

Performance Progression for a Competitive Athlete with Achondroplasia: A Case Study

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BACKGROUND/PURPOSE

The performance progression and testing battery improvements for able-bodied athletes using an undulating periodization scheme has been well studied (Haff & Triplett, 2016; Painter et al., 2012). However, there is little information on the effect of an undulating periodization scheme on an F40 (short stature) para athlete utilizing an undulating periodization scheme in the context of preparing for competition.

The primary purpose was to investigate the utilization of current coaching and strength training methodologies among para athletes, including the use of undulating periodization. This was accomplished by demonstrating the effectiveness of sports specific testing and implementation of an undulating periodization scheme with the goal of increased performance within the F40 classification events of shot put and javelin.

METHODS

The para athlete was a 19 year old male with achondroplasia and was classified as an F40 competitor according to International Paralympic Committee classification standards. The athlete was introduced to paralympic sport in the fall of 2017 and began training for the 2018 season. Anthropometric data and physical testing battery was performed prior to training for competition in the 2018 season. A retrospective analysis of the testing battery improvement and performance improvement was completed following the 2019 season. Along with an example of the annual plan utilizing an undulating periodization model (Haff & Triplett, 2016). An undulating periodization model was chosen for this athlete despite evidence of more efficient strength gains with block periodization (Painter et al., 2012). This was because of emphasis that had to be placed on technical training due to lack of sport specific experience with this athlete, along with weekly scheduling considerations.

RESULTS

Table 1 demonstrates anthropometric changes. Table 2 demonstrates performance outcome improvements between 2018 and 2019 seasons. Performance was compared to the number 1 and number 3 distances (United States Paralympic A standards) of that year for the F40 classification for shot put and javelin. Figure 1 and Figure 2 demonstrates improvement in physical battery and testing during the 2017-2018 annual plan utilizing an undulating periodization schema, as shown for example in Figure 3.

TABLES/FIGURES

Table 1

Date	10/17/17	4/6/18
Anthropometric		
Gender	Male	
Age	19	20
Height (m)	1.29	1.29
Weight (kg)	47.99	49
Chest (cm)	84	86
Waist (cm)	74	74
Hip (cm)	92	96

Table 2

2018 Season	Shot	Javelin	% Shot	% Jav
World Ranking	15	29		
World #1	10.88	43.26	0.73	0.54
World #3	9.91	39.2	0.80	0.60
Seasons Best	7.94	23.57		
Personal Record	7.94	23.57		

2019 Season	Shot	Javelin	% Shot	% Jav
World Ranking	12	23		
World #1	10.38	43.61	0.79	0.58
World #3	10.04	39.01	0.82	0.64
Seasons Best	8.19	25.08		
Personal Record	8.19	25.08		

Figure 1

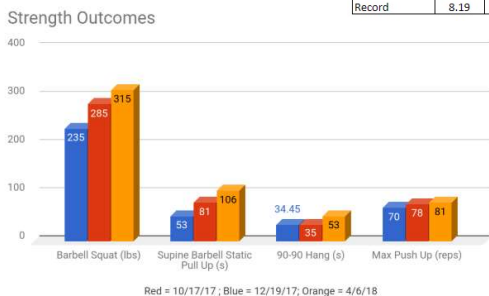


Figure 2

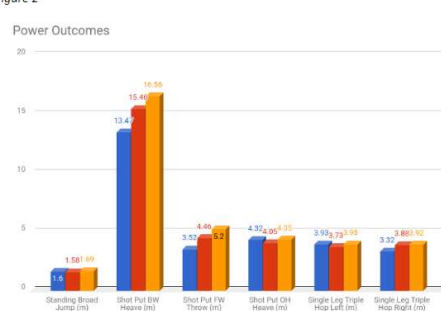
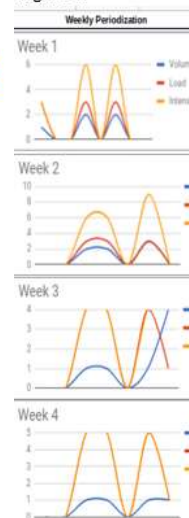


Figure 3



DISCUSSION/CONCLUSIONS

The undulating periodization model demonstrated improvements in strength and power outcomes during the 2017-2018 season. The same trend appears to be ongoing in the 2018-2019 season. The use of the testing battery tracking along with periodization scheme seems to have the potential to optimize strength and performance improvements in F40 para athletes preparing for competition. This also represents preliminary evidence that this method may allow coaches to safely implement loading throughout the year using traditional performance schema for this population. Future research should investigate these methodologies with a larger sample, perhaps with a control group, and with other para athlete classifications.

References

- Haff, G., Triplett, T. (2016) Essentials of strength and conditioning: fourth edition. *Human Kinetics, Champaign, IL.*
- Painter, K.B., Haff, G., Ramsey, M.W., McBride, J., Triplett, T., Sands, W.A., Lamont, H.S., Stone, M.E. & Stone, M.H. (2012) Strength gains: Block versus daily undulating periodization weight training among track and field athletes. *International Journal of Sports Physiology and Performance*, 7; 161-169



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