

# PBL-XI

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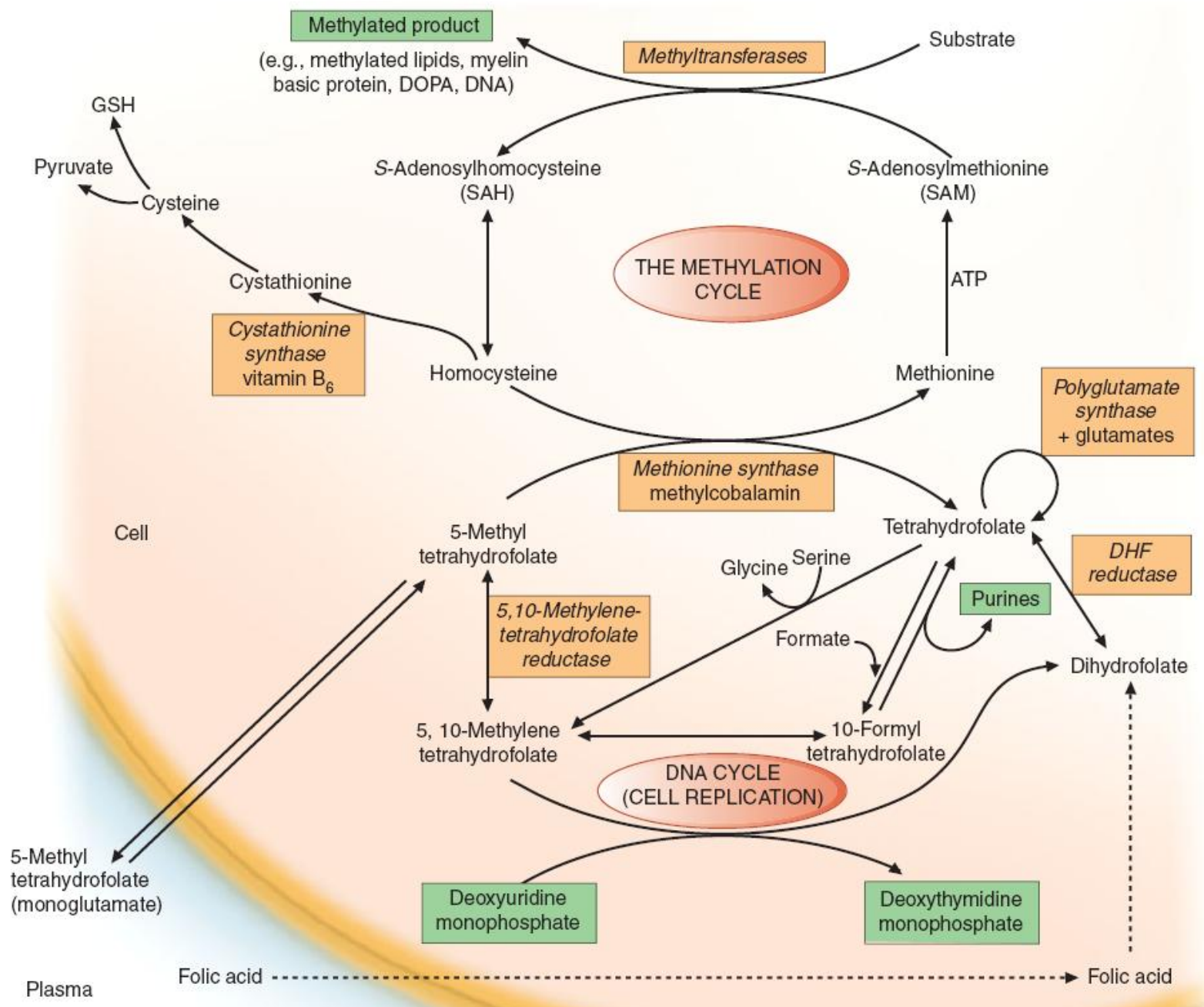
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# Pernicious Anemia

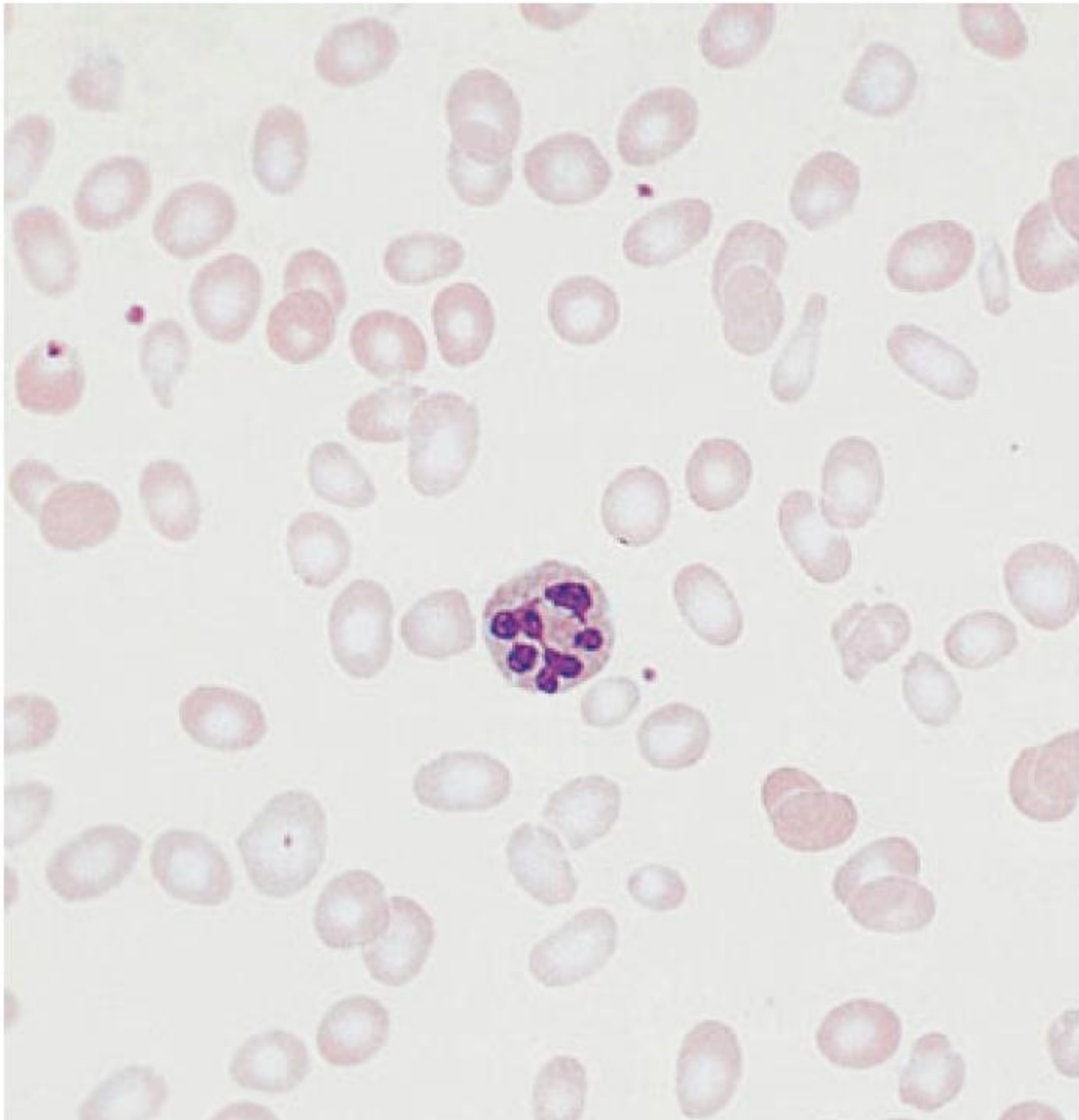


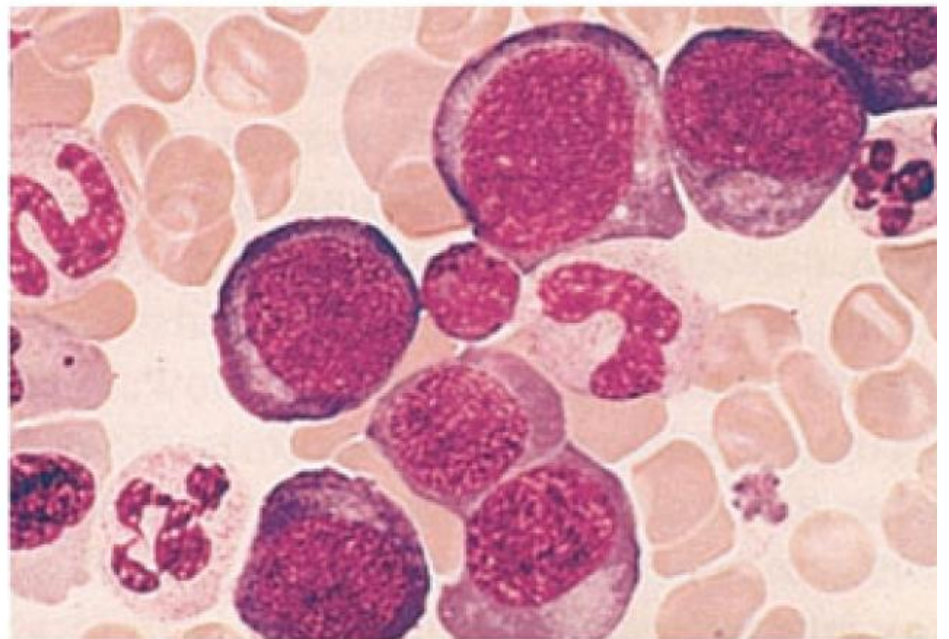
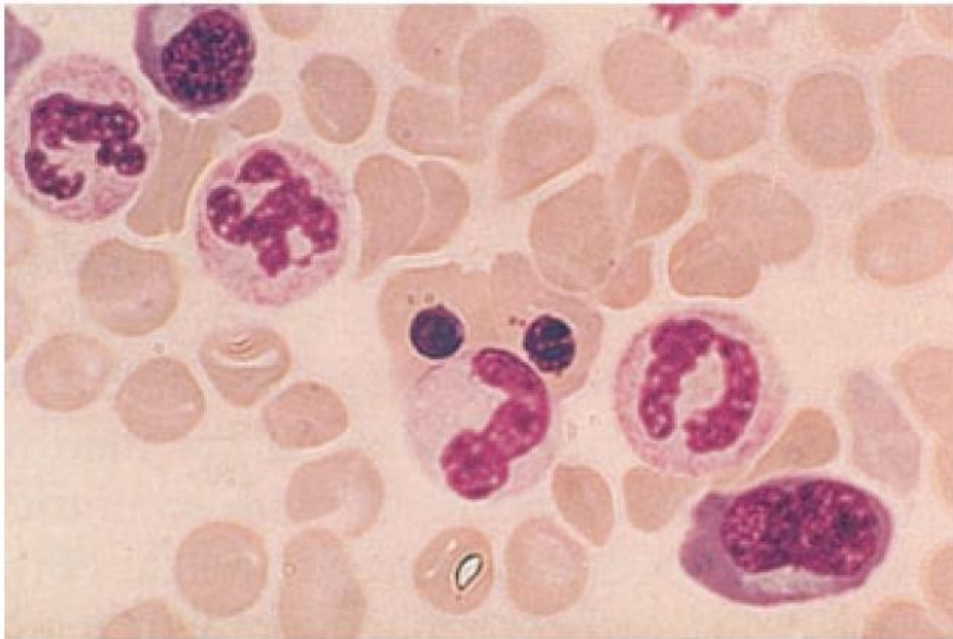
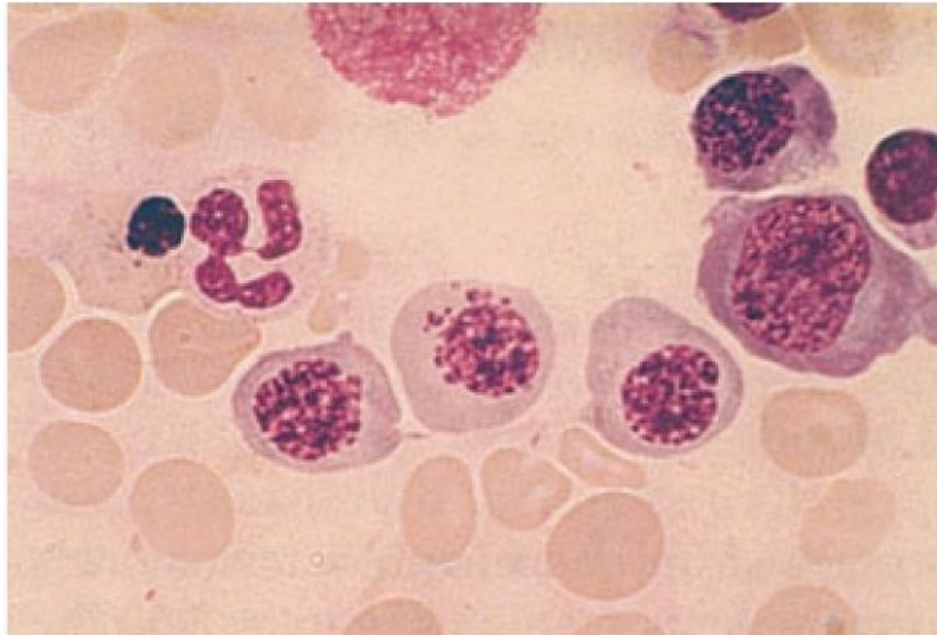
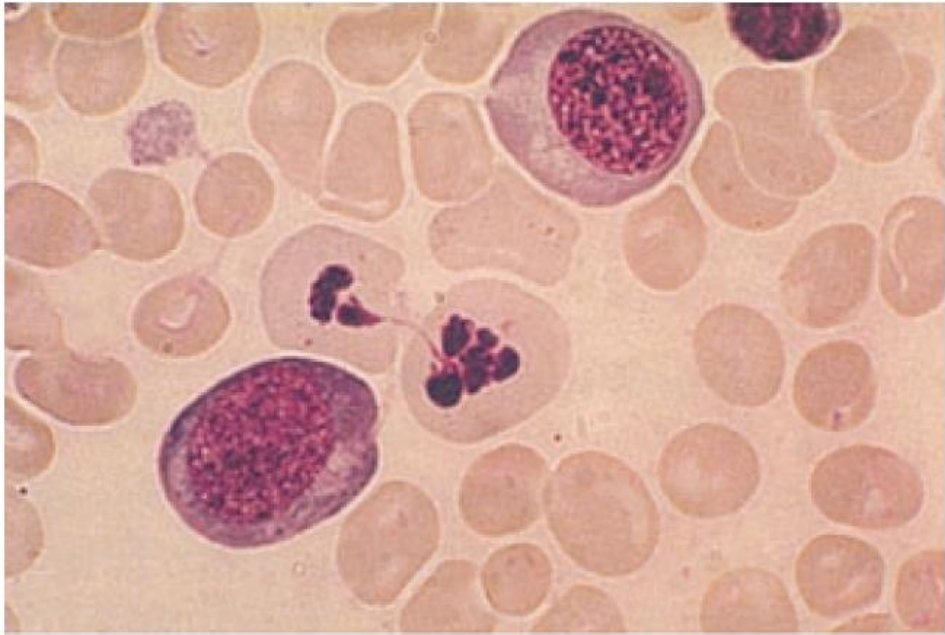
# Clinical Features

- The main clinical features in more severe cases are those of anemia.
- Anorexia is usually marked and there may be weight loss, diarrhea, or constipation.
- Glossitis, angular cheilosis, a mild fever in the more severely anemic patients, jaundice (unconjugated), and reversible melanin skin hyperpigmentation may also occur with deficiency of either folate or cobalamin.

# Clinical Features

- Thrombocytopenia sometimes leads to bruising, and this may be aggravated by vitamin C deficiency or alcohol in malnourished patients.
- The anemia and low leukocyte count may predispose to infections, particularly of the respiratory or urinary tracts.
- Cobalamin deficiency has also been associated with impaired bactericidal function of phagocytes.







## CAUSES OF COBALAMIN DEFICIENCY SUFFICIENTLY SEVERE TO CAUSE MEGALOBLASTIC ANEMIA

Nutritional

Vegans

Malabsorption

Pernicious anemia

Gastric causes

Congenital absence of intrinsic factor or functional abnormality

Total or partial gastrectomy

Intestinal causes

Intestinal stagnant loop syndrome: jejunal diverticulosis, ileocolic fistula, anatomic blind loop, intestinal stricture, etc.

Ileal resection and Crohn's disease

Selective malabsorption with proteinuria

Tropical sprue

Transcobalamin II deficiency

Fish tapeworm

# Specific Investigations

- Serum Cobalamin
- Serum Methylmalonate and Homocysteine
- Cobalamin Absorption

# Serum Cobalamin

- This is measured by ELISA.
- The normal range is 160 – 1000 ng/L.
- Clear-cut anemia is usually below 100 ng/L.
- The more severe the anemia, the lower the concentration.
- The serum cobalamin level is robust, cost-effective, and most convenient to rule out B12 deficiency in the vast majority of patients.

# Serum Methylmalonate (MMA)

- In patients with cobalamin deficiency sufficient to cause anemia or neuropathy, the serum MMA level is raised.
- Sensitive methods for measuring MMA in serum have been introduced and recommended for the early diagnosis of cobalamin deficiency.
- Serum MMA levels fluctuate, however, in patients with renal failure.

- Levels are also raised in chronic renal disease, alcoholism, smoking, pyridoxine deficiency, hypothyroidism, therapy with steroids, cyclosporine, and other drugs.

# Cobalamin Absorption

- Studies of cobalamin absorption have been widely used, but difficulty in obtaining radioactive cobalamin and of ensuring IF preparations are free of viruses have led to reduced availability.
- For the urinary excretion (Schilling) test, the patient is fasted overnight. Radioactive cyanocobalamin is given orally. Then, 2 hours later an IM injection of cyanocobalamin or hydroxocobalamin (1 mg) is given ("flushing dose").

- A 24-hour urine specimen is collected for determination of radioactivity; low excretion shows malabsorption; the oral dose is then given again after 48 hours with IF. The results distinguish between gastric and intestinal causes of cobalamin malabsorption.

# Management of Cobalamin Def.

- It is usually necessary to treat patients who have developed cobalamin deficiency with lifelong regular cobalamin injections.
- In the UK, the form used is hydroxocobalamin; in the United States, cyanocobalamin.
- In a few instances, the underlying cause of cobalamin deficiency can be permanently corrected, e.g., the fish tapeworm, tropical sprue, or an intestinal stagnant loop that is amenable to surgery.



- Large oral doses of cyanocobalamin have been proven to penetrate through the mucous membranes and overcome the lack of IF in PA.
- Also, sublingual B-12 may be considered as an option in those for whom injections would be difficult.

Thanks