Blood Pressure and Blood Group

Experiment 8 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

1. Pulse Rate Heart Rate and Blood Pressure

Aim

To measure a supervised resting pulse and blood pressure and distinguish pulse rate from heart rate.

Principle

Pulse is the palpable arterial pressure wave; heart rate is the number of cardiac cycles per minute. They are usually equal in a regular effective rhythm but may differ. Blood pressure measurement depends on preparation, cuff size, arm position and repeated readings; one classroom reading does not diagnose hypertension.

Requirements

- Timer, validated upper-arm BP device and suitable cuff sizes.
- Stethoscope for the instructor-prescribed auscultatory demonstration.
- Consenting adult volunteer under classroom supervision or simulation.

Procedure

1. Prepare

Explain the activity and obtain consent. For a resting BP measurement, avoid exercise, smoking and caffeine for 30 minutes beforehand when following the standard procedure; allow at least five minutes of quiet seated rest.

2. Position

Seat with back supported, feet flat and legs uncrossed. Support the bare upper arm at heart level. Select the cuff specified for the measured arm circumference.

3. Measure pulse

Palpate the radial pulse with finger pads, not the thumb. Record rate and rhythm. Count for a full minute when irregular or when the protocol requires it.

4. Measure BP

Use the validated device instructions. Keep the volunteer still and silent. Repeat readings with the prescribed interval, commonly at least one minute, and record each result.

5. Observe auscultation

Where demonstrated, the first Korotkoff sounds identify systolic pressure and disappearance identifies adult diastolic pressure under the prescribed method.

6. Record and interpret

Record arm, cuff, position, device and readings. Do not change a person's treatment on the basis of the exercise.

Observations and Record

Measurement	Reading 1	Reading 2
Pulse / heart rate	____ beats/min	____ beats/min
Blood pressure	____ / ____ mmHg	____ / ____ mmHg
Arm / cuff / position	_____	_____

Worked Example

The numbers below are illustrative; enter your own observations in the record.

- Regular pulse exercise: 36 beats in 30 s gives 36 × 2 = 72 beats/min. Use a full-minute count when required rather than extrapolating an irregular rhythm.
- Fictional BP readings: 124/78 and 122/80 mmHg. Arithmetic mean = 123/79 mmHg.
- An auscultated heart rate of 84/min with a radial pulse of 78/min gives a pulse deficit of 6/min, if counted under an appropriate comparable protocol.

Result

Pulse: ____ beats/min; rhythm: ____. BP readings: ____ and ____ mmHg. Device, cuff, arm and position are documented.

Precautions

- Use a cuff that fits the arm; an unsuitable cuff can bias the result.
- Do not measure over clothing or while the person talks.
- Concerning symptoms during a volunteer activity require the supervising clinician's attention.

Viva Questions and Answers

1. Why support the arm at heart level?

It helps standardise hydrostatic effects on the reading.

2. Why can pulse and heart rates differ?

Some cardiac cycles may not generate a palpable peripheral pulse.

3. Does one high reading establish hypertension?

No; correct repeated assessment and clinical evaluation are required.

2. Blood Group Determination

Aim

To interpret a supervised ABO and RhD grouping demonstration using reagent reactions and controls.

Principle

In forward grouping, specific antibodies detect red-cell antigens through agglutination. Reverse ABO grouping checks plasma reactions with known reagent cells when applicable. RhD testing uses the specified anti-D method and controls. Classroom grouping is not a substitute for a transfusion laboratory work-up.

Requirements

- Instructor-prepared simulated grouping kit or authorised laboratory demonstration.
- Anti-A, anti-B and anti-D reagents, relevant controls and approved method instructions.
- Labelled reaction record; no unsupervised blood collection.

Procedure

1. Confirm identification

Check the demonstration material and reagent identity, expiry and quality-control status.

2. Set up reactions

The instructor follows the validated slide, tube or other method. Maintain separate reaction areas and avoid reagent carryover.

3. Read within the method

Record agglutination only within the specified time and conditions. Distinguish a true reaction from drying artefact or an invalid control.

4. Interpret forward ABO

Use the pattern in the table. Confirm that controls and any required reverse grouping agree; unresolved discrepancies need laboratory investigation.

5. Interpret RhD

A valid anti-D reaction supports D antigen detection under the method. A non-reactive result is interpreted by the laboratory's algorithm; do not invent a weak-D conclusion.

6. Record limitations

State that clinical transfusion decisions require authorised testing, compatibility assessment and the complete patient context.

Forward ABO Pattern

Anti-A	Anti-B	Forward ABO interpretation
+	–	A
–	+	B
+	+	AB
–	–	O

Reverse Grouping Check

In a suitable adult demonstration, group A plasma reacts with B reagent cells, group B plasma with A reagent cells, group O plasma with both, and group AB plasma with neither. Special age groups and discrepant reactions require the laboratory's procedure.

Observations and Record

Reagent	Reaction + / –	Control status
Anti-A	____	_____
Anti-B	____	_____
Anti-D	____	_____

Worked Example

The numbers below are illustrative; enter your own observations in the record.

- Fictional valid forward grouping: anti-A positive, anti-B negative. The forward ABO pattern supports group A.
- If anti-D is positive with a valid control, the teaching interpretation is RhD positive.
- If a control is invalid or forward and reverse ABO results disagree, record "unresolved" rather than assigning a definitive group.

Result

Forward ABO pattern: ____. Control validity: ____. Teaching ABO / RhD interpretation: ____ / ____, subject to the complete laboratory method.

Precautions

- Do not use a classroom or home grouping result for transfusion or pregnancy care.
- Read at the specified time; dried mixtures may mimic agglutination.
- Do not assume ABO and RhD cover every clinically relevant blood-group antigen.

Viva Questions and Answers

1. What does anti-A detect?

A antigen on red cells in a valid forward-grouping test.

2. Why use reverse ABO grouping?

It provides a complementary plasma-reaction check when appropriate.

3. Does group matching alone prove transfusion compatibility?

No; other antigens and antibodies and compatibility procedures matter.

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