**Infectious agent of malaria:** Malaria is caused by parasites of the Plasmodium genus. Four species of Plasmodium can infect humans: P. vivax, P. ovale, P. malariae and P. falciparum. (1)

**Transmission:** One of the four types of the Plasmodium parasite that cause malaria, is transmitted to human via female Anopheles mosquitoes. (2,8) Malaria can also be transmitted through blood transfusion, organ transplant, or the shared use of needles or syringes contaminated with blood.

**Reservoirs:** Malaria is not spread from person to person like a cold or the flu, and it cannot be sexually transmitted. Humans are the only reservoir for Malaria. (3) Anyone can get malaria. Most cases occur in people who live in countries with malaria transmission. Also, an infected mother can transmit malaria to her infant before or during delivery. (4)

**General Characteristics of MO:**
Malaria is caused by protozoan parasites of the genus Plasmodium – single-celled organisms that cannot survive outside of their host(s). (5)
The life cycle for all the five species that infect humans and follows three stages:
(I) Infection of a human with sporozoites
(II) Asexual reproduction
(III) Sexual reproduction
The two first stages take place exclusively into the human body, while the third one starts in the human body and is completed into the mosquito organism. (6)
**Key Tests for Identification:** Types of test to detect malaria:

- **Thick and thin blood smears:** the most widely used test for diagnosing malaria is a blood smear. This is stained, usually with Giemsa stain, and observed under 100X oil immersion.

- **Molecular test:** Also known as polymerase chain reaction test, it can identify the type of parasite, which helps your doctor decide which drugs to prescribe. This test is a good choice if your blood has low number of parasites or if the results of your blood smear are vague. (7)

**Signs and Symptoms of Disease:**

Most of the time symptoms begin 10 days to 4 weeks after infection, although a person may feel ill as early as 7 days or as late as 1 year later. P. vivax and P. ovale kinds of malaria can relapse. During the treatment, some of the parasites can remain in the liver for several months to a year and can relapse. The symptoms include fever and flu-like illness, including shaking chills, headache, muscle aches, and tiredness. Nausea, vomiting, and diarrhea may also occur. Malaria may cause anemia and jaundice (yellow coloring of the skin and eyes) because of the loss of red blood cells. If not promptly treated, the infection can become severe and may cause kidney failure, seizures, mental confusion, coma, and death. (8,2)

**Historical information:**

the malaria word comes from Italian which mean “bad air”. Alphonse Laveran, a French army doctor, described the malarial parasite and proposed that it caused malaria in 1880. The final piece of the puzzle was put into place by a British physician, Sir Ronald Ross, who was working in India in 1897 when he observed the development of oocysts in mosquitoes that had been fed on infected individuals. “Ross's description of the complete life cycle of the malarial parasite won him the Nobel Prize for Medicine in 1902”. (9)

**Virulence factors:** The Plasmodium species have two main virulence factors which are the ability to change surface antigens readily and toxins that are released. It is the toxins that are released that cause the symptoms associated with malaria; fever, chills, sweats, etc. (10)
Control/Treatment: The control of malaria can be done by so many things. For example: In Asia, we use bed nets, wood smokes, make sure to clean around the house by not letting the rainwater makes a puddle, or throw trash around the house. Treatment can be done by making sure children get checked up as soon as possible by a doctor if they are unwell during malaria season since they are always outside and playing where adults can’t always protect them. There are some drugs that doctors usually prescribe it to the patients who are traveling or came from another country like Malarone, which is a combination of two antimalarial medicines (atovaquone and proguanil). Malarone is taken to treat malaria caused by chloroquine-resistant P. falciparum. Quinine plus an antibiotic such as clindamycin, doxycycline, or tetracycline for most P. falciparum infections. Antibiotic or Anti-parasite are given to kill the parasite or to stop the growth or to kill the bacteria. (11)

Prevention/Vaccine info, new trials: Small precaution can save lives, by that mean a little education to people who are unknown about this disease can be more profitable and maybe the percentage could go down. Wearing long sleeves during summer season especially in Asian and Africa is necessary. There are no vaccines for malaria however many of them went through trials like RTS, S/AS01, but as of now, the new one is going around for research and trials which is to inject the live malaria parasite inside humans body. “The vaccine was tested in 67 adults with no history of malaria, found to be working after three doses, four weeks apart” (12) seems to be working even after 10 weeks, the vaccine is the protection of malaria, not a cure.

Local cases or outbreaks (with incidence figures): “From 2010–2014, between 14–24 persons have been diagnosed with malaria each year in Dallas County.” (13)

Global cases or outbreaks (with incidence figures): According to the report, there were 212 million new cases of malaria worldwide in 2015 (range 148–304 million). (14) Most of the death happened in Africa but surprising the percentage of death fell in that year.
Reference:


