**Inhalation**

- **Exhalation**

- **(spontaneous breathing)**

- **a wave**: atrial contraction

- **c wave**: tricuspid valve closure

- **v wave**: venous return causes right atrial filling (occurs during ventricular systole)

- **x descent**: atrial relaxation

- **y descent**: tricuspid valve opens with right atrial emptying

**Right Atrium**

- **RA a wave**: PR interval
- **RA v wave**: end T wave

**Exhalation (spontaneous breathing)**

**Inhalation**
Exhalation (spontaneous breathing)

Inhalation

atrial kick and end diastole

ventricular filling

rapid ejection

reduced ejection

isovolumic relaxation

isovolumic contraction
Exhalation (spontaneous breathing)

- **Inhalation**: Pulmonary artery
  - Reduced ejection
  - Dicrotic notch: Pulmonic valve closure
  - Diastole
  - Start of systole: Pulmonic valve opens, with rapid ejection
Exhalation (spontaneous breathing)

Inhalation

**a wave:** atrial contraction

(c wave rarely seen in PCW tracing)

**v wave:** pulmonary venous return causes left atrial filling during ventricular systole (mitral regurgitation can also contribute)

**x descent:** atrial relaxation

**y descent:** mitral valve opens with left atrial emptying

**PCW a wave:** QRS

**PCW v wave:** after T wave

Note: ECG to waveform delay more than with RA tracing
1. atrial contraction
2. isovolumic contraction
3. rapid ventricular ejection
4. reduced ventricular ejection
5. isovolumic relaxation
6. rapid ventricular filling
7. slow ventricular filling

pulmonic valve opens
tricuspid valve closes
pulmonic valve closes
tricuspid valve opens

1. right atrium
2. right ventricle
3. pulmonary artery
4. slow ventricular filling

pulmonic valve closes
tricuspid valve closes