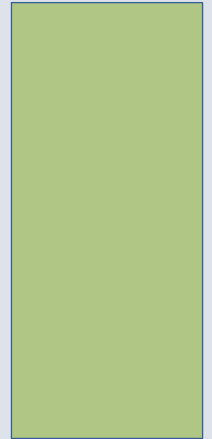


FOOD BORNE BACTERIAL DISEASES

DR. HIRA MUSHTAQ



INTRO

- microbial food borne outbreaks are of wide range and abundant.
- Most common pathogens are *Campylobacter* spp., *Toxoplasma gondii*, *Salmonella* spp., *Listeria monocytogenes* and norovirus
- botulism from under- processed canned foods:
- staphylococcal poisoning from unrefrigerated cream-filled pastries, sliced ham. meat, and poultry salads;
- salmonellosis from infected animal products were known even half century ago.
- New pathogens have emerged, and some have spread worldwide. Many, including *Salmonella*. *Escherichia coli* 0157:1-17, *Campylobacter*. and *Yersinia enterocolitica*. have reservoirs in healthy food animals, from which they spread to an increasing variety of foods.



CAMPHYLOBACTER JEJUNI

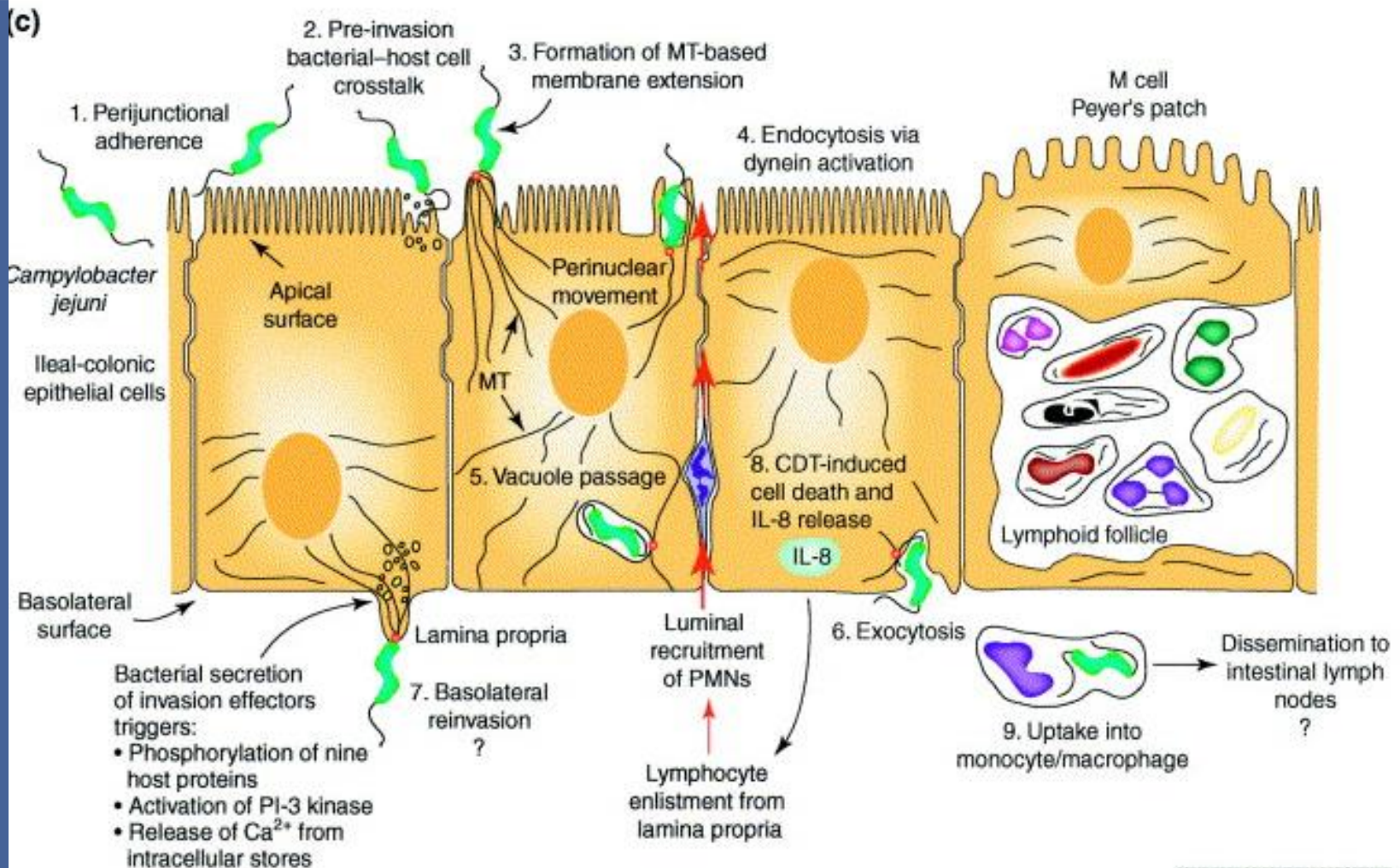
SPECIE

- produce both diarrheal and systemic illnesses
- helical-shaped, non-spore-forming, Gram-negative
- *C. jejuni* grows best at 37°C to 42°C (the approximate body temperature of the chicken (41°C to 42°C)).
- microaerophilic (5% O₂, 10% CO₂, and 85% N₂)
- . The organism is sensitive to freezing, drying, acidic conditions (pH ≤ 5.0), and salinity.

SOURCE AND TRANSMISSION

- chickens, turkeys, cows, and other animals that show no signs of illness carry *Campylobacter*.
- carried in the intestines, liver, and other organs of animals and can be transferred to other edible parts when an animal is slaughtered.
- infection by eating raw or undercooked poultry or eating something that touched it.
- also get it from eating other foods, including seafood, meat, and produce, by contact with animals, and by drinking untreated water

PATHOGENESIS



SYMPTOMS

- Symptoms usually start 2 to 5 days after infection and last about 1 week including:
 - diarrhea (often bloody),
 - fever,
 - stomach cramps
 - Nausea and vomiting
- Some people experience complications, such as irritable bowel syndrome (Guillain-Barré syndrome), temporary paralysis, and arthritis.

- **Diagnosis**

- Campylobacter bacteria in stool (poop), body tissue, or fluids. The test could be a culture that isolates the bacteria or a rapid diagnostic test that detects genetic material of the bacteria.

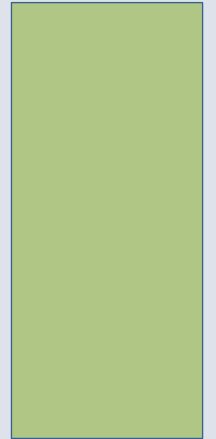
- **Treatment**

- Most people recover from Campylobacter infection without antibiotic treatment. Patients should drink extra fluids as long as diarrhea lasts.
- erythromycin the drug of choice for *C. jejuni* infection

- **Control**

- strict hygiene reduces intestinal carriage in food-producing animal

CLOSTRIDIUM
BOTULINUM



SPECIE

- an anaerobic,
- rod-shaped
- sporeforming
- Gram positive bacterium
- produces a protein with characteristic neurotoxicity
- There are seven recognized antigenic types: A through G based on toxin produced.
- Botulism, a severe form of food poisoning results when the toxin-containing foods are ingested. Although this food illness is rare, its mortality rate is high

- The toxin enters the body in one of three ways:

Infant botulism

Colonization of the digestive tract by the bacterium in children (honey is a known source of bacteria spores)

Foodborne botulism

Ingestion of toxin from foods (pH above 4.5)

Wound botulism

Contamination of a wound by the bacterium

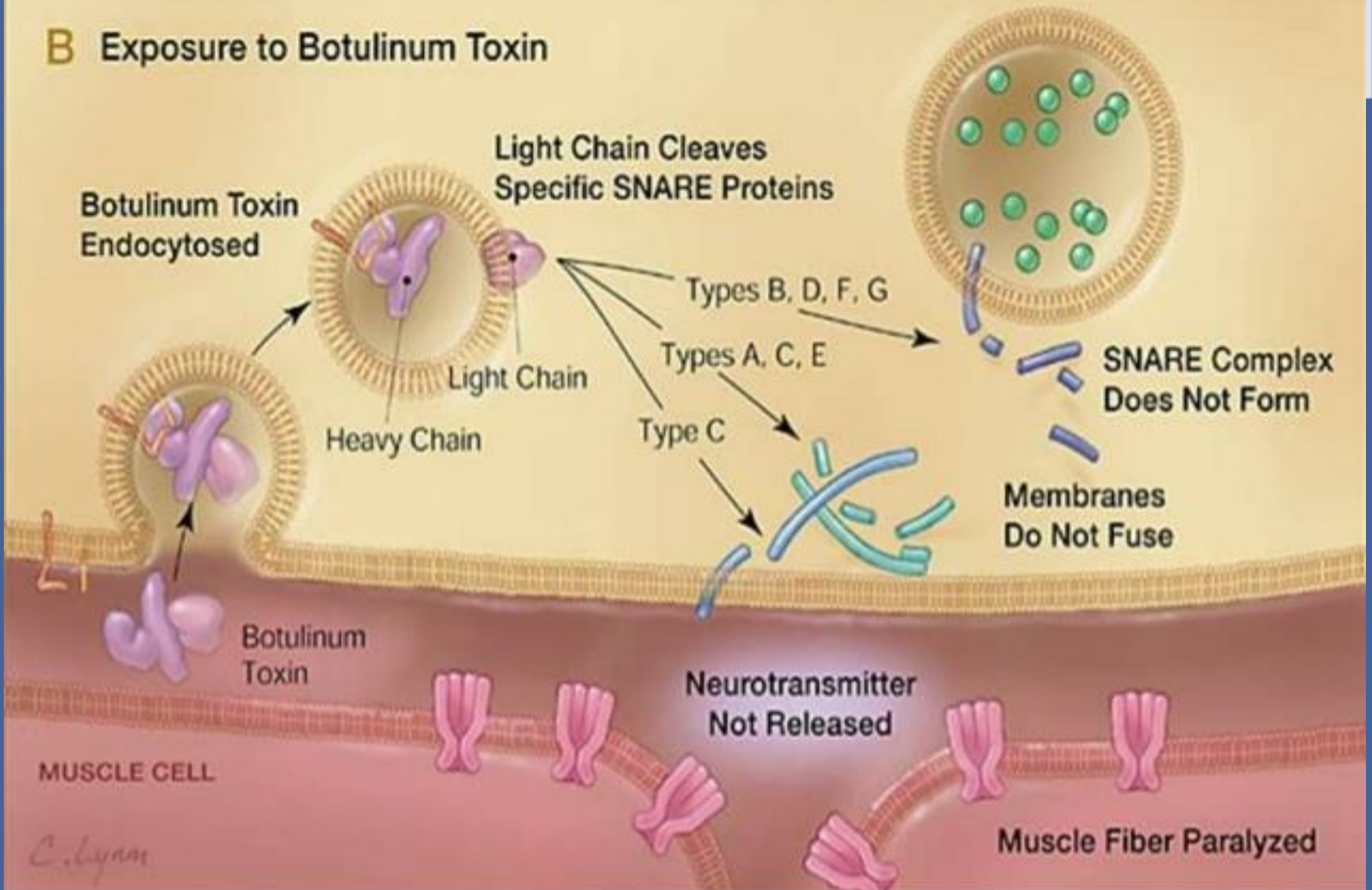


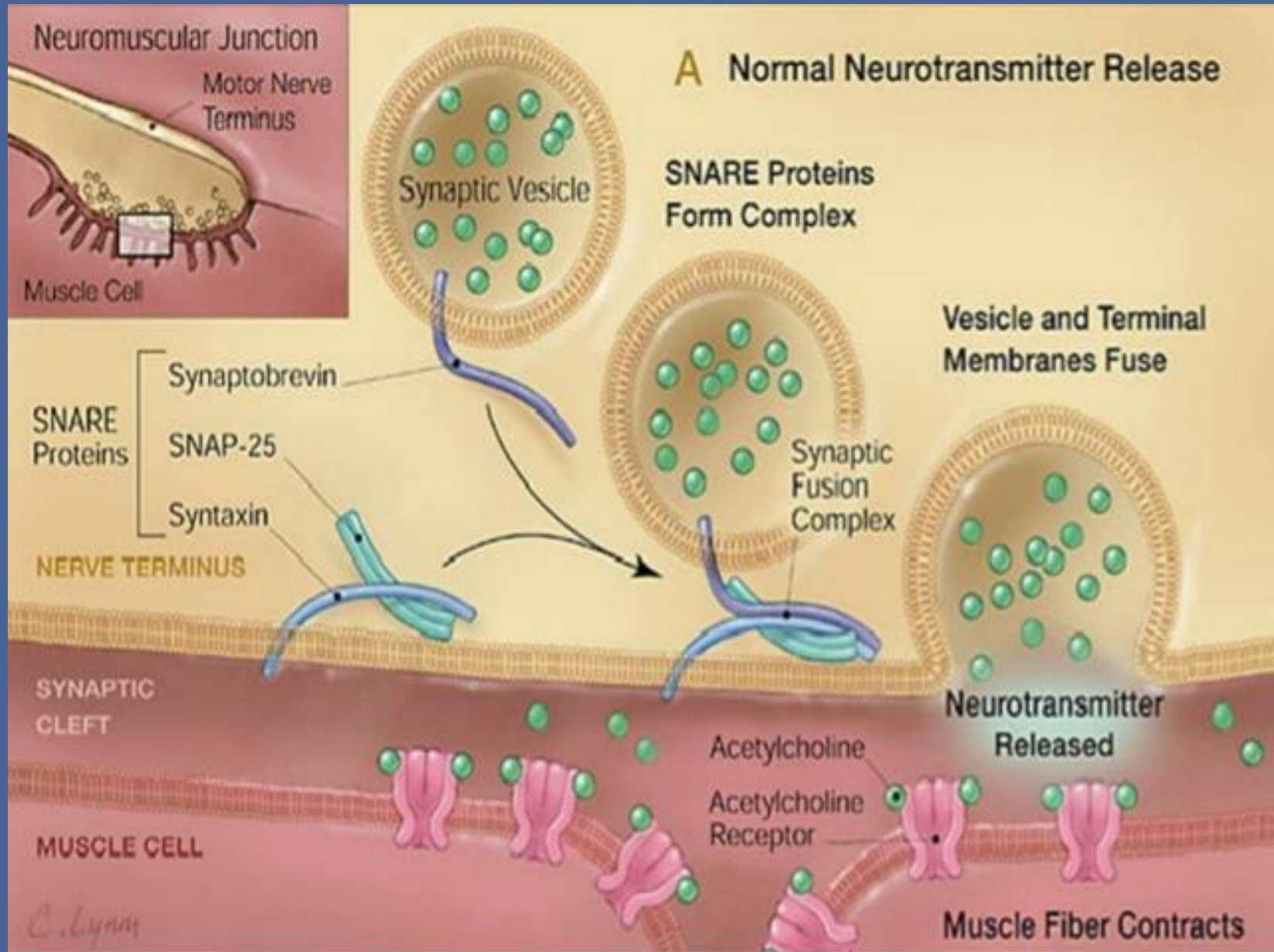
SOURCE AND TRANSMISSION

- *C. botulinum* is widely distributed in soils and in sediments of oceans and lakes
- Honey
- Types A and B are most commonly encountered in foods associated with soil contamination.
- nutritional and anaerobic requirements are supplied by many canned foods and by various meat and fish products.
- Home-canned foods are more often a source of botulism than are commercially canned foods

PATHOGENESIS

B Exposure to Botulinum Toxin





SYMPTOMS

- Nausea n vomiting
 - Stomach pain
 - Difficulty in swallowing and speaking
 - Double vision/ blurred vision
 - Trouble breathing
 - Facial weakness
-
- Diagnosis
 - Clinical diagnosis of botulism is most effectively confirmed by identifying botulinal toxin in the blood, feces, or vomitus of the patient.

CONTROL

- reduction of the microbial contamination level,
- acidification,
- reduction of moisture level,
- and whenever possible, destruction of all botulinal spores in the food.
- Heat processing is the most common method of destruction.
- suitable foods naturally or by design,
- is acidic (of low pH),
- has low water activity,
- a high concentration of NaCl,
- an inhibitory concentration of NaNO_2 or other preservative, or two or more of these conditions in combination.
- Refrigeration will not prevent growth and toxin formation by nonproteolytic strains unless the temperature is precisely controlled and kept below 3°C .