Abnormal arterial line waveforms

Pathological arterial line waveforms

**Atherosclerosis and hypertension**
- Steep sharp systolic peak
- Reflected waves are visible

In the atherosclerotic elderly the vessels have poor compliance, and the reflection wave returns early, before the aortic valve closes. Thus, it contributes to afterload. You can sometimes see it on the arterial line trace. This contribution disappears in vasodilation, and appears with vasoconstriction. The non-compliant vessels do not stretch in response to the systolic pressure, and thus the pressure rises rapidly at the beginning of systole.

**Aortic stenosis**
- Slurred gradual systolic peak

In presence of resistance to outflow, the systolic peak will be slow to arrive (as the left ventricle struggles to squeeze blood past the aortic valve). The dicrotic limb should remain relatively normal.

**Aortic regurgitation**
- Abnormally widened pulse pressure

The diastolic will be well below the systolic, with abnormally widened pulse pressure, because the blood regurgitates easily back into the left ventricle as it fills. The compliance of the left ventricle causes the arterial pressure to dip in diastole as some of the pressure is absorbed by the act of left ventricular filling.