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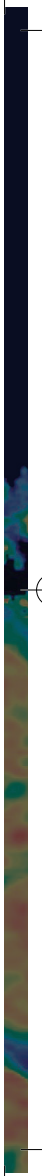

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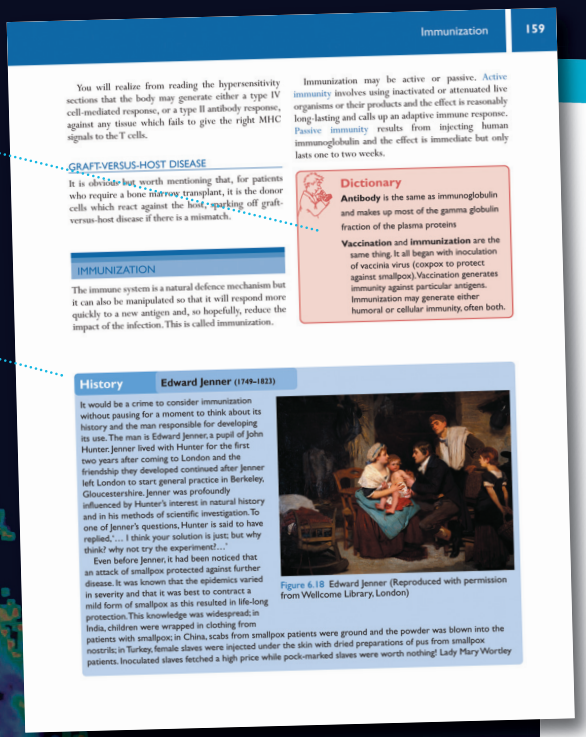
Dictionary Boxes – Define important pathological terms

History Boxes – put key figures and events in context

Key facts – ideal for quick reference

Cartoons – make the subject-matter more memorable



Immunization 159

You will realize from reading the hypersensitivity sections that the body may generate either a type IV cell-mediated response, or a type II antibody response, against any tissue which fails to give the right MHC signals to the T cells.

GRAFT-VERSUS-HOST DISEASE

It is obviously worth mentioning that, for patients who require a bone marrow transplant, it is the donor cells which react against the host, sparking off graft-versus-host disease if there is a mismatch.

IMMUNIZATION

The immune system is a natural defence mechanism but it can also be manipulated so that it will respond more quickly to a new antigen and, so hopefully, reduce the impact of the infection. This is called immunization.

Immunization may be active or passive. Active immunity involves using inactivated or attenuated live organisms or their products and the effect is reasonably long-lasting and calls up an adaptive immune response. Passive immunity results from injecting human immunoglobulin and the effect is immediate but only lasts one to two weeks.

Dictionary

Antibody is the same as immunoglobulin and makes up most of the gamma globulin fraction of the plasma proteins

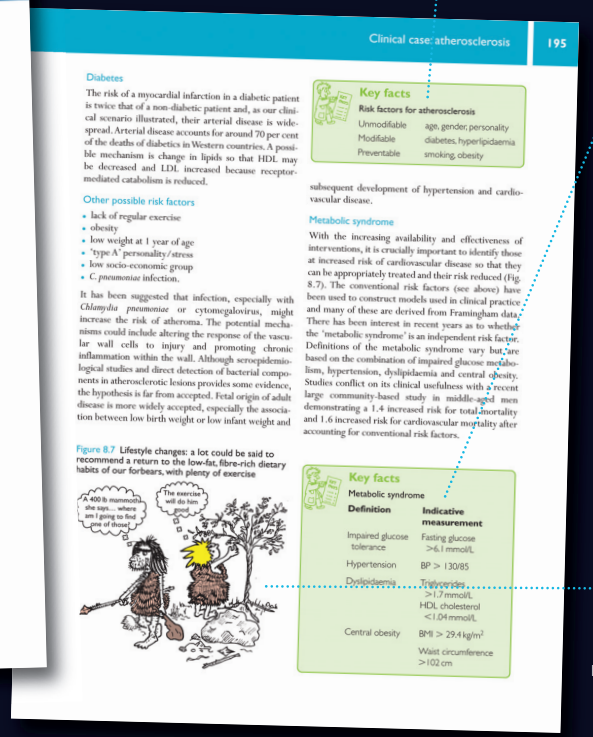
Vaccination and **immunization** are the same thing. It all began with inoculation of vaccinia virus (coxpox to protect against smallpox). Vaccination generates immunity against particular antigens. Immunization may generate either humoral or cellular immunity, often both.

History Edward Jenner (1749–1823)

It would be a crime to consider immunization without pausing for a moment to think about its history and the man responsible for developing its use. The man is Edward Jenner, a pupil of John Hunter. Jenner lived with Hunter for the first two years after coming to London and the friendship they developed continued after Jenner left London to start general practice in Berkeley, Gloucestershire. Jenner was profoundly influenced by Hunter's interest in natural history and in his methods of scientific investigation. To one of Jenner's questions, Hunter is said to have replied, '... I think your solution is just; but why think? why not try the experiment?...'

Even before Jenner, it had been noticed that an attack of smallpox protected against further disease. It was known that the epidemics varied in severity and that it was best to contract a mild form of smallpox as this resulted in life-long protection. This knowledge was widespread: in India, children were wrapped in clothing from patients with smallpox; in China, scabs from smallpox patients were ground and the powder was blown into the nostrils; in Turkey, female slaves were injected under the skin with dried preparations of pus from smallpox patients. Inoculated slaves fetched a high price while pock-marked slaves were worth nothing! Lady Mary Wortley

Figure 6.18 Edward Jenner (Reproduced with permission from Wellcome Library, London)



Clinical case: atherosclerosis 195

Diabetes

The risk of a myocardial infarction in a diabetic patient is twice that of a non-diabetic patient and, as our clinical scenario illustrated, their arterial disease is widespread. Arterial disease accounts for around 70 per cent of the deaths of diabetics in Western countries. A possible mechanism is change in lipids so that HDL may be decreased and LDL increased because receptor-mediated catabolism is reduced.

Other possible risk factors

- lack of regular exercise
- obesity
- low weight at 1 year of age
- 'type A' personality/stress
- low socio-economic group
- *C. pneumoniae* infection.

It has been suggested that infection, especially with *Chlamydia pneumoniae* or cytomegalovirus, might increase the risk of atheroma. The potential mechanisms could include altering the response of the vascular wall cells to injury and promoting chronic inflammation within the wall. Although seroepidemiological studies and direct detection of bacterial components in atherosclerotic lesions provides some evidence, the hypothesis is far from accepted. Fetal origin of adult disease is more widely accepted, especially the association between low birth weight or low infant weight and subsequent development of hypertension and cardiovascular disease.

Key facts

Risk factors for atherosclerosis

Unmodifiable	age, gender, personality
Modifiable	diabetes, hyperlipidaemia
Preventable	smoking, obesity

Metabolic syndrome

With the increasing availability and effectiveness of interventions, it is crucially important to identify those at increased risk of cardiovascular disease so that they can be appropriately treated and their risk reduced (Fig. 8.7). The conventional risk factors (see above) have been used to construct models used in clinical practice and many of these are derived from Framingham data. There has been interest in recent years as to whether the 'metabolic syndrome' is an independent risk factor. Definitions of the metabolic syndrome vary but are based on the combination of impaired glucose metabolism, hypertension, dyslipidaemia and central obesity. Studies conflict on its clinical usefulness with a recent large community-based study in middle-aged men demonstrating a 1.4 increased risk for total mortality and 1.6 increased risk for cardiovascular mortality after accounting for conventional risk factors.

Figure 8.7 Lifestyle changes: a lot could be said to recommend a return to the low-fat, fibre-rich dietary habits of our forbears, with plenty of exercise

Key facts

Metabolic syndrome

Definition	Indicative measurement
Impaired glucose tolerance	Fasting glucose >6.1 mmol/L
Hypertension	BP > 130/85
Dyslipidaemia	Triglycerides >1.7 mmol/L HDL cholesterol <1.04 mmol/L
Central obesity	BMI > 29.4 kg/m²
	Waist circumference >102 cm

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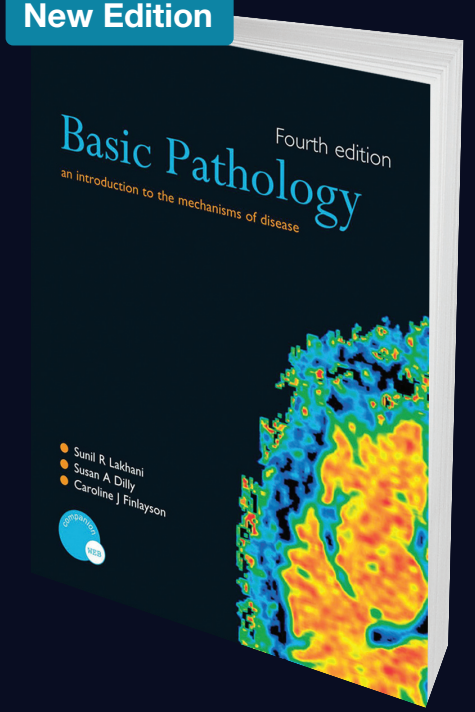

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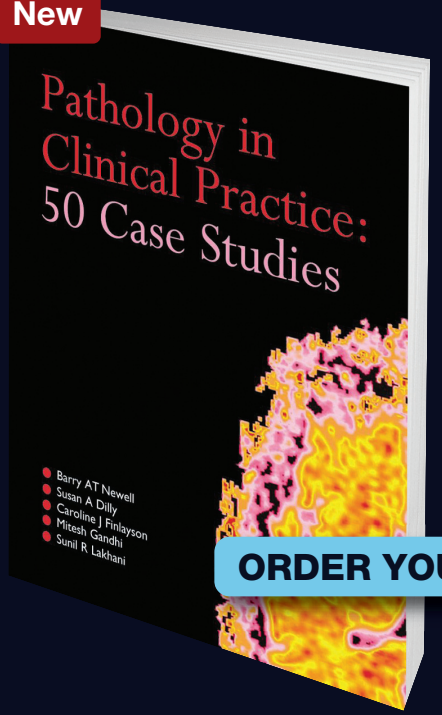

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An Introduction to the Mechanisms of Disease

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Sunil R Lakhani, Susan A Dilly, Caroline J Finlayson

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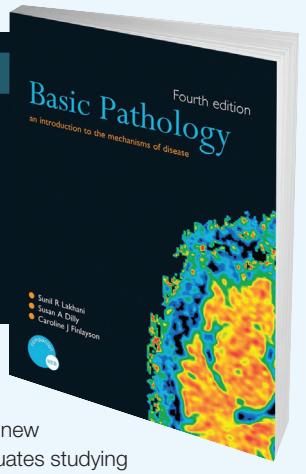

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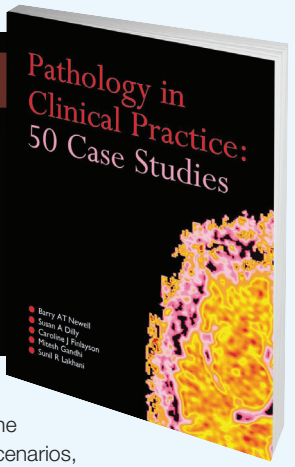

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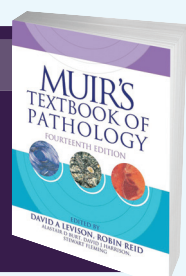

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