



NSCA **COACHES** **CONFERENCE 2023**

JANUARY 4 – 6, 2023

Charlotte, NC & Online | 2.0 CEUs

#NSCACoaches23

CONFLICT OF INTEREST STATEMENT

I have no actual or potential conflict of interest in relation to this presentation.

DEVELOPING LINEAR SPEED for FIELD SPORT ATHLETES

NSCA COACHES CLINIC 2023

DUANE CARLISLE, MSc

THANK YOU | NSCA | PERFORM BETTER | ATTENDEES



Duane Carlisle, MSc
Developing Linear Speed for Field Sport Athletes





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Developing Linear Speed for Field Sport Athletes



SIMILAR INGREDIENTS | DIFFERENT RECIPE

THE CP APPROACH

- ALWAYS EVOLVING
- ASSESS DON'T GUESS
- TRAIN HARD, TRAIN SMART





RESPECT THE OLD
BUT SEEK OUT THE **NEW**

MY COACHING JOURNEY: ORGANIZATIONS

PRO SPORTS TEAMS (PAST POSITIONS)

FOOTBALL



SOCCER



LACROSSE



BASEBALL



COLLEGES (PAST POSITIONS)



CONSULTING & CEO CLIENTELE

CURRENT



PHYSICAL PREPARATION
COACH, NFL OFFICIALS



HIGH PERFORMANCE COACH FOR
5 FORTUNE 500 CEO'S

PAST



FORMER NIKE SPARQ
COUNCIL MEMBER



FORMER UNDER ARMOUR
PERFORMANCE COUNCIL MEMBER



Duane Carlisle, MSc
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PRINCIPLE STRATEGY TECHNIQUE

THE MOVEMENT CONTINUUM

COMPETENCY



LITERACY



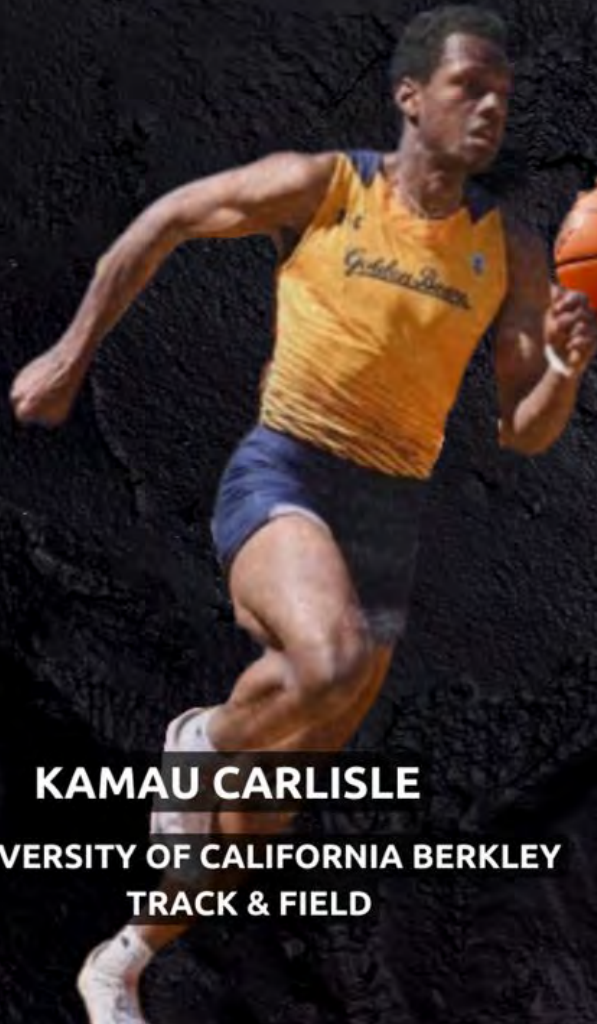
PROFICIENCY



THE PROCESS



MY BOYS



KAMAU CARLISLE

UNIVERSITY OF CALIFORNIA BERKLEY
TRACK & FIELD



NAI CARLISLE

SAN JOSE STATE UNIVERSITY
BASKETBALL



AMIR CARLISLE

NOTRE DAME UNIVERSITY
FOOTBALL

ATHLETIC PROFILE

The image shows a vertical stack of two screenshots from a software application. The top screenshot is a form titled 'BRUCE WAYNE' and 'CARLISLE ATHLETIC PROFILE'. It contains several sections with tables and checkboxes, including 'PERFORMANCE ANATOMY', 'IN-STUDIO MOVEMENT ASSESSMENT', 'CHANGE OF DIRECTION ANALYSIS', 'MOBILITY', 'STRENGTH', 'VERTICAL JUMP PROFILE', 'SPEED', and 'FORCE PLATE ANALYSIS'. The bottom screenshot shows a continuation of the form with more detailed data entry fields and graphs.



PERFORMANCE ANATOMY



IN-STUDIO MOVEMENT ASSESSMENT



CHANGE OF DIRECTION ANALYSIS



MOBILITY



STRENGTH



VERTICAL JUMP PROFILE



SPEED



FORCE PLATE ANALYSIS

SPEED PROFILE



**INITIAL
ACCELERATION**

ACCELERATION

TOP SPEED

Step Zero

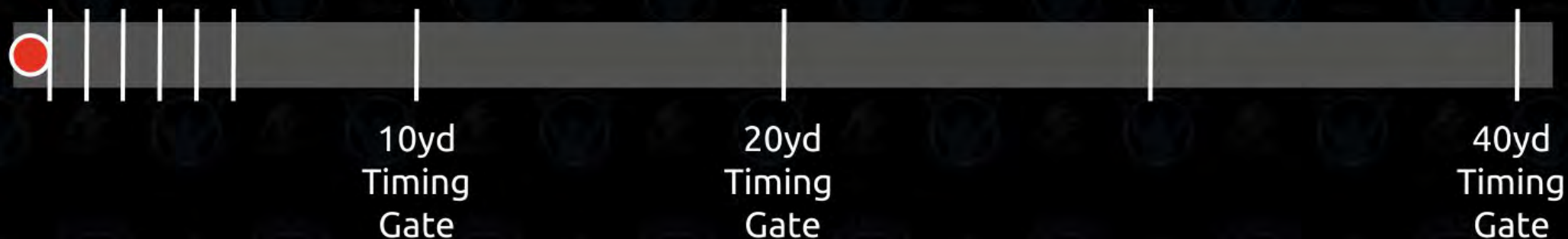
6 - 10 Steps

10+ Steps

SPEED PROFILE



40 YARD SPRINT TRIAL



SPEED PROFILE



40 YARD SPRINT TRIAL



SPEED PROFILE

DATA ANALYSIS

FIRST STEPS ANALYSIS

SPEED MARKERS

SPRINT METRICS

FORCE PRODUCTION

POWER PRODUCTION

KEY FORCE-VELOCITY METRICS

SPEED PROFILE | QUALITATIVE



MOVEMENT ASSESSMENT

QUANTITATIVE

5 Yard Sprint

10 Yard Sprint

Agility Test



QUALITATIVE

Running Mechanics
Analysis Priorities

Change Of Direction
Analysis Priorities

Posture Leg Action
Arm Action

Foot Strike Trunk Position
Shin Angle Triple Extension

IN-STUDIO MOVEMENT ASSESSMENT				
TEST	DATE	SCORE	COLOR	GOAL
5YD SPRINT	10/10/22	1.44		1.37
10YD SPRINT	10/10/22	2.49	RED	2.37
5-10-5 AGILITY TEST	10/10/22	6.31		6
RUNNING MECHANICS ANALYSIS PRIORITIES				
COD ANALYSIS PRIORITIES				
• FOOT STRIKE • SHIN ANGLE • TRUNK POSITION • TRIPLE EXTENSION				



SPEED PROFILE | QUANTITATIVE

FORCE PRODUCTION		FIRST STEPS ANALYSIS						SPEED MARKERS			
TOP HORIZONTAL FORCE OUTPUT (N)	RELATIVE FORCE PRODUCTION (N/LB)		1YD	2YD	3YD	4YD	5YD	DISTANCE @ 70% TOP SPEED (YD)	DISTANCE @ 80% TOP SPEED (YD)	DISTANCE @ 90% TOP SPEED (YD)	DISTANCE @ 95% TOP SPEED (YD)
878	3.03	SPEED (MPH) →	6.9	9.1	10.7	11.9	12.8	6.7	10.7	18.5	26.8
ORANGE		% TOP SPEED →	34%	45%	53%	59%	64%				
SPRINT METRICS											
TOP SPEED REACHED (MPH)	THEORETICAL TOP SPEED (MPH)	TIME TO TOP SPEED	DISTANCE TO TOP SPEED (Y)	RATIO OF INITIAL FORCE RF	ACCELERATION DECAY RATE DRF	MAX POWER VELOCITY (MPH)					
19.07	20.07	4.00	26.8	57%	-6.42%	9.95					
ORANGE				BLUE	YELLOW	ORANGE					
POWER PRODUCTION				KEY FORCE-VELOCITY CHARACTERISTICS							
PEAK POWER (WATTS)	RELATIVE PEAK POWER (W/LB)	DISTANCE TO PEAK POWER (Y)	STEPS TO PEAK POWER	INITIAL ACCELERATION (M/S/S)	CALCULATED TOP SPEED (MPH)	FORCE-VELOCITY RELATIONSHIP					
2020	6.96	2.48	1	6.66	19.84	0.7					
ORANGE				RED	ORANGE	BALANCED EMPHASIS					

SPEED PROFILE PRIORITY SYSTEM

VERY LOW PRIORITY

LOW PRIORITY

MODERATE PRIORITY

HIGH PRIORITY

VERY HIGH PRIORITY

SPEED PROFILE

DATA ANALYSIS

KEY FORCE-VELOCITY METRICS

- Initial Acceleration
- Calculated Top Speed
- Force Velocity Relationship

KEY FORCE-VELOCITY CHARACTERISTICS		
INITIAL ACCELERATION (M/S/S)	CALCULATED TOP SPEED (MPH)	FORCE-VELOCITY RELATIONSHIP
6.66	19.84	0.7
RED	ORANGE	BALANCED EMPHASIS

SPEED PROFILE

DATA ANALYSIS

SPRINT METRICS

- ☐ Top Speed
- ☐ Theoretical Top Speed
- ☐ Time To Top Speed
- ☐ Distance To Top Speed

SPRINT METRICS						
TOP SPEED REACHED (MPH)	THEORETICAL TOP SPEED (MPH)	TIME TO TOP SPEED	DISTANCE TO TOP SPEED (Y)	RATIO OF INITIAL FORCE RF	ACCELERATION DECAY RATE DRF	MAX POWER VELOCITY (MPH)
19.07	20.07	4.00	26.8	57%	-6.42%	9.95
ORANGE				BLUE	YELLOW	ORANGE

SPEED PROFILE

DATA ANALYSIS

POWER PRODUCTION

- ☐ Peak Power
- ☐ Relative Peak Power
- ☐ Distance To Peak Power
- ☐ Steps To Peak Power

POWER PRODUCTION			
PEAK POWER (WATTS)	RELATIVE PEAK POWER (W/LB)	DISTANCE TO PEAK POWER (Y)	STEPS TO PEAK POWER
2020	6.96	2.48	1
ORANGE			

SPEED PROFILE

DATA ANALYSIS

FORCE PRODUCTION

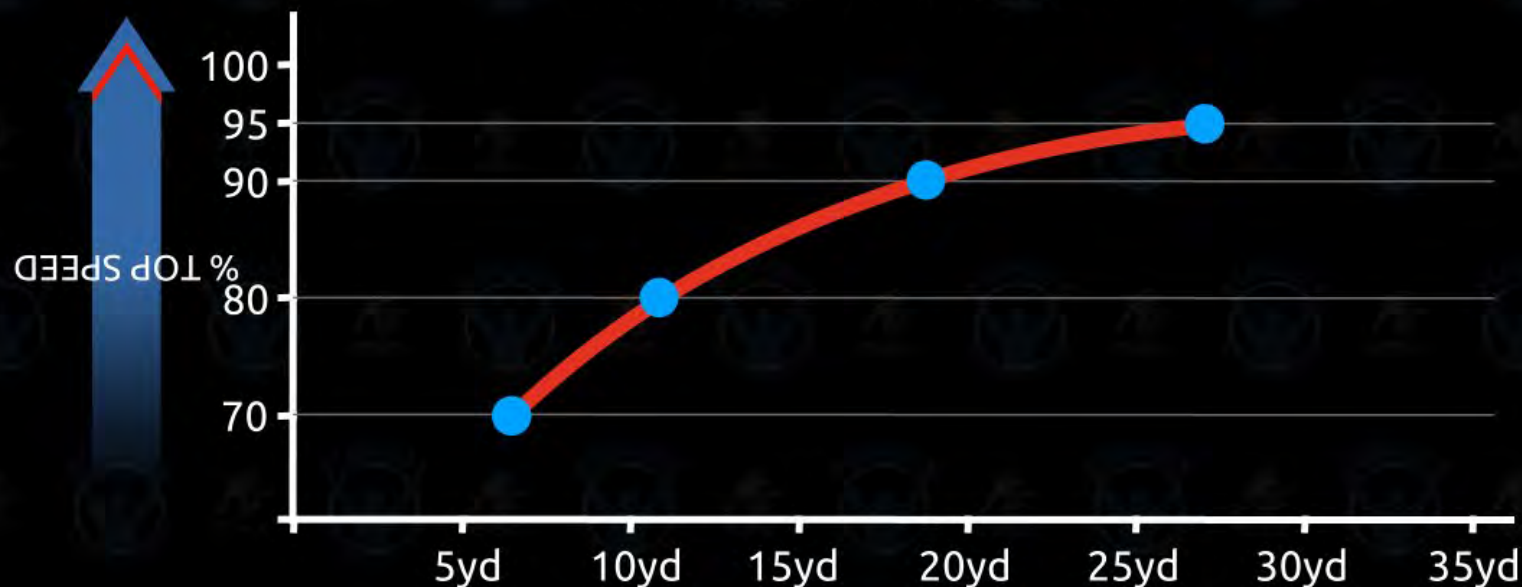
- ☐ Top Horizontal Force Output
- ☐ Reative Force Production

FORCE PRODUCTION	
TOP HORIZONTAL FORCE OUTPUT (N)	RELATIVE FORCE PRODUCTION (N/LB)
878	3.03
ORANGE	

SPEED PROFILE

DATA ANALYSIS

SPEED MARKERS

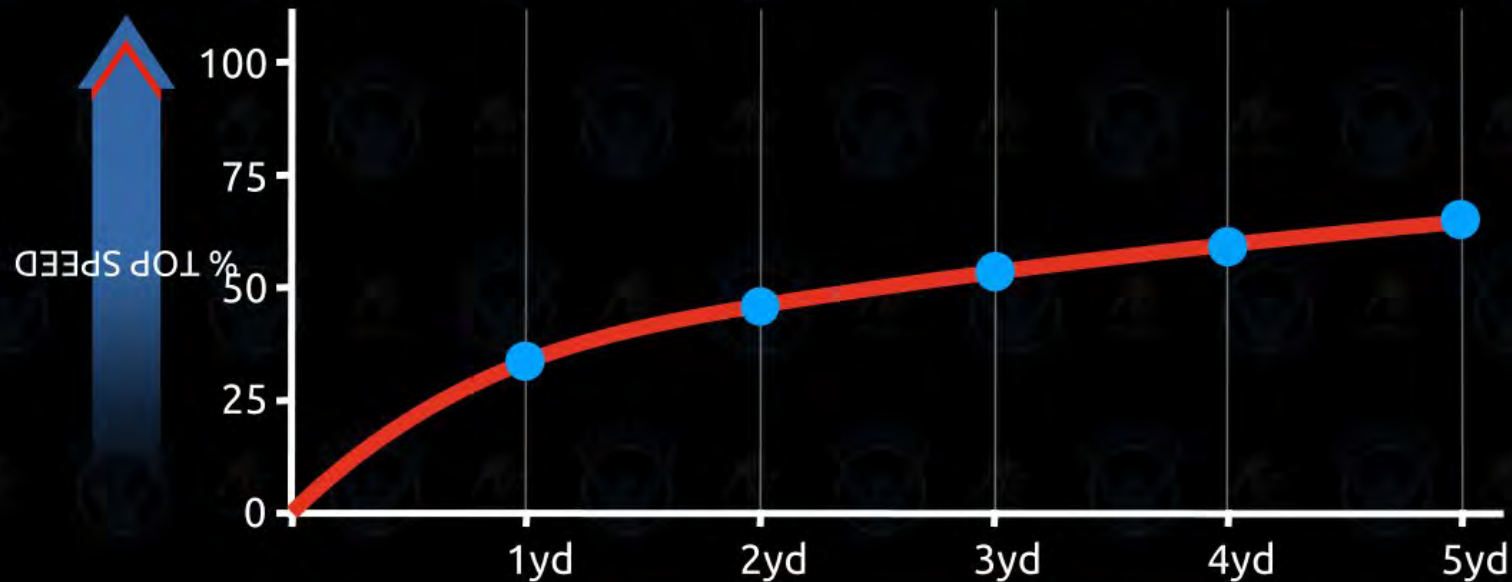


SPEED MARKERS			
DISTANCE @ 70% TOP SPEED (YD)	DISTANCE @ 80% TOP SPEED (YD)	DISTANCE @ 90% TOP SPEED (YD)	DISTANCE @ 95% TOP SPEED (YD)
6.7	10.7	18.5	26.8

SPEED PROFILE

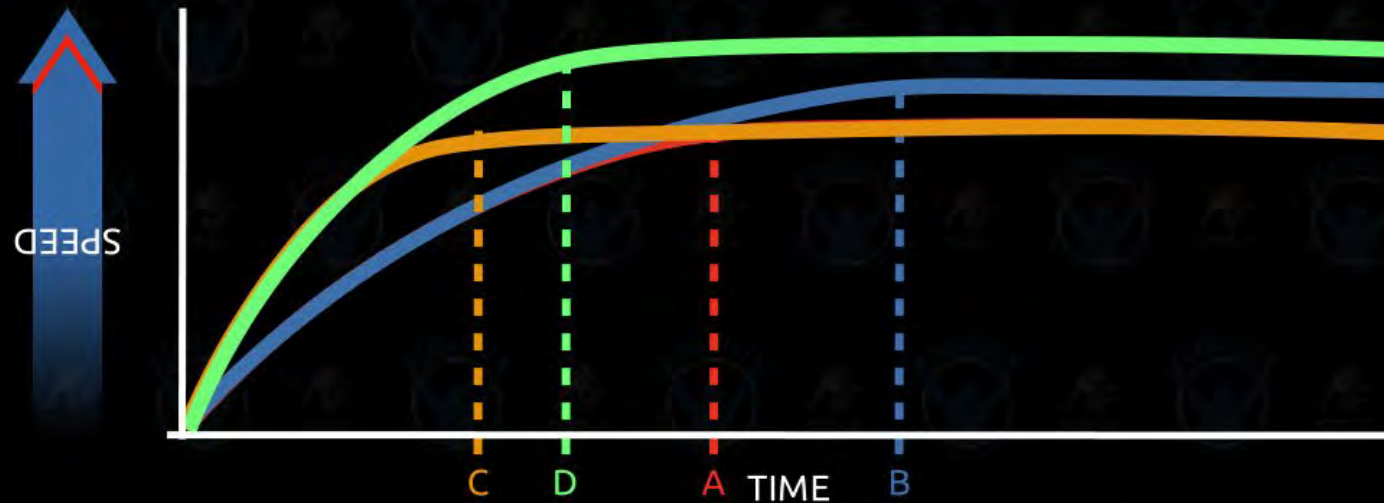
DATA ANALYSIS

FIRST STEPS ANALYSIS



FIRST STEPS ANALYSIS					
	1YD	2YD	3YD	4YD	5YD
SPEED (MPH)	6.9	9.1	10.7	11.9	12.8
→ % TOP SPEED	34%	45%	53%	59%	64%

SPEED PROFILE





STRUCTURED WORKOUT PLAN

MOVEMENT TRAINING

PRE-WORKOUT
PREP

MOVEMENT
PREP

MOVEMENT
TRAINING

Acceleration

Arm Action
Posture
Leg Action
Projection
Acceleration
Application

Max Velocity

Arm Action
Posture
Leg Action
Strike Force
Max Velocity
Application

Multi-Directional

Posture/Footwork
Athletic Stance
Deceleration
Back Pedal
Movement Skills

ACCELERATION PREP SERIES

FOOT & ANKLE PREP



HIP PROJECTION | BASE POSITION



ACCELERATION | DEVELOPMENTAL

HORIZ | PLYO'S

- BROAD JUMPS
- POWER SKIPS FOR DISTANCE

SPEED PREP

- WALL DRILL SERIES
- FIRST-STEP PROJECTION
- STARTS | 5 YARDS

SPEED SESSION

- 8 REPS X 15 YARDS, CONTRAST SLEDS
- 2 X 15 YARDS SLEDS @ 20% VDEC



LET'S STAY IN TOUCH!

@COACHDUANECARLISLE



CARLISLE
PERFORMANCE SYSTEMS



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NSCA COACHES
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