American College of Sports Medicine Guidelines

Diabetes Mellitus (Type 1)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Frequency, Intensity, Duration</th>
<th>Goals</th>
</tr>
</thead>
</table>
| **Aerobic:**  
  • Large muscle activities  
  • Avoid jarring activities if retinopathy/neuropathy is present  
  • Avoid exercise time with peak insulin activity | • 40-60% VO2 max if not neuropathy  
  • RPE 11-13  
  • 5-7 days/week or daily at low to moderate intensity  
  • 20-45 minutes/session (longer if low intensity)  
  • Avoid exercise time with peak insulin activity | • ↑ aerobic fitness  
  • ↓ CAD risk factors  
  • ↓ body weight and body fat  
  • ↓ decrease need for insulin & improve insulin sensitivity |
| **Strength:**  
  • circuit training  
  • interval training  
  • free weights | • 8-10 reps initially building to max of 20 reps  
  • 2-3 days/week  
  • Low weight | • ↑ ADL and gait, balance, coordination |
| **Flexibility:**  
  Stretching | • 2-3 days/week (before or after aerobic or strength training)  
  • Hold each stretch for 10-30 seconds | • Warm-up/cool down  
  • Prevention of injuries |

(ACSM’s Guidelines for Exercise Testing and Prescription)

*See exercise precautions on back*
Exercise Precautions for Type I and Type II Diabetes

- Postpone exercise if blood glucose > 300mg/dL or > 240 mg/dL
- Especially when beginning a program, monitor blood glucose before, during and after exercise if taking insulin or oral agents
- Adjustments in CHO (carbohydrate) intake and/or insulin may be needed before testing and training (30-60 min prior); ingest CHO if blood glucose is < 80 to 100
- Exercising in late evening may increase risk of nocturnal hypoglycemia

**Hypoglycemia** – too much insulin or increased absorption from injection site

**Steps to prevent/manage**
- Decrease insulin dosage or increase CHO intake (doctor approval for insulin dosage)
- Inject insulin into non-working tissue
- Avoid exercise during peak insulin activity
- Eat CHO before and during (if needed) long exercise bouts
- Carry a source of glucose
- Exercise with a partner – they can tell if something is wrong
- Know signs and symptoms of hypoglycemia
  - dizzy, shaky, headaches, confusion, irritable, sweaty, hungry, vision impairment

**Hyperglycemia** – too little insulin or ate too much

**Steps to prevent/or manage**
- Increase insulin dosage
- Exercise
- Decrease food intake
- Exercise with a partner so they can tell if something is wrong
- Know signs and symptoms
  - Hungry, vision impairment, thirsty, increased urination

*(ACSM’s Guidelines for Exercise Testing and Prescription)*
# American College of Sports Medicine Guidelines

## Diabetes Mellitus (Type 2)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Frequency, Intensity, Duration</th>
<th>Goals</th>
</tr>
</thead>
</table>
| **Aerobic:**  
  - Large muscle activities  
  - Non weight bearing or low impact activities  
  - Cross training to lessen chance for injury | **40-60% VO2 max if no neuropathy**  
  **RPE 11-13**  
  **5-7 days/week or daily (if on insulin) at low to moderate intensity**  
  **40-60 minutes/session (longer if low intensity)**  
  **Avoid exercise time with peak insulin activity** | **Maximize injury expenditure**  
  **↑ glucose control (HbA1c)**  
  **↑ aerobic fitness**  
  **↓ CAD risk factors**  
  **↓ body weight and body fat**  
  **↓ decrease need for insulin & improve insulin sensitivity** |
| **Strength:**  
  - circuit training  
  - interval training  
  - free weights | **8-10 reps initially building to max of 20 reps**  
  **2-3 days/week**  
  **Low weight** | **↑ ADL and gait, balance, coordination** |
| **Flexibility:**  
  Stretching | **2-3 days/week (before or after aerobic or strength training)**  
  **Hold each stretch for 10-30 seconds** | **Warm-up/cool down**  
  **Prevention of injuries** |

*(ACSM’s Guidelines for Exercise Testing and Prescription)*

*See exercise precautions on back*
Exercise Precautions for Type I and Type II Diabetes

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**Hypoglycemia** – too much insulin or increased absorption from injection site

**Steps to prevent/manage**
- Decrease insulin dosage or increase CHO intake (doctor approval for insulin dosage)
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- Avoid exercise during peak insulin activity
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- Carry a source of glucose
- Exercise with a partner – they can tell if something is wrong
- Know signs and symptoms of hypoglycemia
  - dizzy, shaky, headaches, confusion, irritable, sweaty, hungry, vision impairment

**Hyperglycemia** – too little insulin or ate too much

**Steps to prevent/or manage**
- Increase insulin dosage
- Exercise
- Decrease food intake
- Exercise with a partner so they can tell if something is wrong
- Know signs and symptoms
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*(ACSM’s Guidelines for Exercise Testing and Prescription)*
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</thead>
<tbody>
<tr>
<td><strong>Aerobic:</strong></td>
<td>• Variety of large muscle activities</td>
<td>• Improve caloric expenditure (700-2000 kcal/wk)</td>
</tr>
<tr>
<td></td>
<td>• 40-70% max aerobic capacity (lower intensities just as useful)</td>
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<tr>
<td></td>
<td>• RPE 11 to 14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 3-7 days/wk</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 30-60 minutes/session</td>
<td></td>
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<tr>
<td><strong>Strength:</strong></td>
<td>• 2-3 reps initially (if severe) building to 10-12 reps</td>
<td>• Increase % maximal voluntary</td>
</tr>
<tr>
<td></td>
<td>• 2-3 days week</td>
<td>contraction, peak torque or power</td>
</tr>
<tr>
<td></td>
<td>• low weight</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• resistance training should involve lower resistance with higher reps</td>
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</tr>
<tr>
<td><strong>Flexibility:</strong></td>
<td>• daily as warm-up and cool-down</td>
<td>• increase/maintain ROM</td>
</tr>
<tr>
<td>Stretching</td>
<td></td>
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(ACSM’s Guidelines for Exercise Testing and Prescription)

*See back for exercise precautions
Exercise Precautions for Type I and Type II Diabetes

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Hypoglycemia – too much insulin or increased absorption from injection site

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• Exercise with a partner – they can tell if something is wrong
• Know signs and symptoms of hypoglycemia
  ◦ dizzy, shaky, headaches, confusion, irritable, sweaty, hungry, vision impairment

Hyperglycemia – too little insulin or ate too much

Steps to prevent/or manage
• Increase insulin dosage
• Exercise
• Decrease food intake
• Exercise with a partner so they can tell if something is wrong
• Know signs and symptoms
  ◦ Hungry, vision impairment, thirsty, increased urination

(ACSM’s Guidelines for Exercise Testing and Prescription)
# Stroke Recovery

<table>
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</table>
| **Aerobic:** | • Large-muscle activities  
• (e.g., walking, treadmill, stationary cycle, combined arm-leg ergometry, arm ergometry, seated stepper) | • Increase independence in activities of daily living (ADLs)  
• Increase walking speed/efficiency  
• Improve tolerance for prolonged physical activity  
• Reduce risk of cardiovascular disease |
|            | • 3-7 days/week  
• 40%-70% peak oxygen uptake  
• 40%-70% heart rate reserve; 50%-80% maximal heart rate  
• rating of perceived exertion (RPE) 11-14 (6-20 scale)  
• 20-60 min/session (or multiple 10-min sessions) | |
| **Strength:** |  
• Weight machines  
• Circuit training  
• Free weights  
• Isometric exercise | • Increase independence in ADLs |
|            | • 1-3 sets of 10-15 repetitions of 8-10 exercises involving the major muscle groups  
• 2-3 days/week | |
| **Flexibility:** |  
Stretching  
• Daily as warm-up/cool down  
• Hold each stretch for 10-30 seconds | • Increase range of motion (ROM) of involved extremities  
• Prevent injuries |
| **Neuromuscular:** |  
Coordination and balance activities  
• Improve level of safety during ADLs | • 2-3 days/week (consider performing on same day as strength activities) |
American College of Sports Medicine Guidelines

**PTCA/Stents**

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<tbody>
<tr>
<td><strong>Aerobic:</strong></td>
<td>• Variety of large muscle aerobic activities</td>
<td>• ↑ ischemic threshold (ability to do more work before ischemic level of HR and BP are reached</td>
</tr>
<tr>
<td></td>
<td>• 3-7 days/week</td>
<td>• Aerobic capacity</td>
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<tr>
<td></td>
<td>• 40-85% max aerobic capacity if had GXT; HR 30 beats above rest if no GXT</td>
<td>• ↓ myocardial oxygen demand</td>
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<tr>
<td></td>
<td>• RPE 11-13</td>
<td>• ↑ quality of life</td>
</tr>
<tr>
<td></td>
<td>• 20-60 minutes/session (5-10 min warm-up/cool down)</td>
<td>• ↓ CAD risk factors</td>
</tr>
<tr>
<td><strong>Strength:</strong></td>
<td>• 8-10 reps initially building to max of 20 reps</td>
<td>• Increase % MVC (maximal voluntary contraction), peak torque, or power</td>
</tr>
<tr>
<td></td>
<td>• 2-3 days/week</td>
<td></td>
</tr>
<tr>
<td></td>
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<td>• Hold each stretch for 10-30 seconds</td>
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**General Guidelines**

- Progress gradually, increase workload every 1-3 weeks (if beginner)
- Increase intensity only after desirable endurance level is reached 20-30 min of continuous activity
- Consider short bouts of low intensity exercise with rest breaks

*(ACSM’s Guidelines for Exercise Testing and Prescription)*