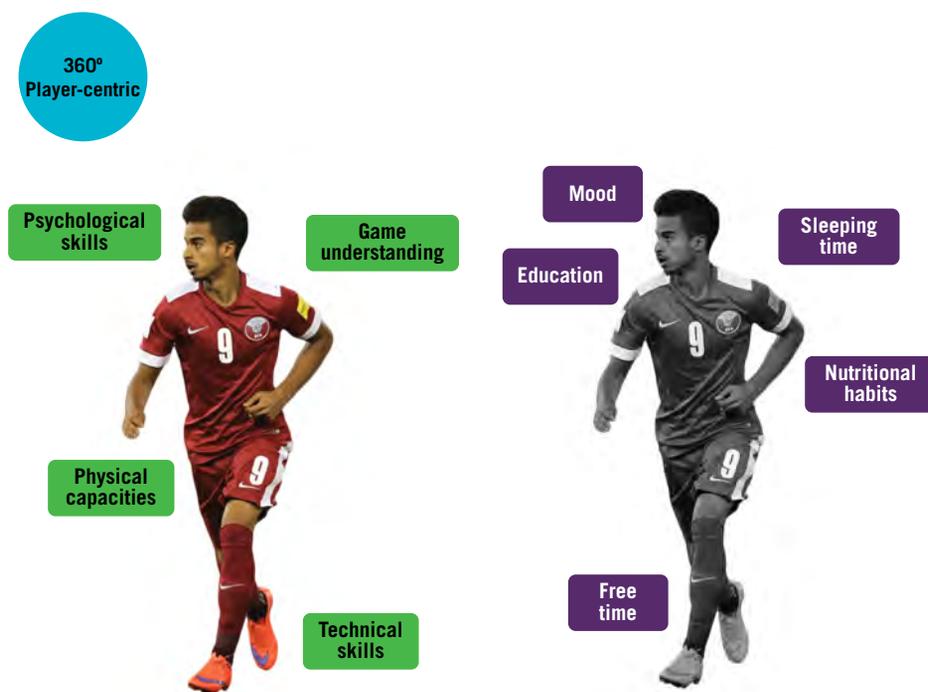**Figure 1:** Aspire Football player weekly schedule.
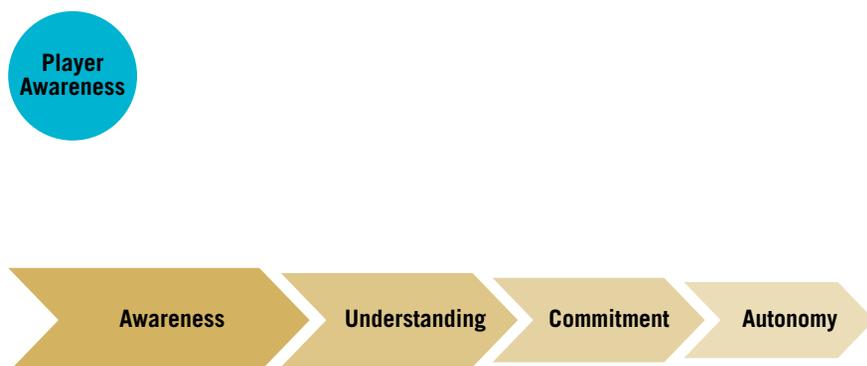

Figure 2: Player centric approach.

Figure 3: From awareness to autonomy.

3. Player awareness:

In Aspire Academy, we consider the educational aspect paramount. If we want players committed to their individual development process, we need to develop their awareness. If players are aware of their needs, they understand why we implement every single exercise, enhancing commitment to their programme. Finally, they will build sustainable habits and become more autonomous (Figure 3).

As part of our strategy to develop player awareness, we start every training session with a mentoring session which serves to develop the player' understanding of the drills and exercises, and player' understanding themselves inside the game. Additionally, we implement weekly educational sessions covering a range of topics pertinent to player development. Lastly, through individual meetings, we discuss their strengths and area of improvements. Interactions between coaches and players is the main channel to create player awareness.

4. Feedback training methodology:

We aim to develop player awareness through multiple channels. Players receive feedback from coaches but also from their teammates. We encourage players to correct their teammates in order to stimulate a deeper understanding of each skill. Additionally, each player can receive direct feedback, evaluating and correcting himself when needed with the support of technology (qualitative feedback from camera and screen, quantitative feedback through performance analysis),

ELITE PROGRAMME: LONG-TERM PHYSICAL DEVELOPMENT
Our long-term physical development programme (Figure 4) is underpinned by modern scientific practice, considers our context and is closely linked with the needs and demands of the football methodology.

The model starts with our **feeders programme** (U9-U12), which emphasizes basic motor skills through games and play and multi-sport activities like gymnastics and judo. The next step in the programme takes place when the players enter the academy and consists of three levels.

During their first two years, in **Level 1** (U13-14), the focus is on **skill acquisition**, which aims to develop movement literacy through micro-dosing key physical
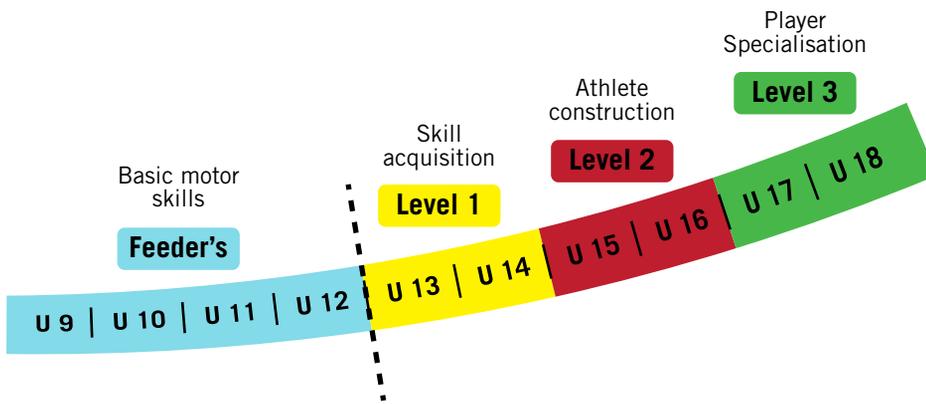
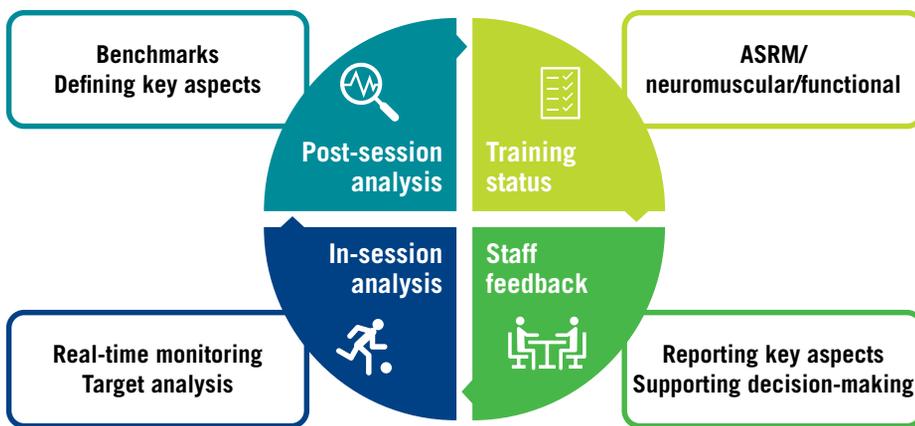**Figure 4:** Aspire Academy player development timeline.

Figure 5: Training load process.

components (coordination, speed & agility, strength, and endurance). We place a strong focus on cues and common language, giving frequent and consistent messages with ample opportunities to explore movement patterns. A key consideration in this level involves the use of multi-sports (handball, basketball) to develop coordination and more holistic movement strategies. Speed & agility development is technique focused with respect to acceleration, maximal speed and change of direction, while also micro-dosing peak-velocity exposure. Resistance training encompasses foundation movements, developing robust patterns in squat, hinge, push, pull and carrying exercises while beginning the process of load initiation. Endurance work prioritizes development of aerobic capacity through more continuous, medium intensity work. Outside these general themes, individual work with players looks to addresses running and change of direction technique.

Building on our foundational work, **Level 2** (U15-16) is focused upon **athlete**

construction, where we look to increase the training load of the players. All the key physical attributes from level 1 now have a heightened emphasis on intensity, including progression of load where appropriate in the gym, increased maximal velocity exposure in speed work and more intense intermittent intervals during endurance development. This is still underpinned by refining motor skills and encouraging good movement quality, through consistent cueing and common language. Our resistance training now involves more complex movements in addition to the introduction of eccentric focused work. However, this sensitive phase within youth development requires special attention around growth and maturity to safely navigate potential growth-related complaints that can appear around this time. Regarding the individual needs of the player, this requires load management on a case-by-case basis, particularly players considered pre- or circa- peak height velocity. It can involve strategies such as modifying lifts in the gym, managing

intensity of plyometric work, reducing cumulative sprint distance, while preserving sprint events. Maintenance of mobility and stability in this phase of development is a high priority during windows for individual needs, with players experiencing accelerated growth being susceptible to adolescent awkwardness.

In **Level 3** (U17-18) we look towards **player specialization**, loading the player according to their specific position, developing robustness to cope with football's high-performance demands. Building on our previous levels, we move into a phase of increased intensity, with endurance focusing on specific playing positions. Position specific co-ordination and speed & agility work contains elements of decision making alongside peak velocity exposure. Strength development also becomes more player specific, focusing on speed-power and eccentric work. In parallel with this individualized approach, there are still general themes of work that underpin the periodized approach throughout the season. Training load management takes on an important role at this stage with players involved with their clubs, U19 activities and potentially U23 and 1st team training and matches.

TRAINING LOAD ANALYSIS: WEEKLY AND DAILY TARGETS

The training load analysis might be divided in four different areas as described in Figure 5.

To provide insights on player readiness, an Athlete self-report measures (ASRM) is used daily before the first training session. The Aspire's ASRM is based on three questions:
- How Fatigued Do You Feel?
- How Sore (Muscle) Do You Feel?
- How Well Did You Sleep?

In addition, an objective assessment based on a countermovement-rebound jump assessment is used to monitor the neuromuscular capacity of the players at two days after the game (G+48h) with the oldest age-categories. This assessment provides objective data to support the decision-making process of the staff during the organization of the training session. All relevant information obtained through the ASRM, neuromuscular assessment and individual conversation with the players are shared between staff members during the daily staff meeting. Likewise,
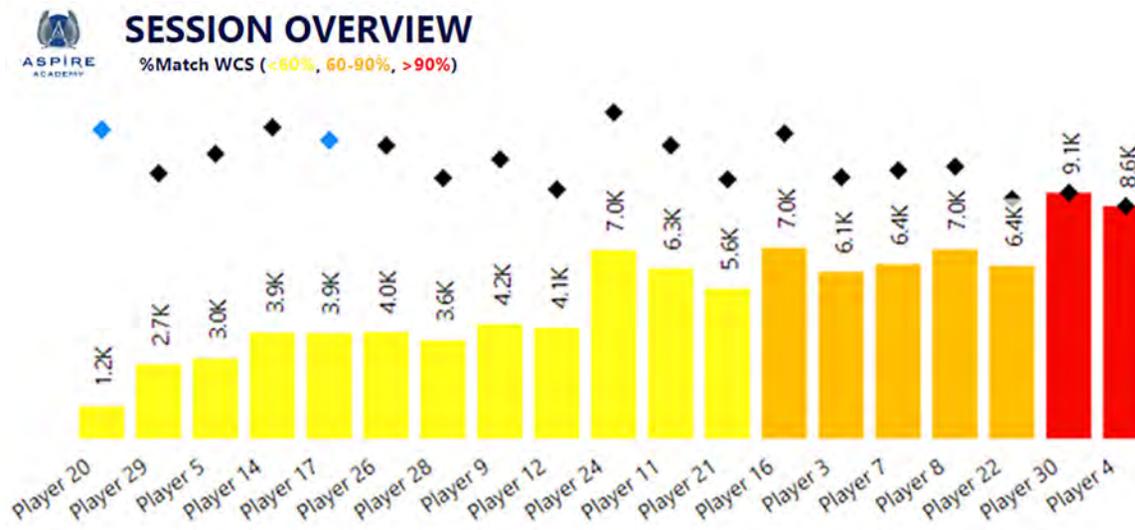
SESSION OVERVIEW
%Match WCS (≤60%, 60-90%, >90%)

Figure 6: Example of the external training load based on the worst-case scenario. Visual is sorted by ascending value and colors of the bars are related to the percentage of the load (low, moderate, and high). Black dots indicate the value of the Worst-Case Scenario considered.
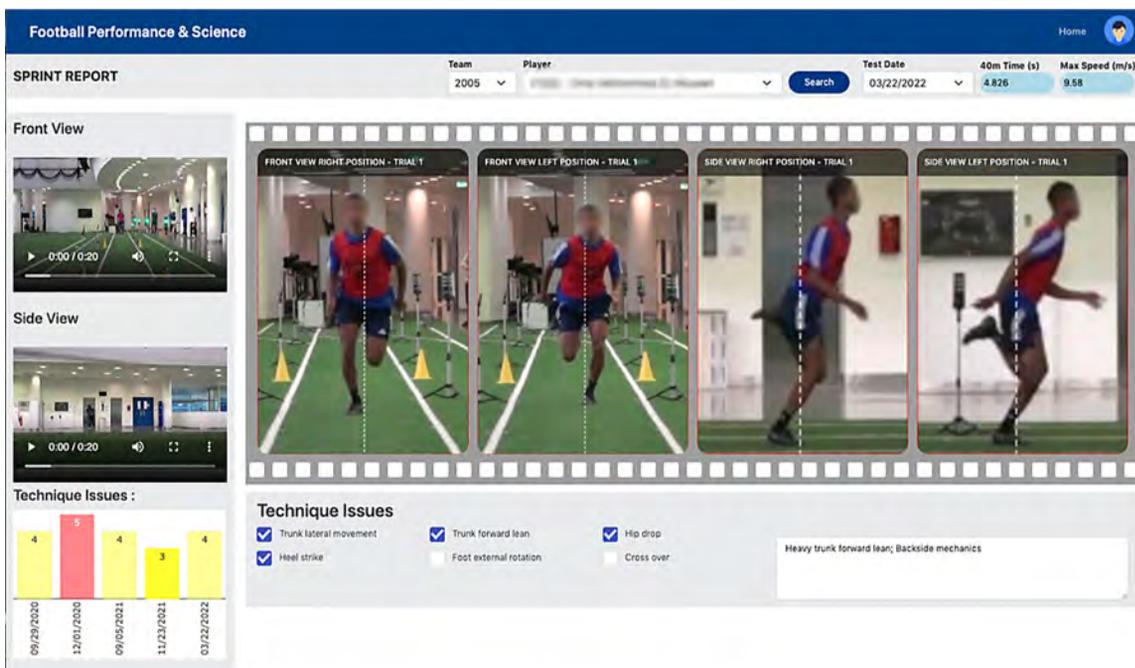
Figure 7: Example of qualitative running technique analysis. Similar analysis is also carried out for jump and change of direction tests. Coaches and players are provided with a report including basic performance data, video views, still images, identified technique issues as well as past assessment outcome using in-house build application. The application is used to analyze, share and store the technique assessment data. It also features options for comparison between two assessments as well as creating team overviews. Players have their mobile application to view their personal reports.

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the external and internal load data of the previous training sessions are shared. As consequence of the weekly plan explained in the 'Strategic approach' chapter, the information related with the club activity for each player are reported in the first meeting of the week (e.g., minutes played in the game, RPE, etc.).

The external load of the players is monitored during all the training, rehab, and matches through a Global Positioning System (GPS) with the performance scientist of each team assuming responsibility for post- and live session monitoring. The latter provides the coaching team with the required information to adapt a specific

exercise or session to add/reduce set or repetitions to ensure individual player targets are achieved.

The post-session analysis consists of defining the key aspects to be reported during the staff meeting. This analysis is underpinned by benchmarking the training load data against the following approaches:

- Match data: also named WCS (worst-case scenario), the % of the match achieved in a training session (Figure 6) is calculated and categorized into 3 bands such as 0-60% (low load - yellow), 60-90% (moderate load - amber) and +90% (high load - red). In the case of week analysis, the total weekly load is compared with

bands defined as 0-1x match (low load - yellow), 1-2x match (moderate load - amber) and +2x match (high load - red).

- Historical data: as an alternative, individual player data can be also used to benchmark a training session by ranking all historical data from each player/metric/day-type. Specifically, we adopt a distribution-based approach that involves the estimation of crude percentiles determining whether a given session load fell within the range of typical (green), relatively higher/ lower (amber) or much higher/lover (red) values for a specific metric given the training session. Likewise, we

Figure 8: Sprint test data acquisition. Force plates (installed under the turf, dotted area) and high-speed video cameras (yellow circles) are used to acquire detailed performance data during assessment and training. Our novel motion capture system allows marker-less motion analysis, i.e. no need to attach any markers or sensors onto the player.
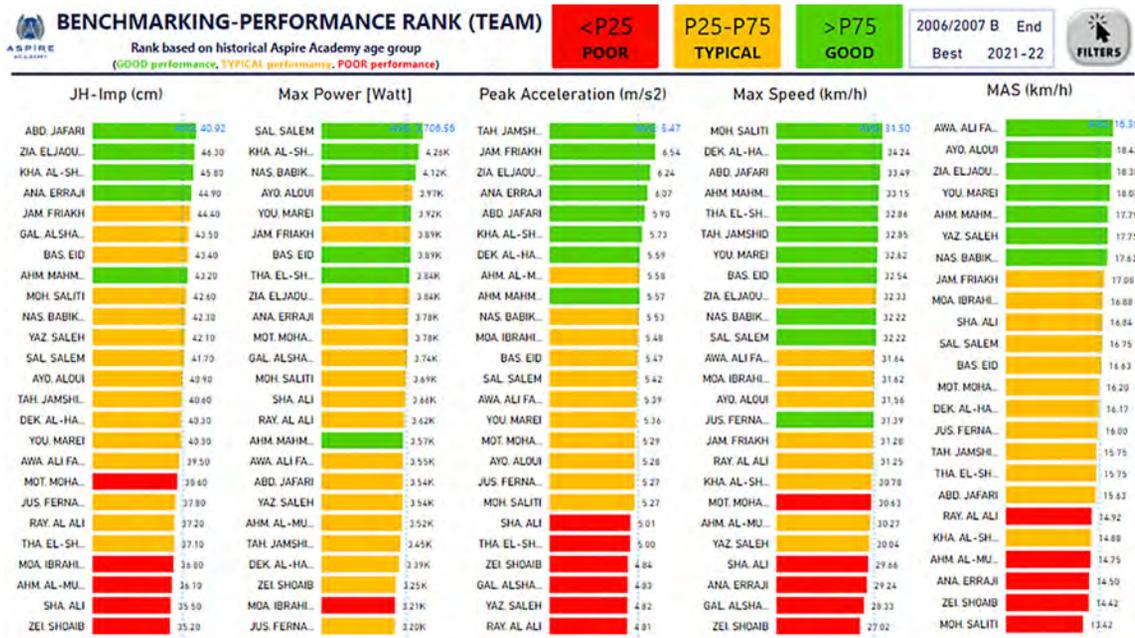

Figure 9: Example of assessment data visualization in PowerBI. Users have several different visuals to view player performance data with reference to their teammates, age-group or playing position, as well as for longitudinal performance (or growth/maturity) progression.

adopt this approach for the weekly analysis. Collectively, the approaches we discussed herein ultimately provide us with insights relevant to set the training/week target as an important aspect informing optimal player development strategies.

INDIVIDUAL DEVELOPMENT PLAN: EVERY PLAYER IS A PROJECT
Performance assessment to identify individual needs
All players undergo physical performance assessment for their sprint, jump and endurance abilities at the start, middle and end of each season. In addition, their movement competency is also evaluated using qualitative technique assessment (Figure 7, movement technique application).

State-of-the-art technology, including force plates and high-speed video cameras integrated into the training facilities (Figure 8, sprint station), is used to capture the performance details for building a physical profile of the players. All the performance data is stored in a central cloud database with various dashboards (PowerBI) available to coaches and staff to view the players' performance progression, benchmarking with their respective teams, playing position and/or age group (Figure 9).

Considerations about growth and maturation to support youth player development
Understanding of the population growth and maturation events timings is important for talent identification and development purposes within the long-term player development proves[1,2]. In practical terms, knowledge of the most plausible window we expect players to be passing the pubertal growth spurt will be essential to inform the selection of conditioning strategies given information obtained from ongoing tracking of growth and maturation measurements[1]. In our academy context, skeletal age and standing height represent
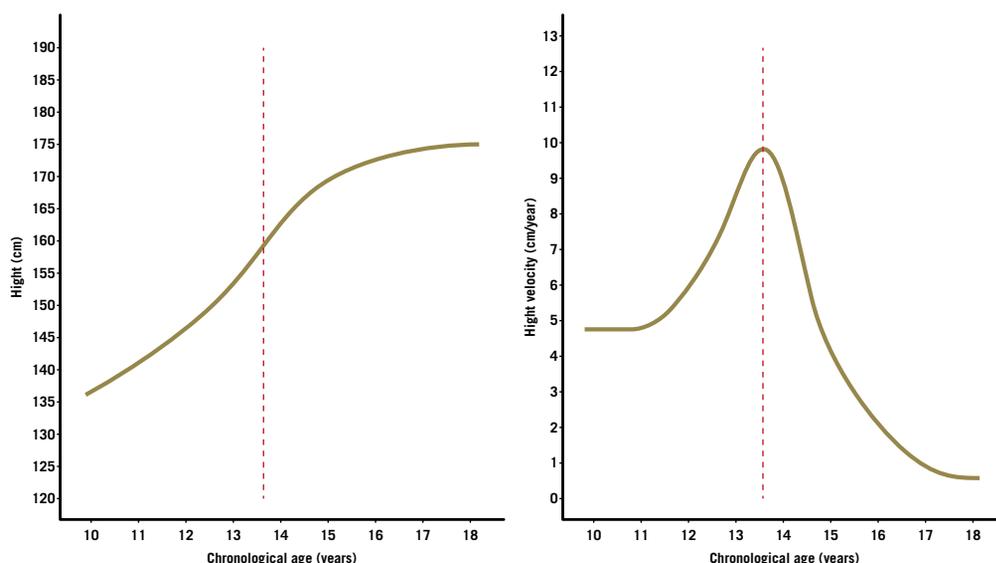
Figure 10: Population (n=125) mean height (a) and velocity curves (b). The vertical red dashed lines indicate the age at peak height velocity (13.62 years; 95% confidence interval: 13.55 to 13.70 years).

Figure 11: Biomechanics implementation. Additional biomechanical support is provided for selected players. These players will receive individual training support and enhanced feedback (e.g. video, performance) based on their training objectives.

proxy measures of biological maturation and growth. Skeletal age is assessed once a year, whereas body height is tracked monthly. Importantly, recent evidence from growth curve analysis (Figure 10) revealed elite youth Qatari soccer players typically pass through the pubertal growth spurt around 13.6 years with an average growth velocity of 9.9 cm·yr⁻¹ [3]. These findings allow us to superimpose individual information against population estimates for ongoing tracking of our student-athletes throughout their academy development. Additionally, we are using body height and percentage of predicted adult height to rate players as pre, circa or post-PHV.

Nutrition plays an important role in supporting the normal growth as well as optimizing the training response. Our nutritional strategies are integrated into the daily schedule of our student athletes focusing on two main aspects: preparing to train and compete and recovering between training sessions and games. Three daily meals and snacks are provided by Aspire Academy. Menus are designed based on latest food recommendations for youth elite athletes and adjusted based on daily training demands. Players' body composition is frequently assessed by body weight (weekly) and skinfolds measurement for monitoring nutrition intake. In case of any concerns regarding players' body composition and nutritional habits, they are referred to nutritionist for consultation and action plan accordingly.

Player development plan (PDP): staff integration and player engagement
Following performance assessments, team staff (coaching, performance and medical) for each age group meet to review the assessment data and build/update a 360° player profile. In this PDP meeting, players' individual physical (Coordination/Strength/Endurance/Speed & Agility), medical (injury history, joint mobility, muscle flexibility) and technical-tactical needs are defined and prioritized to optimize his development as a football player. Growth and maturity status is reflected in each individual plan. Training objectives and appropriate intervention plans are agreed with the team staff.

Training objectives are discussed with each player in order to ensure that the player is aware of his training needs and objectives and understands how they are linked to his football performance. Our approach is to educate and encourage the players to critically evaluate their own performance and psycho-social needs (i.e., what do I need to change or improve?)[4]. Player's training status and progression is continuously

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reviewed during daily staff meetings and the training plan is adjusted accordingly. Training objectives and individual needs are also discussed with the players before each training session. During pre-session discussions, daily training objectives are reviewed, and players are stimulated to express their own needs and difficulties as well as to find solutions to them.

Based on the agreed intervention plans, the targeted players receive additional individual support by specialist staff around the teams (e.g. psychologist, nutritionist, biomechanist). For psychological and/or nutritional needs the players have regular consultations/ follow-up with psychologist/ nutritionist. In order to address the player's individual needs in physical performance or movement competency, biomechanist is providing additional training support focused on those specific needs. Accordingly, player receives customized training with enhanced performance and technique feedback / monitoring integrated in their regular training plan (Figure 11, pictures of biomechanics implementation). This type of training support can be more effective in improving performance and also to reduce the risk of injuries, as compared to conventional team training[5].

The PDP process is an essential component of our methodology. It allows an integrated approach through all specialized staff and the player himself. Then an individual program including all the specific player needs and areas of improvement is implemented into his weekly training schedule. The ultimate objective of this process is to allow each player to reach is optimal performance.

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