Exercise walk-through

7.5 Hypersensitivity

University Medicine

Hypersensitivity: four clocks

1. **I** IgE + mast cells, minutes: allergy, anaphylaxis - adrenaline IM is the decision.
2. **II/III** IgG on cells (hours: transfusion, haemolysis); immune complexes (days: serum sickness, nephritis).
3. **IV** T cells, 48–72 h: contact dermatitis, TB skin test - antihistamines useless, steroids work.

Hypersensitivity - figure

the clock names the mechanism

I — immediate	IgE + mast cells	minutes	anaphylaxis
II — cytotoxic	IgG on cells	hours	haemolysis
III — complexes	immune complex deposit	days	serum sickness
IV — delayed	T cells	48–72 h	contact dermatitis

Four types compared with clocks and examples.

Exercises 2.1·2.3

2.1 Which type is a tuberculin skin test? [3]

2.2 Which antibody class drives type I? [3]

2.3 Serum sickness is which type, and why days? [3]

Exercises 2.1·2.3

2.1 Which type is a tuberculin skin test? [3]

2.1

- Type IV.

2.2 Which antibody class drives type I? [3]

2.2

- IgE ✓.

2.3 Serum sickness is which type, and why days? [3]

2.3

- Type III: antibody must first form, then complexes must deposit – an assembly lag of days ✓.

Exercise 3.1

3.1 A patient develops fever, rash and arthralgia 8 days after receiving a foreign serum (fictional).

Classify the reaction (III) and explain the days-scale (complexes form as antibody appears, then deposit). Predict the complement findings. State the treatment principle. [7]

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3.1

- Type III: antibody–antigen complexes deposit in vessels, joints and kidneys.
- Days: the immune response to the serum must mature first; then complexes form and deposit ✓. Complement consumed → low C3/C4.
- Stop exposure, supportive care ± steroids/antihistamines for symptoms.

Exercise 3.2

3.2 A transfusion of A-positive blood to an O-positive recipient (fictional).

Explain the mechanism (pre-formed anti-A IgM → type II, immediate intravascular haemolysis). Predict the timeline and the urine/serum findings. Contrast with a delayed haemolytic reaction. [7]

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3.2

- Pre-formed anti-A (naturally occurring IgM) binds the transfused cells → complement lysis: type II, minutes–hours.
- Immediate fever, loin pain, haemoglobinuria, low haptoglobin ✓.
- Delayed (days–weeks): anamnestic IgG to minor antigens – extravascular clearance, falling haemoglobin.