



BASBALL

VELOCITY-BASED TRAINING FOR BASE STEALING

SPEED, EXPLOSIVENESS & DATA-DRIVEN DEVELOPMENT



WHAT IS VELOCITY-BASED TRAINING (VBT)?

- **TRADITIONALLY USED IN STRENGTH & CONDITIONING.**
- **MEASURES BAR SPEED OR MOVEMENT VELOCITY.**
- **APPLIED HERE TO SPRINT MECHANICS & BASE STEALING.**
- **HELPS OPTIMIZE:**
 - **FIRST-STEP SPEED**
 - **ACCELERATION**
 - **TIME TO BASE**

Reference: Turner, A. N., & Comfort, P. (2017). Advanced Strength and Conditioning: An Evidence-Based Approach.



WHY USE VBT IN BASE STEALING?

- **OBJECTIVELY MEASURES SPRINT SPEED AND IMPROVEMENT.**
- **TRACKS:**
 - **REACTION TIME**
 - **FIRST-STEP EXPLOSIVENESS**
 - **SPLIT TIMES (0-10 YD, 10-20 YD, 30 YD, 60YD)**
 - **TOTAL TIME FROM 1ST TO 2ND**
- **DATA ALLOWS TARGETED TRAINING FOR MAX IMPACT.**

Reference: Mann, J. B., Ivey, P. A., Mayhew, J. L., & Koch, A. J. (2015). Validity and Reliability of Velocity-Based Training in Sport.

KEY METRICS TO TRACK

METRIC

0-10 YD SPLIT

10-20 YD SPLIT

MAX VELOCITY (MPH OR M/S)

TIME TO 2ND BASE

STRIDE FREQUENCY/LENGTH

LOAD VELOCITY

WHY IT MATTERS

FIRST-STEP BURST

ACCELERATION/TOP-END SPEED

SPEED CAPACITY

GAME-READY APPLICATION

MECHANICAL EFFICIENCY

STRENGTH POWER CORRELATION

Reference: MLB Player Development Program (PDP) Testing Protocols, NSCA Guidelines



AGE-BASED BENCHMARKS

AGE GROUP	DISTANCE	AVG TIME TO 2ND	MAX VELOCITY
6U	~50-60 FT	6.5-7.5 SEC	~7-9 MPH
8U	~60 FT	5.5-6.5 SEC	~8-10 MPH
10U	~60 FT	5.0-6.0 SEC	~9-11 MPH
12U	~70 FT	4.5-5.5 SEC	~10-12 MPH
15U	~90 FT	3.8-4.6 SEC	~12-16 MPH
JV	90 FT	3.7-4.4 SEC	~14-17 MPH
VARSITY	90 FT	3.5-4.2 SEC	~15-18 MPH

Reference: MLB PDP, Performance Lab Testing Standards, NSCA Youth Training Recommendations

ELITE BENCHMARK TESTING (MLB & PDP)

TEST	DESCRIPTION	BENCHMARK
30-YARD SPRINT	MEASURES TOP-END SPEED & ACCELERATION	<3.80 SEC (ELITE HS/COLLEGE)
10-YARD SPLIT	FIRST-STEP EXPLOSION	<1.65 SEC
PRO SHUTTLE (5-10-5)	LATERAL QUICKNESS & AGILITY	<4.20 SEC
COUNTERMOVEMENT JUMP (CMJ)	VERTICAL POWER & REACTIVITY	26-34 IN (DEPENDING ON LEVEL)
DRIFT 2D	MEASURES MOVEMENT EFFICIENCY & DIRECTION CONTROL	STABLE TRAJECTORY, LOW DRIFT SCORE
DYNAMIC BROAD JUMP	LATERAL + HORIZONTAL EXPLOSIVE POWER	7'0"+ (VARSITY)
MAN IN THE BOX	COMBINES REACTION, AGILITY, & DECISION SPEED	<2.80 SEC (TOP TIER)

Reference: MLB PDP, Performance Lab Testing Standards, NSCA Youth Training Recommendations

HOW TO APPLY VBT IN TRAINING

- **ASSESS: TEST 0-10 YD & 60-90 FT SPRINTS.**
- **BASELINE: COMPARE AGAINST AGE AND ELITE METRICS.**
- **TRAIN: TARGET WEAK LINKS (E.G., FIRST-STEP VS TOP SPEED).**
- **RETEST: TRACK GAINS EVERY 4-6 WEEKS.**

Reference: NSCA Essentials of Strength Training and Conditioning (4th Edition)



SPRINT TRAINING METHODS

- **UNDER-SPEED DRILLS: DOWNHILL SPRINTS, BAND-ASSISTED RUNS.**
- **OVER-SPEED DRILLS: SLED PUSHES, WEIGHTED SPRINTS.**
- **SHORT BURST REPS: 5-10 YD BASE STEAL STARTS.**
- **CUE-BASED DRILLS: REACTION TO AUDIO/VISUAL STIMULI.**

Reference: Ken Clark, SMU Applied Biomechanics Lab Research; NSCA Sprint Guidelines



VBT IN THE WEIGHT ROOM

- TRACK BAR SPEED ON LIFTS (E.G., TRAP BAR DEADLIFTS).
- OPTIMAL SPEED FOR POWER: 0.75–1.0 M/S.
- COMBINE STRENGTH + SPEED = MAX STEAL POTENTIAL.

Reference: NSCA Velocity-Based Training Position Stand; Bryan Mann VBT Research



BUILDING THE FOUNDATION

- **BEFORE STARTING ANY PROGRAM, BUILD A STRONG BASE AND FOUNDATION.**
- **RECOGNIZE THE IMPORTANCE OF:**
- **MOBILITY & CONTROL – ESTABLISH MOVEMENT QUALITY.**
- **STRENGTH PHASE – DEVELOP MAX FORCE OUTPUT.**
- **POWER PHASE – LEARN TO EXPRESS STRENGTH QUICKLY.**
- **SPORT-SPECIFIC SPEED – APPLY IT TO BASE STEALING.**

Reference: NSCA Long-Term Athletic Development Model; Cressey Performance Systems



SUMMARY & TAKEAWAYS

- **VBT OFFERS MEASURABLE IMPROVEMENT IN BASE STEALING.**
- **FOCUS ON SPRINT MECHANICS + POWER DEVELOPMENT.**
- **USE AGE-APPROPRIATE AND ELITE BENCHMARKS.**
- **REASSESS REGULARLY FOR ATHLETE DEVELOPMENT.**

Reference: NSCA Long-Term Athletic Development Model; Cressey Performance Systems





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