



Figure 18.2
Superficial lymphatic drainage patterns of the body showing watersheds.

Causes of edema are:

- **increased permeability of the capillaries** resulting from inflammation, tissue trauma, immune response or burns (*Porth, 1990*);
- **obstruction of the lymphatic flow** due to infection, parasites in the lymphatic system, lymphatic disease, surgical removal of the lymph nodes, radiation treatment, scarring or a congenitally reduced number of lymph vessels. Obstruction of the lymphatics (lymphostasis) leads to a retention of plasma proteins, which, in turn, attracts more fluid. This is called a low-flow, high-protein edema (*Casley-Smith, Casley-Smith, 1986*);
- **increased capillary pressure** (or venous pressure) from heart failure, thrombophlebitis, pregnancy or a generalized allergic response such as hives. Edema forms in the extremities in hot weather due to capillary dilation and sodium retention. An increase in sodium retention leads to premenstrual edema (*Cawson et al., 1982; Porth, 1990*). There is also gravity-induced (orthostatic) edema from prolonged standing or sitting