

SISTEM ENERGI

BOLA BASKET



SISTEM ENERGI

- ❖ **Sistem energi**

Merupakan serangkaian proses pemenuhan tenaga secara terus menerus dan saling bekerja bergantian **(Soekarman, 1991: 17)**.

- ❖ **Sistem Energi Predominan Pada Cabang Olahraga**

Aktivitas olahraga pada umumnya tidak hanya secara murni menggunakan salah satu sistem aerobik atau anaerobik saja.

Sebenarnya yang terjadi adalah menggunakan gabungan sistem aerobik dan anaerobik, akan tetapi porsi kedua sistem tersebut berbeda pada setiap cabang olahraga **(Fox, dkk. 1988 dan Janssen, 1989)**

Untuk cabang olahraga yang menuntut aktivitas fisik dengan intensitas tinggi dengan waktu relatif singkat, sistem energi predominannya adalah anaerobik, sedangkan pada cabang olahraga yang menuntut aktivitas fisik dengan intensitas rendah dan berlangsung relatif lama, sistem energi predominannya adalah aerobik.

ANALISIS KEBUTUHAN FISIK PEBASKET

1. Karakteristik Permainan Bola Basket hubungannya kebutuhan Fisik

Durasi Pertandingan (4x10 Menit) – (*Endurance + Speed Endurance*).

Body Contact (Fight Screen, Box Out, Create Contact (*Balance, Strength*))

Defense (Defensive Stance (Stay Low), Run Forward/Backward, Sprint, Sprint Close Out, Slide, Shuffle (Lateral Move), (**Agility**), Block Shot , Box Out (**Strong and Powerful**), Rebounding, Fight Screen, Push Out)

Offense (Dribble series : In and Out Crossover, Hesitation (Agility), Jump Shot (Balance), Tip In n Dunk (**Power**), Sprint, Change Of Pace, Change Of Direction (**Speed**), First Step (Starting Power), Spin Move, (**Mobility/Flexibility**), In and Out, Crossover, Behind the Back, between the leg (**Agility, Footwork, Coordination**))

Transisi (*Fast Break on Offense, Penetrasi, (speed)*)

ANALISIS KEBUTUHAN FISIK PEBASKET

2. Sistem Energi 80% Anaerobik dan 20 % Aerobik

Karakteristik bola basket adalah olahraga yang membutuhkan metabolisme energi anaerobik. Namun demikian, metabolisme aerobik pun berkontribusi sekitar 20 % untuk memenuhi kebutuhan energi selama pertandingan berlangsung. Meskipun kebutuhan anaerobik lebih dari aerobik, kapasitas aerobik atau V_{O2max} diperlukan untuk pemulihan (recovery) dari aktifitas dengan intensitas tinggi pada permainan bola basket.

Bompa (1994: 27) dan Brittenham (1998: 3)

ANALISIS KEBUTUHAN FISIK PEBASKET

3. Posisi Pemain secara khusus

Permainan ini memiliki berbagai macam posisi, sehingga kebutuhan akan kemampuan dalam meningkatkan penampilan di dalam pertandingan juga cukup beragam (**Point Guard, Shooting Guard, Small Forward, Power Forward, dan Center**) dari keanekaragaman posisi ini sudah barang tentu kebutuhan akan fisik, teknik, taktik dan strategi, psikologi dan fisiologis sudah pasti berbeda. Pemain bola basket adalah atlet yang luar biasa. Mereka **cepat, lincah**, penuh **daya ledak**, mempunyai **daya tahan** dan **kekuatan** yang istimewa, juga dalam proses pulih asal (**recovery**)

SISTEM ENERGI BOLA BASKET

01

SPEED ENDURANCE

kemampuan seseorang berpindah tempat (lari cepat) dengan waktu yang singkat berulang kali tanpa merasakan kelelahan yang berarti.

02

POWER ENDURANCE

kemampuan seseorang melakukan gerakan eksplosif dengan waktu yang singkat berulang kali tanpa merasakan kelelahan yang berarti.



01

URUTAN PEMBENTUKAN SPEED ENDURANCE

I

ENDURANCE

Melatih Daya tahan

II

SPEED

Melatih Kecepatan

III

KONVERSI SPEED + ENDURANCE

Melatih menjadikan Speed Endurance






ENDURANCE

(Latihan Endurance untuk mendukung latihan speed endurance)

PERIODESASI DAYA TAHAN



Periodisasi	Persiapan		Kompetisi		Transition
	Umum	Khusus	Pra	Kom Utama	Transition
Endurance (Daya tahan)	Aerobic Endurance	Dev Spec End		Main. End & Sport Specific End	Aerobic Endurance



PERIODESASI DAYA TAHAN

Periodisasi Daya Tahan (Endurance Periodization)

General Preparation		Specific Prep	Pre Comp	Competition	Transition
Aerobic Endurance		Development Specific Endurance		Main. End & Sport Specific End	Compensation
Aerobic Foundation	Aerobic Development	An Aerobic Treshold	Lactat Tolerance & Aerobic Max		Aerobic Foundation / Aerobic Development
4 – 8 minggu	8 – 12 minggu	8 – 12 minggu	8 – 24 minggu		4 minggu



Hubungan Sistem Energi Dengan Waktu

Duration	Classification	Energy Supplied By
1-4 seconds	Anaerobic	ATP (in muscles)
4-20 seconds	Anaerobic	ATP + PC
20-45 seconds	Anaerobic	ATP + PC + Muscle glycogen
45-120 seconds	Anaerobic, Lactic	Muscle glycogen
120-240 seconds	Aerobic + Anaerobic	Muscle glycogen + lactic acid
240-600 seconds	Aerobic	Muscle glycogen + fatty acids

A silhouette of a person in a dark purple background, holding a red ball with both hands raised. The person is positioned on the left side of the slide, and the ball is a solid red circle.

Daya Tahan (Endurance)

Tujuan latihan daya tahan adalah :

- Menekan Denyut Nadi istirahat (Nadi Basal) serendah mungkin
- Mendorong Denyut Nadi kerja maksimal setinggi mungkin
- Menggeser Defleksi Aerobik - Anaerobik selambat mungkin
(periode kerja aerobik lebih panjang dari sebelumnya walaupun Denyut Nadi sudah tinggi > 180X/menit)

Phase Persiapan Umum

Daya tahan Aerobik
(Aerobic Endurance)



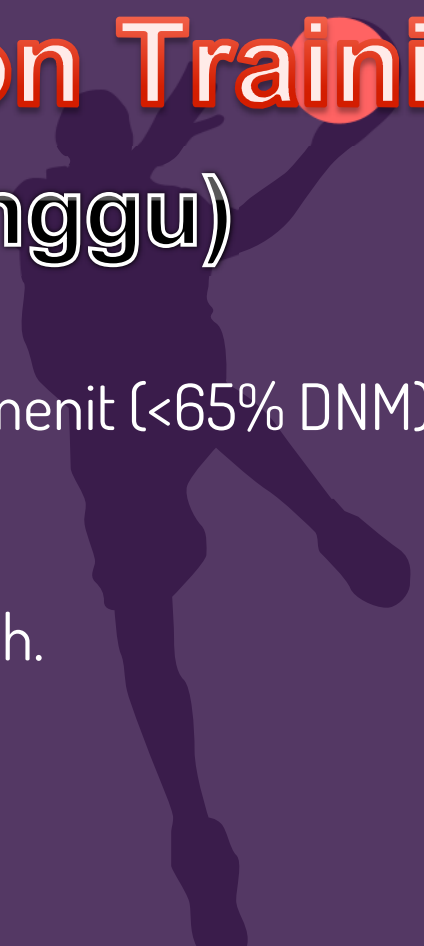


Hubungan Sistem Energi Dengan Waktu

Duration	Classification	Energy Supplied By
1-4 seconds	Anaerobic	ATP (in muscles)
4-20 seconds	Anaerobic	ATP + PC
20-45 seconds	Anaerobic	ATP + PC + Muscle glycogen
45-120 seconds	Anaerobic, Lactic	Muscle glycogen
120-240 seconds	Aerobic + Anaerobic	Muscle glycogen + lactic acid
240-600 seconds	Aerobic	Muscle glycogen + fatty acids

Aerob Foundation Training

(4 – 8 minggu)

A silhouette of a basketball player in mid-air, holding a basketball with both hands, positioned behind the main title text.

Latihan dengan denyut nadi 130 – 140 X/menit (<65% DNM)

Lamanya latihan 60 menit – 2 jam

Bentuk latihan **slow continuous run**

Ciri utama, volume besar intensitas rendah.

Aerobic Development

(8 – 12 minggu)

A silhouette of a basketball player in mid-air, holding a red basketball. The player is wearing a dark jersey and shorts. The background is a dark purple gradient with a lighter purple arc on the left side.

Latihan dengan denyut nadi 150 – 160 X/menit (65 – 80%)

Lamanya latihan 30 – 60 menit

Istirahat 2 – 3 menit (130 DN)

Bentuk latihan **continuous run** dengan intensitas meningkat, dapat juga dengan **cross country** (seperti continuous run tapi di alam terbuka)

Phase Persiapan Khusus

**Membangun
Daya Tahan Khusus
(Development Specific Endurance)**

A silhouette of a basketball player in mid-air, shooting a red ball. The player is positioned on the right side of the slide, with their arms extended upwards. The background is a dark purple gradient with a lighter purple arc on the left side.

An Aerobic Treshold

(8 – 12 minggu)

A silhouette of a basketball player in mid-air, holding a basketball, positioned on the right side of the slide.

Latihan dengan denyut nadi 170 X/menit (80 – 100 % DNM)

Lamanya latihan 2 menit – 12 menit

Pengulangan 3 – 8 kali

Interval < 3 menit

Bentuk latihan **interval training**

Phase Pra Kompetisi

**Membangun
Daya Tahan Khusus
(Development Specific Endurance)**

A silhouette of a basketball player in mid-air, shooting a red ball. The player is positioned on the right side of the slide, with their arms extended upwards and hands near the ball. The background is a dark purple gradient with a lighter purple arc on the left side.

Lactat Tolerance

(8 – 12 minggu)

A dark purple silhouette of a basketball player in mid-air, shooting a red ball. The player is positioned on the right side of the slide, with their right arm extended upwards and their left leg bent. The background is a dark purple gradient with a lighter purple arc on the left side.

Latihan dengan denyut nadi 185 – 195x / menit

Lamanya latihan 30 – 90 detik

Lama durasi latihan 8 minggu

Perbandingan 1 : 1 (kerja : istirahat)

Pengulangan 3- 4 kali

2 – 3 set

Istirahat antar set 10 – 20 menit (istirahat aktif)

Bentuk latihan **Interval Training – Speed Agility and Quicknes (SAQ)**

Aerobic Maksimal

(8 – 12 minggu)

A silhouette of a basketball player in mid-air, jumping to shoot a ball. The player is wearing a jersey and shorts, and the ball is visible in their hands. The background is a dark purple gradient.

Latihan dengan denyut nadi 200 – 206x / menit (DN Kompetisi / Pertandingan)

Lamanya latihan 5 menit

Lama durasi latihan 8 minggu

Perbandingan 1 : 1 (kerja : istirahat)

Pengulangan 3- 4 kali

2 – 3 set

Istirahat antar set 10 – 20 menit (istirahat aktif)

Bentuk latihan **Full Speed – Speed Endurance** (bisa jarak mencapai 1600 meter)

Phase Kompetisi

**Menjaga Daya Tahan
&**

**Daya Tahan Khusus
(Main. End & Sport Specific End)**



Lactat Tolerance & Aerobic Maximal

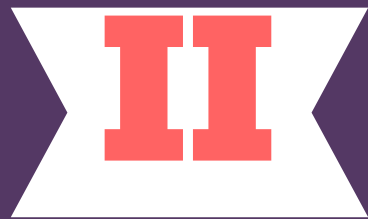
(1 – 2 Minggu)

A silhouette of a basketball player in mid-air, shooting a red ball. The player is positioned on the right side of the slide, with their arms extended upwards and one leg bent. The background is a dark purple gradient with a lighter purple arc on the left side.

- Latihan dengan maksimal intensitas (DN Kompetisi)
- Diarahkan ke bentuk kecabangan & kompetisi
- Istirahat antar pengulangan 1 – 2 menit
- Istirahat antar set 5 – 10 menit (Aktif) jalan/joging
- Bentuk latihan full speed

Dan kemudian diarahkan pada kebutuhan cabang olahraga (SAQ Training)


Ciri utama : Volume rendah Intensitas tinggi
(sesuai dengan grafik volume dan intensitas yang tertera di periodisasi)



KECEPATAN **(Speed Endurance)**

(Latihan Kecepatan untuk membentuk speed endurance)

PERIODESASI KECEPATAN



	Persiapan		Kompetisi		Transition
	Umum	Khusus	Pra	Kom Utama	Transition
Speed	Anaerobic Foundation (ABC's)	Maximum Speed and Anaerobic Endurance	Maximum speed, Specific speed, Agility, Reactive agility	Sport-specific maintenance, Specific speed, Agility, Reactive agility	

PERIODESASI KECEPATAN

Periodisasi Kecepatan (Speed Periodization)

General Preparation	Specific Prep	Pre Comp	Competition	Transition
Anaerobic Foundation (ABC's)	Maximum Speed and Anaerobic Endurance	Maximum speed, Specific speed, Agility, Reactive agility	Sport-specific maintenance, Specific speed, Agility, Reactive agility	Recovery
Run ABS's & Anaerobic	An Aerobic Power & Long Speed Endurance	An Aerobic Power, Functional SAQ Training	Functional SAQ Training	Cross training/recovery training
4 – 8 minggu	8 – 12 minggu	8 – 12 minggu	8 – 12 minggu	4 minggu



Hubungan Sistem Energi Dengan Waktu

Duration	Classification	Energy Supplied By
1-4 seconds	Anaerobic	ATP (in muscles)
4-20 seconds	Anaerobic	ATP + PC
20-45 seconds	Anaerobic	ATP + PC + Muscle glycogen
45-120 seconds	Anaerobic, Lactic	Muscle glycogen
120-240 seconds	Aerobic + Anaerobic	Muscle glycogen + lactic acid
240-600 seconds	Aerobic	Muscle glycogen + fatty acids

Phase Persiapan Umum

ABC's

**Dasar Dasar Kecepatan
(Foundation of Speed)**



Agility, Balance, Coordination, Speed (ABC's) & An aerobic

4 – 8 minggu

1. Melatih Teknik Berlari yang benar
2. Efisiensi Dalam bergerak
3. Koordinasi gerak
4. Keseimbangan statis dan dinamis
5. kelincahan



Metode Melatih Dasar Dasar Kecepatan Dengan Koordinasi Gerak



1. Arm swing

2. Angkling

3. Butt kickers

4. Knee Up

5. Kicking

6. Clawing

7. Step by step (*all bout running Mechanic*)

8. Variasi Latihan Koordinasi

Training parameter

Distance	10 – 15 meter
Set	2 – 4 each

Aerobic & An Aerobic Endurance

Training Parameter	Extensive Tempo (Aerobic Capacity & Aerobic Power)	Intensive Tempo (Anaerobic Capacity)
Distance	> 200 Meter	> 80 Meter
Intensity	70 % Max speed	80 % - 90% Max speed
Rest Between Repetition	45 Second	30 s – 5 min
Rest Between set	2 min	3 – 10 min

Phase Persiapan Khusus

Maximum Speed

&

An Aerobic Endurance



A dark purple silhouette of a basketball player in mid-air, holding a red basketball. The player is positioned on the right side of the slide, with their arms extended upwards and slightly to the left, holding the ball. The background is a dark purple gradient with a lighter purple arc on the left side.


An Aerobic Power & Long Speed Endurance

8 – 12 minggu

Phase Pra Kompetisi

Maximum Speed, Specific Speed, Agility, Reactive Agility

Metode khusus dan drill paling dominan dalam pengembangan kecepatan khusus dan perbaikan kemampuan yang terkait (abilities), seperti waktu bereaksi dan Kelincahan (*agility*). Selama tahap kompetisi intensitas latihan ditingkatkan pada metode latihan khusus



**An Aerobic Power
&
Functional SAQ Training**
8 – 12 minggu

Phase Kompetisi

**Sport Specific Maintenance,
Specific Speed, Agility,
Reactive Agelity**



Sport-specific preparations, Functional SAQ Training

8 – 12 minggu

Fase ini mengarahkan latihan pada kebutuhan sistem energi cabang

Disesuaikan dengan kebutuhan kecepatan, kelincahan serta reaksi

cabang masing masing



KEKUATAN **(Power Endurance)**

(Latihan Kekuatan untuk membentuk power endurance)

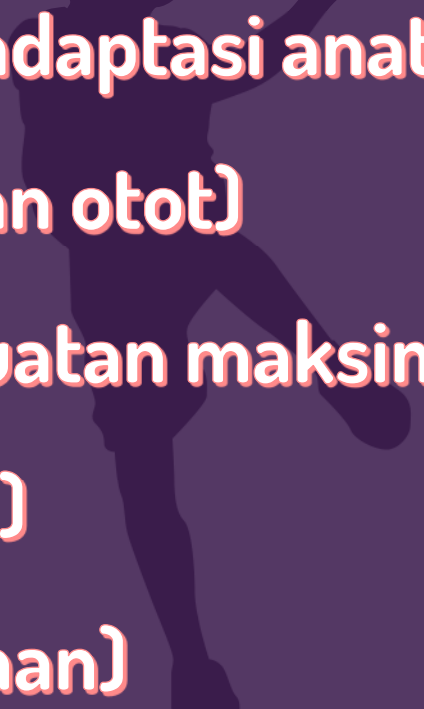
Periodisasi Kekuatan

Periodisasi	Persiapan		Kompetisi		Transisi
	Umum	Khusus	Pra	Kom Utama	Transisi
Strength	Anatomical Adaptation	Hypertrophy Max Strength	Conversion - Power - Musc End - Power End	Maintenance of Power or Maximal Strength	C Compensation

Periodisasi Kekuatan

Periodisasi Kekuatan (Strength Periodization)					
General Preparation		Specific Prep	Pre Comp	Competition	Transition
Anatomical Adaptation	Hypertrophy /Max Strength	Conversion - Power - Musc End - Power End	Maintenance of Power or Maximal Strength	C /unloading	Compensation
Circuit Training	Set sistem Pyramid	TCSSM Plyometrics	Plyometrics/power training/ballistic method		Cross training/recovery training
4 – 10 minggu	4 – 12 minggu	4 – 8 minggu	8 – 16 minggu	1 minggu	1 – 4 minggu

Periodisasi Latihan Kekuatan

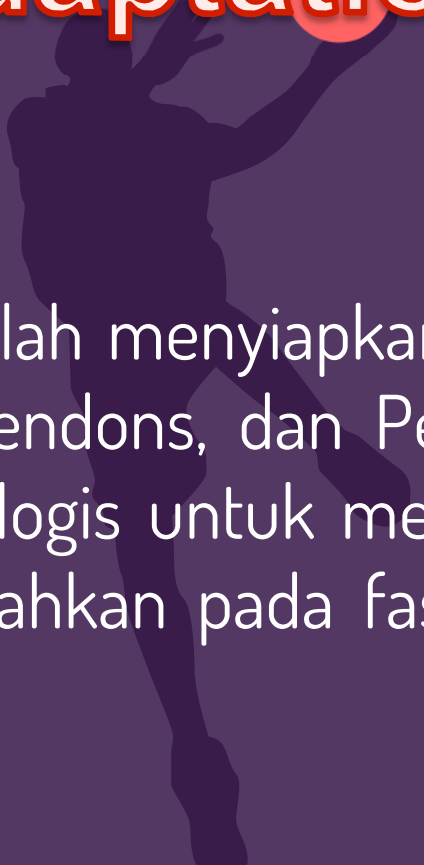
- Anatomical Adaptation (adaptasi anatomi)
 - Hypertrophy (pembesaran otot)
 - Maximum Strength (kekuatan maksimal)
 - Conversion (pengubahan)
 - Maintenance (pemeliharaan)
- 
- A silhouette of a basketball player in mid-air, shooting a red ball. The player is positioned on the right side of the slide, with their arms extended upwards and hands near the ball. The background is a dark purple gradient with a lighter purple arc on the left side.



Adaptasi Anatomi (Anatomical Adaptation)

4 – 10 minggu

Anatomical Adaptation (AA)

A dark purple silhouette of a basketball player in mid-air, reaching up with both hands to catch or shoot a red basketball. The player is positioned on the right side of the slide, partially overlapping the title text.

Tujuan utama dari tahapan ini adalah menyiapkan seluruh komponen otot-otot, ikat sendi, tendons, dan Persendian sehingga beradaptasai secara fisiologis untuk menghadapi fase latihan yang lama dan melelahkan pada fase – fase berikutnya

Metode Melatih (AA)

Circuit Training

1. Dengan beban sendiri
2. Weight Training (free weight, weight training machine)
3. Medicine Ball

Short Circuit	6 - 9 Alat
Medium Circuit	9 - 12 Alat
Long Circuit	12 - 15 Alat

Parameter untuk circuit training (AA)

Training Parameters	Novice Athletes	Experienced Athletes
Duration of AA	8 – 10 minggu	3 – 5 minggu
Load (Intensity)	30 – 40%	40 – 60%
Time per station	30 – 90 detik	
No of stations per circuit	9 – 12 (15)	6 – 9
No of circuit per session	2 – 3	3 – 5
Total time of CT session	20 – 25 menit	30 – 40 menit
Rest interval between exercise	90 detik	60 detik
Rest interval between circuits	2 – 3 menit (CT amount)	1 – 2 menit (CT amount)
Frequency per week	2 - 3	3 - 4

Pola aktivitas :

- Jumlah repetisi/limit waktu
- Irama gerakan sedang/dinamis
- Own body weight, weight training machine, medicine ball

Contoh, Circuit Training

CT own body weight

1. Push up
2. Sit up
3. Squat trush
4. Back up
5. Pull up
6. Deeping
7. Calf raises
8. Wall squat

CT Weight Machine

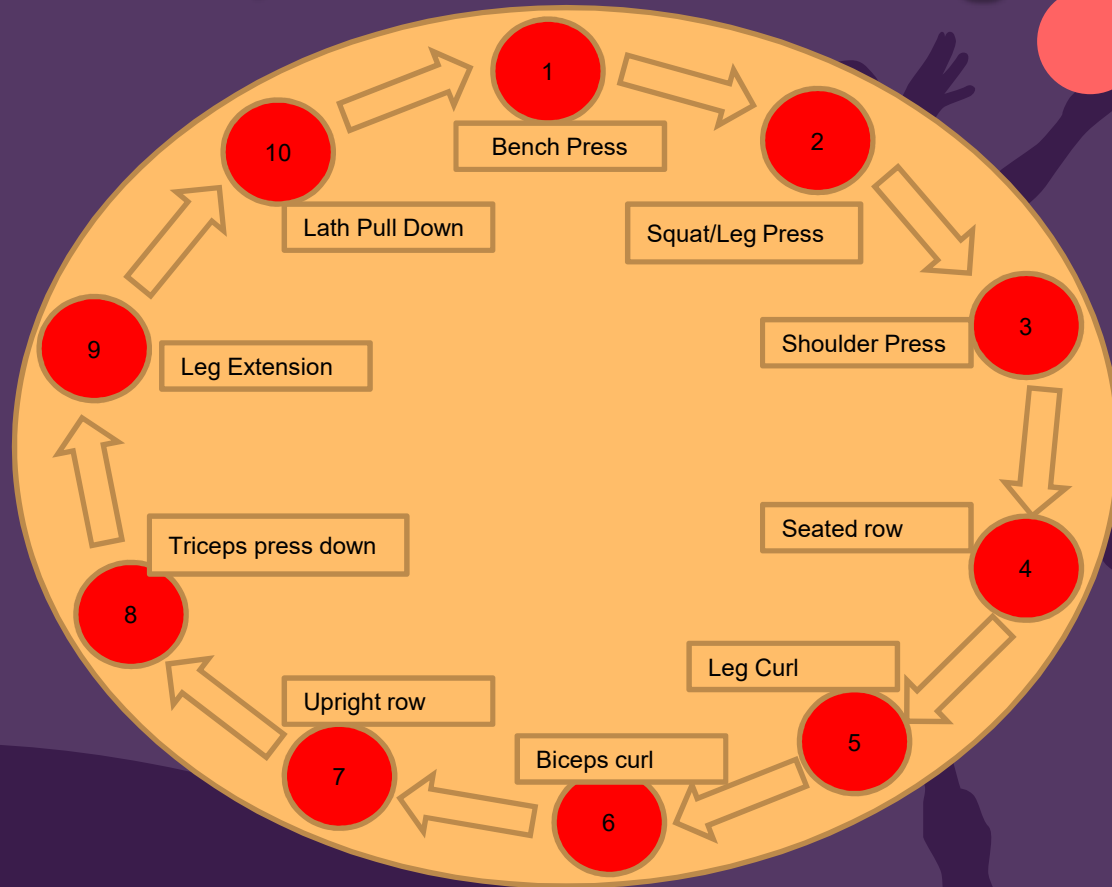
1. Bench Press
2. Squat/Leg Press
3. Leg Extension
4. Leg Curl
5. Lath Pull Down
6. Shoulder Press
7. Seated row
8. Biceps curl
9. Triceps press down
10. Upright row

Contoh, Circuit Training

Sample Circuit Training Workout (Bodyweight)

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Intensity						
Squat jumps	30sec	45sec	60sec	45sec	60sec	60sec
Push ups	30sec	45sec	60sec	45sec	60sec	60sec
Lunges	30sec	45sec	60sec	45sec	60sec	60sec
Crunches	30sec	45sec	60sec	45sec	60sec	60sec
Burpees	30sec	45sec	60sec	45sec	60sec	60sec
Bench dips	30sec	45sec	60sec	45sec	60sec	60sec
Squat thrusts	30sec	45sec	60sec	45sec	60sec	60sec
Supermans	30sec	45sec	60sec	45sec	60sec	60sec
Rest between stations	60sec	60sec	60sec	60sec	60sec	45sec
Rest between circuits	3min	3min	3min	3min	3min	3min
No. Circuits	2	2	2	2	3	3

Contoh, Circuit Training





Pembesaran Otot (Hypertrophy)

4 – 12 minggu

Hypertrophy



Training Parameters	Work
Duration of hypertrophy phase	4 – 6 week
Load (Intensity)	60 – 80% RM
Number of Exercises	6 – 9 item
Number of repetition per set	6 – 12 rep
Number of sets per session	4 – 6 (8) set
Rest interval	3 – 5 minutes
Speed of execution	Slow to medium
Frequency per week	2 -4 time



Kekuatan Maksimal (Maximum Strength)

4 – 12 minggu

Maximum Strength Phase



Metode Orthodox

Menjembatani latihan untuk meningkatkan kekuatan maksimal dan latihan untuk meningkatkan kekuatan yang cepat digunakan latihan kekuatan dengan metode konservatif (Orthodox) :

Training Parameters	Work
Volume Load (Intensity)	40% - 60% Max
Set	3 – 6 (7) set
Repetisi	8 – 12 repetisi
Istirahat tiap set	1 – 2 menit

Maximum Strength Phase

Contoh :

Set System

Set I

Beban 60% max

10 repetisi

Set II

Beban 60% max

10 repetisi

Set III

Beban 60% max

10 repetisi

Set IV

Beban 60% max

10 repetisi

Set V

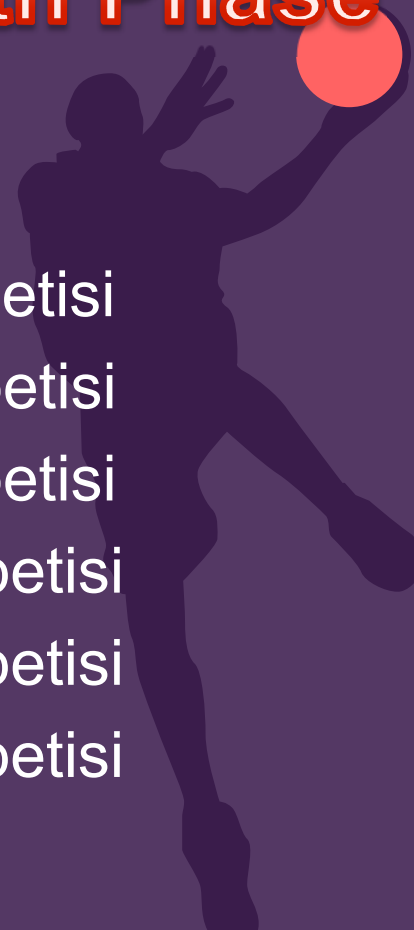
Beban 60% max

10 repetisi

Set VI

Beban 60% max

10 repetisi

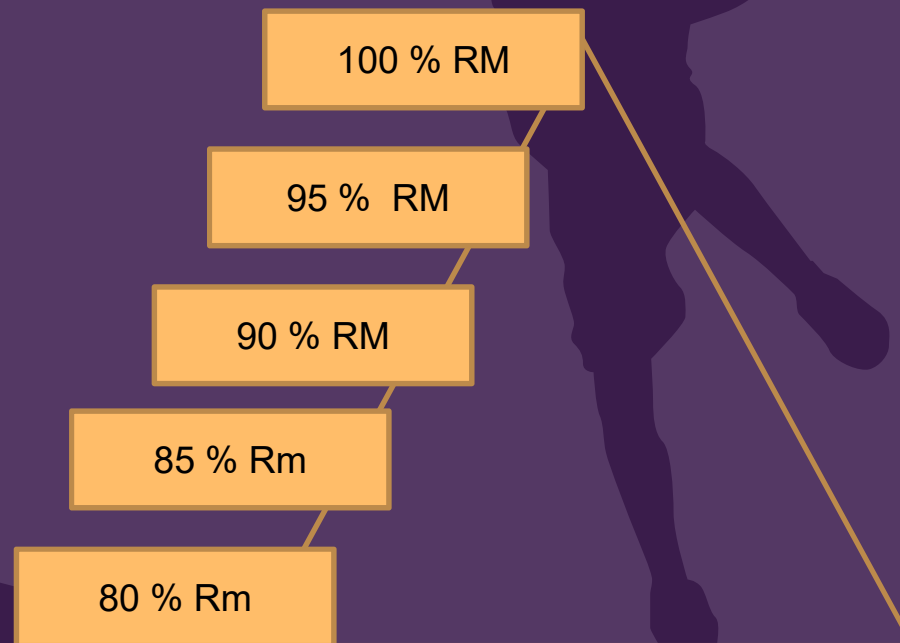


Maximum Strength Phase

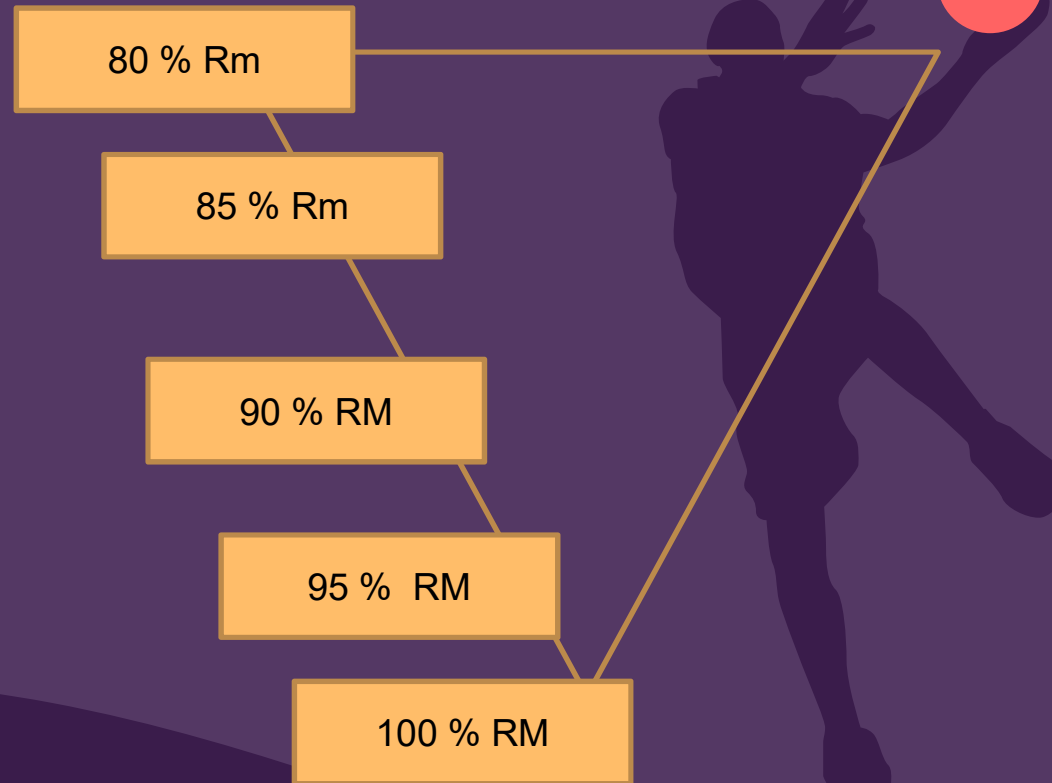
Pyramid Method (normal)

Meningkatkan kekuatan maksimal otot, ciri :

- Intensitas > 80% RM
- Set (4 – 8)
- Repetisi sedikit (6 – 1 x)
- Gerak kontraksi cepat
- Istirahat (1 – 3 menit)

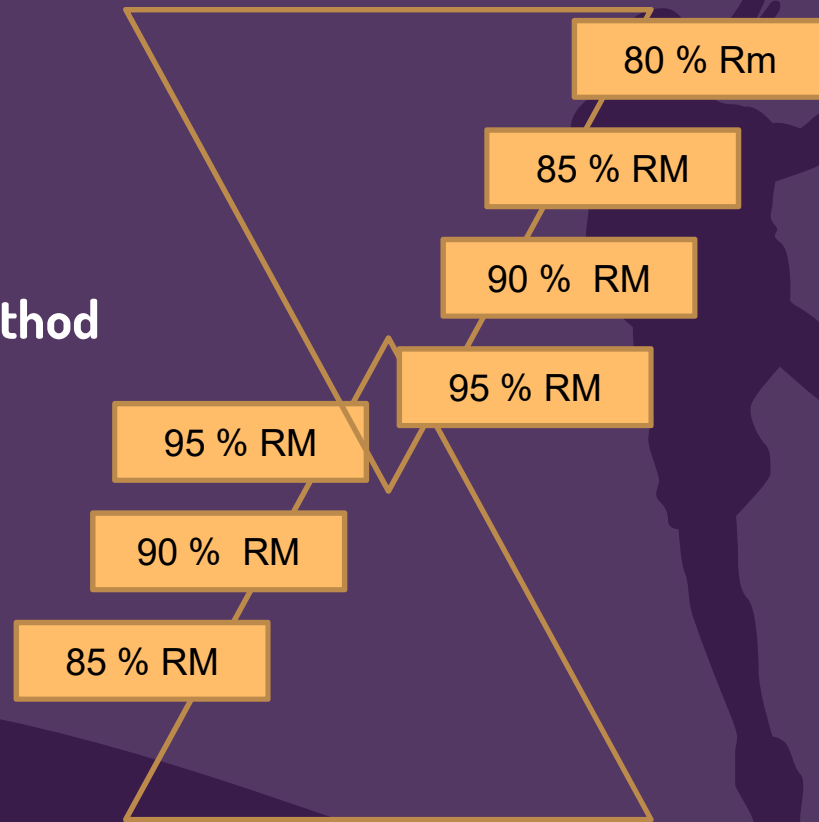


Maximum Strength Phase



Maximum Strength Phase

Double Pyramid Method



Mengubah

(Conversion)

4 – 8 minggu

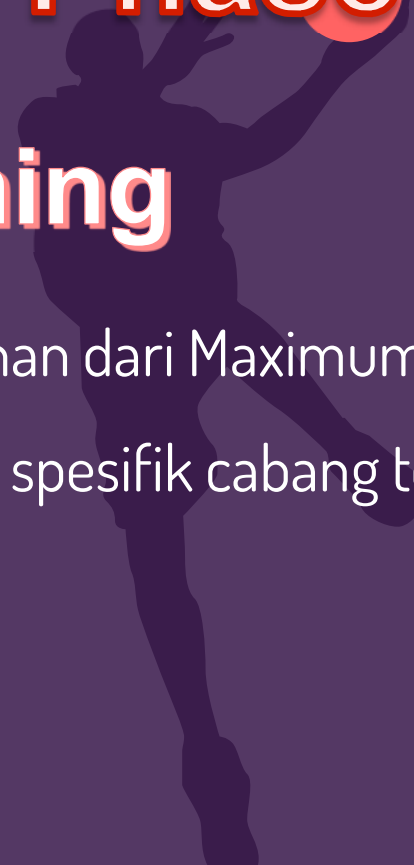


Conversion Phase

Power Training

Tahap ini merupakan tahap perubahan dari Maximum Strength ke Power atau yang mengarah ke spesifik cabang tertentu

(1 – 2 Bulan)



Contoh – 3 Week Power Training Program



Exercise	Week I	Week II	Week III
Jump Squat	60/8/3	70/6/4	70/8/4
Preacher Curls	70/8/3	70/8/3	70/10/3
Military Presses	60/6/3	60/8/3	70/8/3
V-Sits	3 X 15	3 X 15	4 X 15
Power Cleans	50/6/3	60/6/3	60/8/3

Power Endurance

A silhouette of a basketball player in mid-air, jumping to shoot a ball. The player is positioned on the right side of the slide, with their arms extended upwards and hands near a red basketball. The background is a dark purple gradient with a lighter purple arc on the left side.

kemampuan otot untuk Memperagakan kecepatan kontraksi yang tinggi dalam waktu yang relatif lama. Rebounding in basketball, Spiking in Volleyball, Jumping to head the ball in Soccer.

Conversion to Power Endurance

Training Parameter	Work
Load	50% - 70%
No of exercises	2 – 3
No of rep per sets	15 – 30
No of sets per session	2 – 4
Rest interval between set	5 – 7 menit
Speed of execution	Very dynamic
Frequency per week	2 - 3

Daya tahan Kekuatan (Strength Endurance)

A silhouette of a basketball player in a dynamic pose, holding a red basketball with both hands. The player is wearing a jersey and shorts, and is positioned on the right side of the slide, partially overlapping the title text.

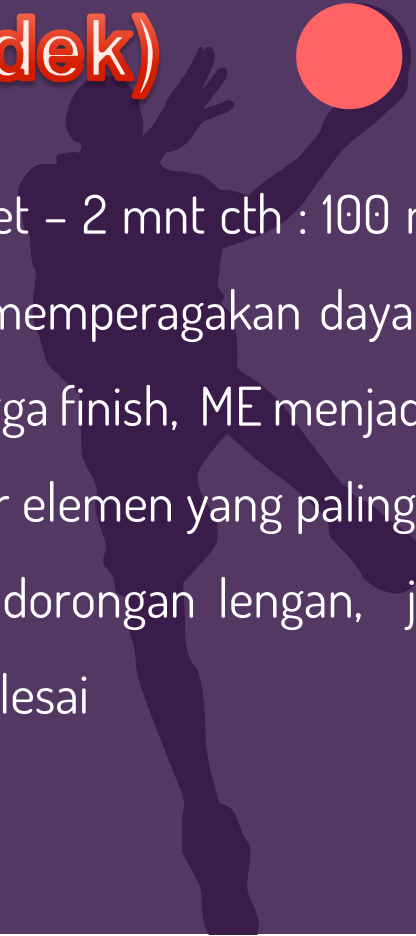
Kombinasi antara kekuatan dan daya tahan yakni kemampuan otot untuk mempertahankan atau mengatasi kelelahan disebabkan pembebanan kekuatan dalam waktu yang relatif lama. Oleh karena kekuatan membicarakan tentang kemampuan otot maka daya tahan kekuatan sering disebut daya tahan otot [muscular endurance].

Conversion to Strength Endurance

Training Parameter	Work
Load	50% - 60%
No of exercises	3 - 6
No of activity	30 - 60 sec
No of sets per session	3 - 6
Rest interval between set	60 - 90 sec
Speed of execution	Medium to fast
Frequency per week	2 - 3

M-E Short / Daya Tahan Otot (durasi pendek)

Untuk cabang olahraga yang berdurasi antara 40 det – 2 mnt cth : 100 m renang. Pada renang 100 m dimulai dengan start awal dengan memperagakan daya ledak pada 20 strokes pertama, dari pertengahan perlombaan hingga finish, ME menjadi sama pentingnya dengan power. Pada 30 – 40 m terakhir elemen yang paling penting adalah kemampuan dalam menduplikasikan tenaga dari dorongan lengan, jadi percepatan dapat dipertahankan dan lalu ditingkatkan hingga selesai



Conversion to Muscular Endurance

MUSCULAR ENDURANCE OF SHORT DURATION METHOD

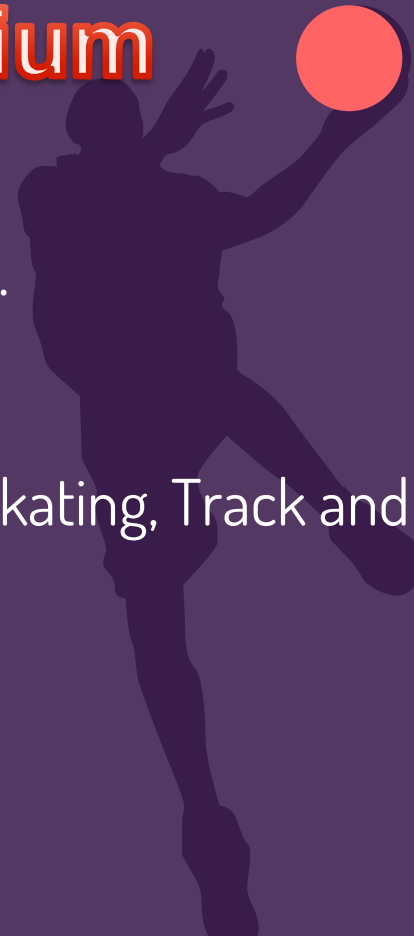
Training Parameters	Work
Load	50-60%
Number of Exercises	3-6
Number of Reps per Sets	30-60 sec
Number of Sets per Session	3-6
Rest Interval between Sets	60-90 sec
Speed of Execution	Medium to fast
Frequency per Week	2-3

M - E Medium

Merupakan ciri dari cabang olahraga siklis.

2 -5 menit long contoh :

200 - 400 m Swimming, 3000 m speed skating, Track and Field jarak menengah, 1000m kano dan lain - lain



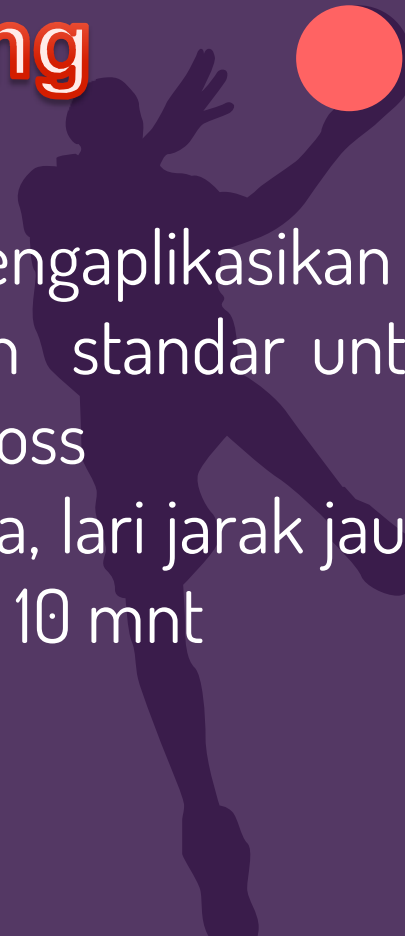
Conversion to Muscular Endurance

MUSCULAR ENDURANCE OF MEDIUM

Training Parameters	Work
Load	40-50 %
Number of Exercises	4-8
Number of Reps per Sets	2 min
Number of Sets per Session	2-4
Rest Interval between Sets	5 min
Speed of Execution	Medium.
Frequency per Week	2-3

M - E Long

Digunakan untuk kemampuan mengaplikasikan kekuatan untk melawan tahanan atau beban standar untuk jangka waktu yang lama seperti rowing, cross country ski, balap sepeda jalan raya, lari jarak jauh, renang, kano. Dengan durasi waktu lebih 6 – 10 mnt



Conversion to Muscular Endurance

MUSCULAR ENDURANCE OF LONG DURATION METHOD

Training Parameters	Work
Load	30-40 %
Number of Exercises	4-6
Number of Sets per Session	2-4
Number of Reps per Sets	> 2 min
Rest Interval between Sets	1-5 min each group
Speed of Execution	Medium
Frequency per Week	2-3

Plyometrics

A silhouette of a basketball player in mid-air, reaching up to catch a red ball. The player is positioned on the right side of the slide, with their arms extended upwards and one leg bent. The background is a dark purple gradient.

Plyometrics atau juga dikenal dengan istilah stretch shortening cycle myotatic stretch reflex, plyometrics mengacu pada latihan dimana pembebanan otot terjadi pada kontraksi eksentris , diikuti seketika dengan kontraksi konsentris.

Plio- lebih

Metrik- untuk mengukur

Plyometric- untuk meningkat/kan di (dalam) ukuran

Plyometrics

LATIHAN PLYOMETRIC DIBAGI DALAM 2 KELOMPOK UTAMA
BERDASARKAN TINGKAT IMPACT PADA SISTEM SYARAF PUSAT :

1. LOW IMPACT EXERCISE
2. HIGH IMPACT EXERCISE



LOW IMPACT EXERCISE

1. SKIPPING
2. ROPE JUMPS
3. JUMP WITH LOW AND SHORT STEPS, HOPS, AND JUMP.
4. JUMP OVER ROPE OR LOW BENCHES 25 – 30 CM (10 -15 INCHES)
5. THROW 2 – 4 KG (BALL MEDICINE)
6. TUBING
7. THROWING LIGHT IMPLEMENTS (BASEBALL)



HIGH IMPACT EXERCISE

A silhouette of a person in mid-air, jumping to catch a ball. The person is wearing a tank top and shorts. The ball is a reddish-orange color. The background is a dark purple gradient.

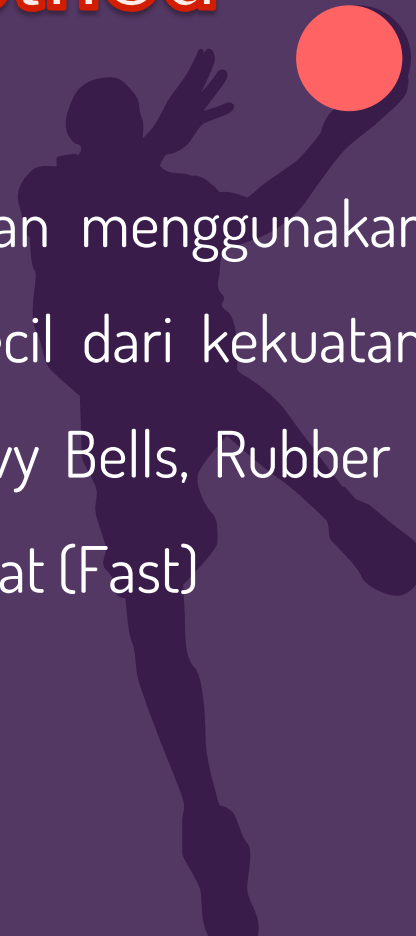
1. STANDING LONG AND TRIPLE JUMPS
2. JUMP WITH HIGHER AND LONGER STEPS, HOPS AND JUMPS
3. JUMP OVER ROPE OR HIGH BENCHES ≥ 35 CM (15 INCHES OR HIGHER)
4. THROW 5 – 6 KG (BALL MEDICINE)
5. TUBING
6. THROWING HEAVY IMPLEMENTS
7. DROP JUMP AND REACTIVE JUMP
8. SHOCK MUSCLE TENSION

Plyometrics Exercise

Plyometric Volume Per Session (100%)	
Experience	Ground Contacts
Beginner	80 – 100
Intermediate	100 - 120
Advanced	120 - 140

Ballistic Method

Adalah metode latihan power dengan menggunakan peralatan (equipment) yang beratnya lebih kecil dari kekuatan maksimal (Track and Field, Medicine Ball, Heavy Bells, Rubber Cords) dan semua gerakan dilakukan dengan cepat (Fast)



Contoh, Ballistic Method



Contoh, Ballistic Method



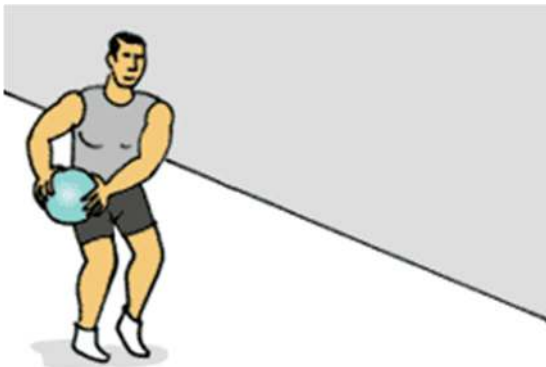
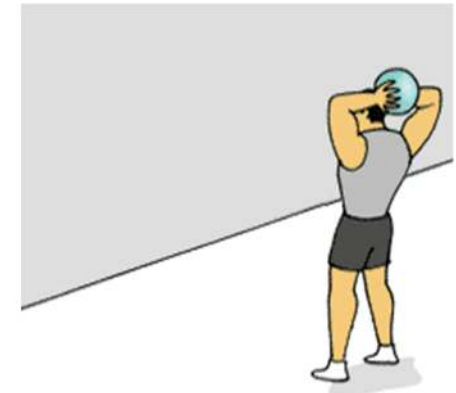
Training Parameters for the Ballistic Method

Training Parameters	Work
Load	Standard
Number of Exercises	2 – 5
Number of Repetitions Per Set	10 – 20
Number of Set Per Session	3 – 5
Rest Interval	2 – 3 minutes
Speed of Execution	Explosive
Frequency Per Week	2 - 4

Contoh, Ballistic Method Combined with Maximum Acceleration

Exercise	Week I	Week II	Week III
Medicine ball chest throws	2 X 10	3 X 12	3 X 15
Jump squat and medicine ball chest throws	2 X 8	3 X 10	3 X 15
Medicine ball overhead backward throws	2 X 10	2 X 15	3 X 15
Medicine Ball side throws (for each side)	2 X 12	3 X 15	3 X 20
Medicine ball forward overhead throws	2 X 10	3 X 10	3 X 12
Two hand shot throws from chest followed by 15 meter sprint	4 X	6 X	6 X
Push up followed by 15 meter sprint	4 X	6 X	8 X

Contoh, Ballistic Method Combined with Maximum Acceleration



Contoh, Ballistic Method Combined with Maximum Acceleration





Pemeliharaan (Maintenance)

8 – 16 minggu

Maintenance

A silhouette of a basketball player in a dynamic pose, holding a red ball with both hands. The player is positioned on the right side of the slide, partially overlapping the text area. The background is a dark purple gradient with a lighter purple arc on the left side.

Tujuan utama dari tahap ini adalah mempertahankan prestasi yang telah dicapai selama tahap sebelumnya, juga Program pada tahap ini adalah fungsi dari kekhususan kebutuhan dari cabang Olahraganya. Perbandingan pemberian antara kekuatan maksimal, daya ledak dan daya tahan otot harus mencerminkan kebutuhan kecabangan, fase ini berlangsung selama 2 - 4 bulan tergantung dari tingkatan prestasi atlitnya.

VARIASI PEMBEBANAN LATIHAN SELAMA TAHAP KOMPETISI

A silhouette of a basketball player in a dynamic pose, holding a red basketball with both hands. The player is positioned on the right side of the slide, partially overlapping the title text.

Program mempertahankan (mainenance) dapat diberikan walaupun pertandingan dilaksanakan seminggu 2 kali diberikan 1 - 2 set dengan 3 jenis latihan kekuatan tergantung dari kebutuhan cabang tersebut

Penghentian Latihan Kekuatan (Cessation / Unloading)

1 minggu



Cessation / Unloading Phase

A silhouette of a basketball player in mid-air, shooting a red ball. The player is positioned on the right side of the slide, with their arms extended upwards. The background is a dark purple gradient.

Program latihan kekuatan berakhir 5 – 7 hari sebelum pertandingan utama Program latihan kekuatan harus berakhir jadi atlet dapat menyimpan semua cadangan Tenaga / energi untuk penampilan terbaiknya. Untuk cabang olahraga yang mempunyai Karakteristik power tetap dipertahankan latihan power Maksimal 2 kali dalam minggu terakhir sebelum kompetisi.

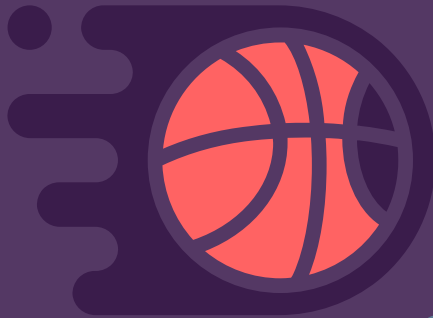
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- Periodization Training for Sports : Science-Based Strength and Conditioning Plans for 20 Sports, T.O Bompá and M.C. Carrera, 2005, 2nd ed. (Champaign, IL: Human Kinetics)

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