

Appendix B: Training Zone and Readiness Quick Reference

This appendix is a field reference for the Zone 0-7 system presented in Chapter 6 and for matching the intended training stress to the athlete's current readiness.

The system contains an active-recovery Zone 0 plus seven training zones. The boundaries are anchored to the athlete's tested aerobic threshold (AeT), anaerobic threshold (AnT), and metabolic profile. They are not generic percentages of maximum heart rate. The ranges below reproduce the worked example from Table 6.4; an athlete's own test results should replace the example values.

Training Zone Overview

Zone	Book name	HR anchors (worked example assumes 180 bpm max)	Example lactate	Primary physiological job
Zone 0	Active Recovery	Below about AeT-10 bpm; example below 120 bpm	Below 1.2 mmol/L	Restore the capacity to train; health-supporting movement
Zone 1	Easy Aerobic	About AeT-10 bpm to AeT; example 120-130 bpm	Below 1.2 mmol/L	Train slow-twitch fibers, fat oxidation, and cardiac remodeling
Zone 2	Steady Endurance	AeT to about AeT+10 bpm; example 130-140 bpm	About 1.2-1.6 mmol/L	Extend the oxidative range of fast-oxidative fibers
Zone 3	Moderate Aerobic	Example 140-148 bpm	About 1.6-3.0 mmol/L	Event-specific moderate work when the event requires it
Zone 4	Threshold	About AnT-10 bpm to AnT; example 148-158 bpm	About 3.0-4.0 mmol/L	Maximize aerobic output while keeping lactate in balance
Zone 5	Max VO2	AnT toward maximum; example 158-173 bpm	About 4.0-10.0 mmol/L	Raise maximal aerobic power and the aerobic ceiling
Zone 6	Lactate Tolerance/Production	Near maximum; example 163-173 bpm	Often above 10.0 mmol/L	Develop event-specific anaerobic power and capacity
Zone 7	Speed	Often about AeT+10 bpm to AnT in the worked example	Kept below about 4.0 mmol/L	Practice high-quality alactic speed and technique

Zone numbers describe the physiological purpose of the work, not a perfectly ascending heart-rate ladder. Zone 7 speed repetitions can be very fast while remaining low in metabolic cost because the repetitions are short and recovery is generous.

Zone 0: Active Recovery

Zone 0 is “sharpen the saw” work. It is not intended to add fitness directly; it restores the athlete's ability to return to useful training. Walking, nature time, yoga, light mobility, and movement distributed through the day belong here.

Use it for:

- Health restoration.
- Increasing total daily energy expenditure.
- Breaking up sedentary time.

- Recovery support.
- Building consistency in athletes who are returning from inactivity.

Coaching cue: If an athlete is sedentary outside training, adding Zone 0 may be more important than adding another workout.

Zone 1: Easy Aerobic Work

Zone 1 makes up the majority of training time for endurance athletes. It recruits and develops fat-oxidative Type I fibers and accumulates heartbeats near peak stroke volume without creating constant recovery debt.

Use it for:

- Aerobic base.
- Fat oxidation.
- Capillary and mitochondrial development.
- Recovery between harder sessions.
- Long-term durability.

Warning signs it is too hard:

- Conversation becomes strained.
- Heart rate drifts quickly.
- The athlete feels flat the next day.
- Easy days stop improving readiness.

Zone 2: Steady Aerobic Work

Zone 2 is the first tier of specific preparation for fast-oxidative fibers. It pushes the first lactate step down and broadens the athlete's fat-oxidation profile. Its usable width varies considerably with metabolic fitness.

Use it for:

- Extending aerobic power.
- Steady long intervals.
- Event-specific endurance for athletes who are ready for it.
- Bridges between easy base work and more specific intensity.

Common mistake: Athletes often do too much Zone 2 when they think they are doing easy training.

Zone 3: Moderate Aerobic

Zone 3 is the book's "no man's land." Glycogen use is disproportionately high while the intensity is not high enough to fully tax the oxidative limit of the fast-oxidative fibers. Unless the target event occurs in this zone, time here should be limited and deliberate.

Use it for:

- Event-specific preparation when race intensity falls here.
- Carefully prescribed moderate aerobic work.
- Bridging work when the athlete's tested metabolic profile supports it.

Readiness requirement: The athlete should be fueled, recovered, and emotionally ready to concentrate.

Zone 4: Threshold

Zone 4 trains the fast-oxidative fibers to produce energy aerobically while blood lactate remains near balance. It is central for events lasting roughly 90 seconds to 90 minutes and should be anchored to the athlete's AnT rather than a generic percentage.

Use it for:

- Threshold intervals and sustained work near AnT.
- Raising the fraction of VO₂max that can be sustained aerobically.
- Specific preparation for events dominated by threshold ability.

Warning signs:

- HRV and mood fall for several days.
- The athlete needs excessive motivation to complete the work.
- Easy days are no longer easy.
- Benchmark performance declines despite high effort.

Zone 5: Max VO₂

Zone 5 maximally challenges the ability of the recruited fibers to consume oxygen and produce aerobic energy. It raises the aerobic ceiling, but many developing athletes already have more ceiling than foundation and should first improve the lower zones.

Use it for:

- VO₂max intervals for events and athletes that require them.
- Raising maximal aerobic power after sufficient base and threshold development.
- Specific preparation for events shorter than about 30 minutes.

Rule: Add Zone 5 because the athlete's profile and event require a higher ceiling, not simply because hard work feels productive.

Zone 6: Lactate Tolerance/Production

Zone 6 develops the anaerobic power and capacity required when the event has a large glycolytic contribution. It is particularly relevant to events shorter than about three minutes, is highly event-specific, and can work against the goal of making fast-twitch fibers more oxidative.

Use it for:

- Lactate-production work for very short events.
- Lactate-tolerance work for approximately one- to three-minute demands.
- Short, precisely placed blocks close to relevant competition.

Rule: A little goes a long way. Do not prescribe this work to an endurance athlete without a clear event-specific reason.

Zone 7: Speed

Zone 7 is the athlete's ultimate speed ceiling: muscular size, strength, power, skill, and the ability to apply them quickly. The work is alactic and technique-led. It should be fast without necessarily being metabolically hard.

Use it for:

- Very short, high-quality speed repetitions.
- Neuromuscular recruitment and technical rehearsal.

- Maintaining basic speed throughout the year.
- Speed-assisted work where appropriate and safely supervised.

Rule: Stop while movement quality is high. Use short repetitions and generous recovery, and keep lactate below the second threshold rather than turning speed practice into Zone 6 fatigue.

Readiness Categories

Readiness state	Typical signals	Training choice
Load	Good sleep, stable or strong HRV trend, normal resting heart rate, low soreness, good mood, low life stress	Key session, loading day, or planned progression
Maintain	Mixed signals, normal fatigue, manageable soreness, stable mood, no major warning signs	Easy to moderate training, skill work, aerobic maintenance
Recover	Low HRV relative to normal, elevated or unusually low resting heart rate, high soreness, poor sleep, high stress, low mood, illness signs	Recovery day, Zone 0/1 only, mobility, fueling, sleep
Reassess	Conflicting signals or sudden unusual change	Delay key work, start easy, use warm-up as assessment, modify based on response

Readiness Is Specific

An athlete may be ready for easy aerobic work but not ready for intensity.

An athlete may be mentally motivated but physiologically under-recovered.

An athlete may have a high HRV number because recovery systems are active, not because the body is ready for more stress.

Ask: Ready for what?

Readiness Metrics Are Odds Adjusters

No single readiness metric is deterministic. HRV, resting heart rate, soreness, mood, sleep, and stress do not tell us with certainty what will happen in today's session. They adjust the odds.

For example, an athlete might report poor session feel on 20% of normal days. On low-HRV days, poor session feel might occur 30% of the time.

- Baseline risk: 20%
- Low-HRV risk: 30%
- Absolute increase: +10 percentage points
- Relative increase: $30 / 20 = 1.5x$ higher risk

This does not mean low HRV causes a bad workout. It means low HRV makes a bad workout more likely for that athlete, in that context. The same logic applies to injury risk, illness risk, or poor training response. A metric is not a verdict. It is an odds adjuster.

The coaching question is therefore not, "Is this metric good or bad?" but, "How much does this metric change the risk of the session I am about to prescribe?"

Morning Readiness Checklist

Before a key session, check:

- HRV compared with the athlete's own normal range.

- Resting heart rate compared with normal.
- Sleep duration and quality.
- Muscle soreness or heaviness.
- Mood and motivation.
- Life stress.
- Fueling status.
- Recent training load.
- Signs of illness.

If two or more major signals are clearly poor, the key session should be questioned.

Warm-Up Decision Rule

The warm-up is part of readiness assessment.

Proceed with the planned session when:

- Coordination improves during the warm-up.
- Heart rate response is normal.
- Breathing settles.
- The athlete feels better after 10-20 minutes.

Modify the session when:

- The athlete feels worse as the warm-up continues.
- Heart rate is unusually high or unusually suppressed.
- Power or pace feels unusually costly.
- Mechanics feel heavy, unstable, or painful.

Stop or switch to recovery when:

- Pain changes movement.
- Illness symptoms appear.
- Dizziness, chest pain, unusual breathlessness, or abnormal symptoms occur.

Matching Load to Readiness

If the plan says...	And readiness is high...	And readiness is mixed...	And readiness is low...
Recovery day	Keep it easy	Keep it easy	Keep it very easy or rest
Easy aerobic day	Complete as planned	Complete shorter/easier	Zone 0/1 only or rest
Maintenance day	Complete as planned	Reduce duration or remove intensity	Recovery day
Loading day	Complete as planned	Start easy and decide after warm-up	Move key work or replace with recovery
BIG day	Complete only if the athlete is clearly ready	Usually postpone or shorten	Do not force it

Common Readiness Mistakes

Do not treat one metric as the truth.

Do not use a green score to justify a session that does not fit the larger plan.

Do not use a red score to create panic. One poor morning can be noise.

Do not ignore life stress. It draws from the same adaptation reserve as training.

Do not confuse motivation with readiness.

Do not let technology replace the athlete conversation.

The Practical Rule

Training works when the athlete can repeat the right stress often enough to adapt.

Intensity is useful when it is absorbed.

Volume is useful when it is repeatable.

Recovery is useful when it restores the capacity to train.

The best zone for today is the one that supports the next useful adaptation.