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British and Irish Hypertension Society
Committed to preventing cardiovascular disease

Answers to Blood Pressure Auscultation Tutorials

These recordings were made using a mercury sphygmomanometer – the gold standard for blood pressure measurement. Beware that when using a mercury column, the observer must avoid parallax by having their eyes at the level of the meniscus. The precise interpretation of readings may be affected by auditory acuity and stethoscope or speaker quality.

Recording	Tutorial No.	Blood Pressure (mmHg)	Comments
1	T1	170/120	Phase 1 is clearly heard at 170mmHg and auscultatory sounds continue until 120mmHg. This patient is in sinus rhythm. It is important to remember that the cuff pressure should be reduced at a rate of 2-3mmHg per second or per pulse beat. This cuff has been released too quickly.
2	T2	194/96	The subject is in sinus rhythm. The systolic blood pressure is recorded where repetitive, clear, tapping sounds first appear for at least two consecutive beats. Therefore, occasional sounds above this level can be ignored.
3	T3	132/84	The subject is in sinus rhythm. Although a few sounds are audible above 132mmHg, regular tapping sounds are not heard above this value.
4	T4	218/116	The subject is in sinus rhythm.
5	T5	178/126	The subject is in atrial fibrillation. This column demonstrates the difficulties of estimating blood pressure in arrhythmias. In atrial fibrillation, stroke volume and hence blood pressure vary depending on the preceding pulse interval. Thus, blood pressure will be a rough estimate which can perhaps be improved upon only by repeated measurements.
6	T6	170/120	This falling column is a repeat of column 1. Did you record the same systolic and diastolic pressures?
7	T7	178/98-100	This patient is in sinus rhythm. Phase 1 is heard at 178mmHg and clear sounds continue until approximately 100mmHg.
8	T8	182/120	The subject is in atrial fibrillation. This column demonstrates the difficulties of estimating blood pressure in arrhythmias. In atrial fibrillation, stroke volume and hence blood pressure vary depending on the preceding pulse interval. Thus blood pressure will be a rough estimate which can perhaps be improved upon only by repeated measurements.
9	T10	140/88	Some irregular sounds are audible above 140mmHg. As they are neither clear nor repetitive, they can be ignored. Regular tapping sounds are heard from approximately 140mmHg and disappear at approximately 88mmHg. This patient has a sinus bradycardia (possibly caused by therapy with a beta-blocker)
10	T11	104/86	The subject is in sinus rhythm
11	T12	150/84	The subject is in sinus rhythm. The systolic blood pressure is recorded where repetitive, clear, tapping sounds first appear for at least two consecutive beats. Therefore, occasional sounds above this level can be ignored.
12	T14	132/86	The subject is in sinus rhythm.

13	T15	250/108	This blood pressure measurement has sounds which are clear and easy to hear. A few additional non-repetitive sounds are audible below 108mmHg.
14	T16	146/112	The subject is in sinus rhythm.
15	T17	134/86	The subject is in sinus rhythm.
16	T18	160/98-100	Although a few non-repetitive sounds are heard above 160mmHg, these are not significant. This patient is in sinus rhythm with a few ectopic beats.
17	T19	111/76	The subject is in sinus rhythm.
18	T20	120/88	The subject is in atrial fibrillation. This column demonstrates the difficulties of estimating blood pressure in arrhythmias. In atrial fibrillation, stroke volume and hence blood pressure vary depending on the preceding pulse interval. Thus blood pressure will be a rough estimate which can perhaps be improved upon only by repeated measurements. Artefacts above 120mmHg are noted.
19	T22	126/90-92	The subject is in atrial fibrillation. This column demonstrates the difficulties of estimating blood pressure in arrhythmias. In atrial fibrillation, stroke volume and hence blood pressure vary depending on the preceding pulse interval. Thus blood pressure will be a rough estimate which can perhaps be improved upon only by repeated measurements.
20	T23	194/106	The subject is in sinus rhythm.
21	T24	198/116	The subject is in sinus rhythm.
22	T25	120/84	The subject is in sinus rhythm.
23	T26	182/128-130	The subject is in atrial fibrillation. This column demonstrates the difficulties of estimating blood pressure in arrhythmias. In atrial fibrillation, stroke volume and hence blood pressure vary depending on the preceding pulse interval. Thus blood pressure will be a rough estimate which can perhaps be improved upon only by repeated measurements. Columns 5, 8 and 26 are from the same individual, on a different occasion, illustrating the difficulty in accurately recording blood pressure in patients with arrhythmias and demonstrating why repeated measurements may be useful.
24	T27	210/136	This patient has a sinus tachycardia.
25	T30	148/88	As the additional sounds audible before 148mmHg are irregular they can be disregarded.
26	T31	210/130	This falling column is a repeat of column 27. Did you record the same systolic and diastolic pressures?
27	T32	192/114-116	Sounds become muffled at approximately 146mmHg. This patient is in sinus rhythm.
28	T33	214/90	This is a good example of hypertension.
29	T34	108/72	The subject is in sinus rhythm and appears to have a relative bradycardia.