With longer sports seasons and more competitions, high school and college coaches are searching for new in-season maintenance programs to enhance their programs. With time limitations and two to three competitions per week (i.e., basketball, volleyball, wrestling, etc.), careful consideration must be given to the delicate balance between skill (practice), rest (physical and mental) and training maintenance activities (2).

Stone suggests that “maintenance” and not “peaking” should be an in-season training objective for sports that have multiple competitions each week (4).

With proper manipulation of training variables, coaches are finding great success using circuit training (timed exercise) as an in-season training modality.

A few considerations must be made when designing a circuit program for in-season training:
1) What are the demands of the sport, i.e., basic gross motor movements in terms of strength and power?
2) What energy systems are used in terms of gross work capacity in the overall activity and local muscle endurance (i.e., tennis player, quarterback or baseball pitcher’s arm)?
3) How many competitions are scheduled in a given time period?
4) What are your specific objectives for in-season training, i.e., maintain functional strength, local muscle endurance, or energy system?

Circuit programming typically consists of a series of 8 to 12 exercises performed with short rest intervals. This work-to-rest ratio is usually 2:1 or 3:1. (For example, 20 seconds of exercise, followed by 10 seconds of rest). Repetitions during each exercise would be 10 to 15 or as many as resistance and work time will allow. Choice of exercise typically follows a largest to smallest muscle group pattern. (3)

To maximize the training effect in any parameter — strength, power, local muscle endurance, or overall energy system — exercise variables must be manipulated to achieve a specific goal.

An example of a circuit with improved upper body strength as a goal is shown in Table 1.

Remember, the correct resistance must be selected for the number of reps (intensity) to be effective. For example, athletes must strain to complete reps seven and eight.

Another example is an in-season circuit program for wrestling, in which lactic acid (limited strength, local muscle endurance) training is very important. Variable changes to develop

---

**Table 1. Typical strength oriented circuit for the upper body.**

<table>
<thead>
<tr>
<th>Station 1:</th>
<th>Station 2:</th>
<th>Station 3:</th>
<th>Station 4:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large muscle group (pusher) i.e., bench press/s incline, etc.</td>
<td>Large muscle group (puller) i.e., lat pull, seated row, etc.</td>
<td>Large muscle group (pusher) i.e., over-head press, dumbbell press, etc.</td>
<td>Large muscle group (puller) i.e., seated row dumbbell row, lat pull, etc.</td>
</tr>
<tr>
<td>6-8 reps (RM)</td>
<td>6-8 reps (RM)</td>
<td>6-8 reps (RM)</td>
<td>6-8 reps (RM)</td>
</tr>
</tbody>
</table>

**Table 2. Typical in-season wrestling circuit (after a skills oriented practice) row/lat pull, etc.**

<table>
<thead>
<tr>
<th>Station 1</th>
<th>Station 2</th>
<th>Station 3</th>
<th>Station 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper body - multi joint pulling exercise i.e., seated row/lat pull, etc.</td>
<td>Lower body - multi joint pulling exercise i.e., squat/ -sled/hack</td>
<td>Lower body - multi joint pulling exercise i.e., lat pull/ dumbbell row, etc.</td>
<td>Lower body - multi joint pulling exercise i.e., sled/ hack, etc.</td>
</tr>
<tr>
<td>-8-12 RM (20 sec.)</td>
<td>-8-12 RM (20 sec.)</td>
<td>-8-12 RM (20 sec.)</td>
<td>-8-12 RM (20 sec.)</td>
</tr>
<tr>
<td>-10 sec rest</td>
<td>-10 sec rest</td>
<td>-10 sec rest</td>
<td>-10 sec rest</td>
</tr>
<tr>
<td>repeat</td>
<td>repeat</td>
<td>repeat</td>
<td>repeat</td>
</tr>
</tbody>
</table>

**Note:** The number and selection. The limited number of exercises (volume) and the “work time” variable have been converted to reps (intensity), and approximately 1:1 work-to-rest ratio. This type of program is geared toward strength and minimizes lactic acid and oxygen components.
a circuit that trains lactic acid components would include: A double set for each exercise (set) with 2:1 work-to-rest ratios; intensity (reps) in the 8-12 RM range. (If you lift 8 reps try a 9th; if you get 9, try 10, etc. to create the repetition maximum (RM) phenomenon.)

This type of lifting will create a tremendous amount of lactic acid build-up of 130 mg/dl (2), which is a typical lactate level during actual wrestling competitions.

However, it is also important to note that this type of in-season programming should complement all practice and rest periods. For instance, the circuit should be planned on a day when the practice is skill oriented, rather than a "hard"

References