

## ***CARDIOVASCULAR MONITORING GUIDELINES***

As a member service, the Acute Care Section offers these cardiovascular monitoring guidelines for use in a variety of clinical settings.

### ***Monitoring After Cardiovascular Surgery***

The physician should be contacted if the patient experience one or more of these symptoms:

- Sudden shortness of breath
- Palpitations (> 6/min)
- Increased swelling in feet and/or ankles
- Chest pain unrelated to the chest incision
- Fever > 100 degrees F
- Persistent drainage or change in drainage from any incision
- Increased welling, tenderness, and redness around any incisional area
- Dizziness
- Change in Pulse > 20 bpm (unrelated to activity)
- Extreme tiredness or weakness
- Weight gain of 3 lb/day for 23 days
- No Improvement in client condition

### ***Indications for Discontinuing or Modifying Activity***

- Pallor, peripheral cyanosis; cold, moist skin
- Staggering gait, ataxia
- Confusion or blank stare in response to inquiries
- Resting heart rate > 130 bmp, < 40 bmp
- More than 6 arrhythmias (irregular heart beats) per hour
- Uncontrolled diabetes mellitus (BS > 250 mg/dL)
- Oxygen sat < 85%
- Acute infection or fever > 100 degrees F
- Inability to converse during activity
- fall in SBP with increased activity (10 mmHg or more)
- rise in SBP > 250 mmHG or diastolic pressure > 120 mmHg
- Patient's request

# *Monitoring Vital Signs*

## *Heart Rate*

- Differentiate Heart Rate from Pulse Rate (60 - 100 bpm)
- Pulse force measurement:
  - 3+ = Full, bounding (indicates an increased stroke volume - could be associated with anxiety, exercise or a pathology)
  - 2+ = Normal
  - 1+ = Weak, thready (indicates decreased stroke volume)
- Factors Affecting HR
  - Aging - decreased maximum effective and target heart rates
  - Anemia - increased
  - Autonomic dysfunction (diabetes, SCI)
  - Caffeine
  - Cardiac muscle dysfunction - increased HR secondary to decreased SV
  - Deconditioning
  - Dehydration - increased HR secondary to decreased plasma volume
  - Drugs - especially beta blockers
  - Fear, pain, infection etc.
- Maximal Effective Heart Rate vs. Target Heart Rate
  - MEHR = the highest heart rate at which cardiac output can be maintained.
    - "Guestimation" of MEHR:  $220 - \text{age}$ ; for older healthy adult:  $205 - \frac{1}{2} \text{ age}$
  - Target Heart Rate - desired heart rate during training
    - "Guestimation" of Target HR: Modified Karvonen Formula:  
 $[(220 - \text{age}) - \text{Resting HR}] \times .5 - .7$  then add Resting HR back in.

## *Blood Pressure*

	<u>Systolic</u>	<u>Diastolic</u>
Normal	< 130	< 85
High Normal	130-139	85-89
Stage 1	140-159	90-99
Stage 2	160-179	100-109
Stage 3	180-209	110-119
Stage 4	> 210	> 120

### Abnormal BP Response:

- Too rapid a rise in systolic BP (will rise faster in men than in women)
- Little or no change in SBP
- Progressive rise in DBP: a rise of 20 mmHg or more → patient has exceeded cardiac reserve capacity and blood flow to the liver, kidney, and GI tract is greatly reduced
- Drop of > 10 mm HG in DBP: rapid vasodilation
- Drop in SBP or both SBP and DBP of 10 to 20 mmHg or more associated with an increase in pulse rate of > 15 beats/min: indicates depleted intravascular reserve
- Normal Response:
- SBP: 7-10 mmHg per MET of activity. For submaximal activity - up to 20-30 mmHg rise over resting without symptoms
- DBP: little or no change. May see a slight decrease in DBP secondary to peripheral vasodilation

### *Pulse Oximetry*

- Measures oxygen saturation
- Normal = 98% or greater
- A significant drop may indicate that an activity's VO<sub>2</sub> is too high or that cardiopulmonary function is inadequate to meet the demand
- Monitor before, during and after
- Can be used to demonstrate the efficacy of supplemental oxygen as well as breathing exercises and retraining.
- Any decrease of 3% to 5% on pulse oximetry should be noted. If < 85 - should request supplemental oxygen or an increase in oxygen already in use.

***Borg Scale of Perceived Exertion***

Numerical Rating

Verbal Rating

6

7

Very, very light

8

9

Very light

10

11

Fairly light

12

13

Somewhat hard

14

15

Hard

16

17

Very hard

18

19

Very, very hard

20