Transparency and Accountability Network

IMMC

Integrated Mosquito and Malaria Control

Mosquitoes and Malaria

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A critical step in the transmission of malaria.

If the human has malaria the mosquito becomes infected.

If the mosquito has malaria the human becomes infected.

If neither has malaria then neither become infected.

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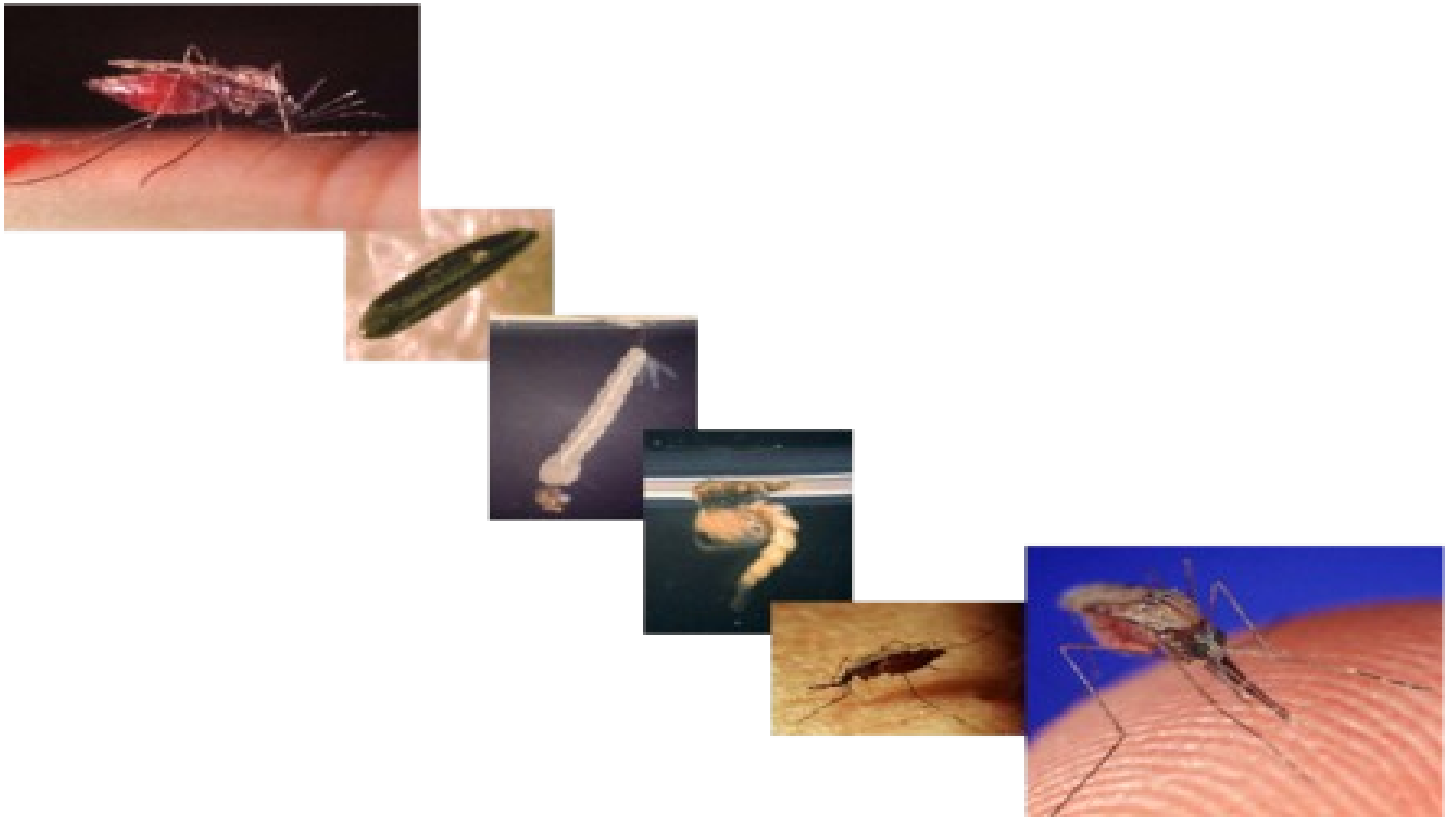
Stages in the life of a mosquito



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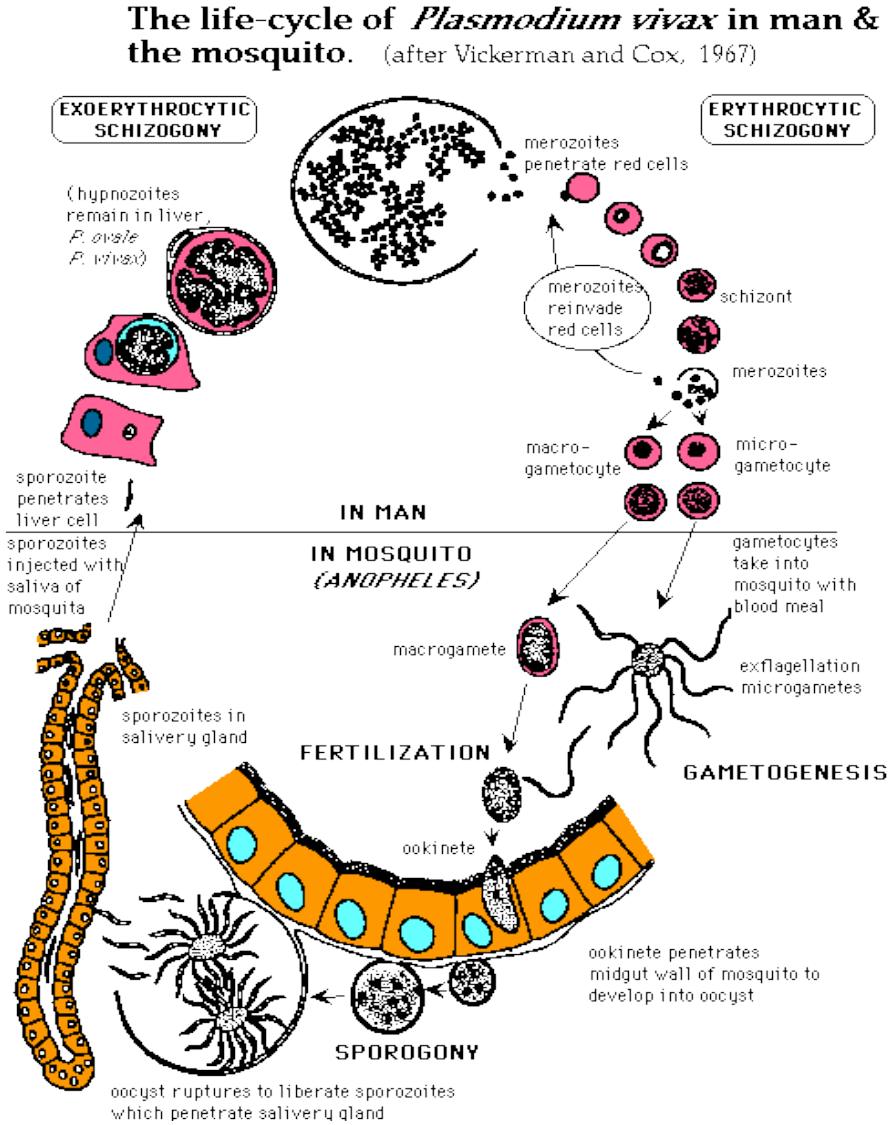
Life cycle of *Plasmodium vivax*



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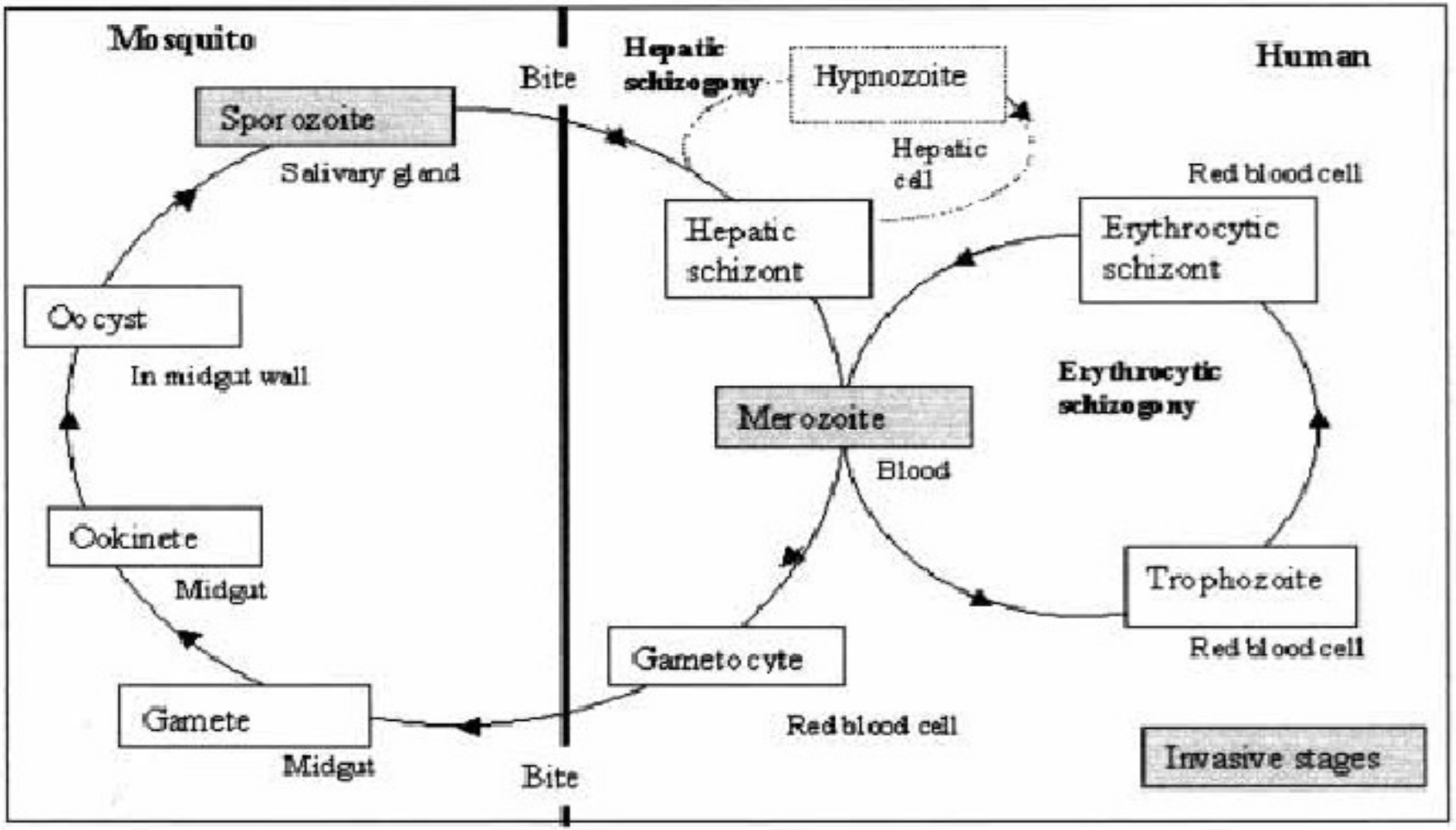
Life cycle of *Plasmodium* malaria parasite



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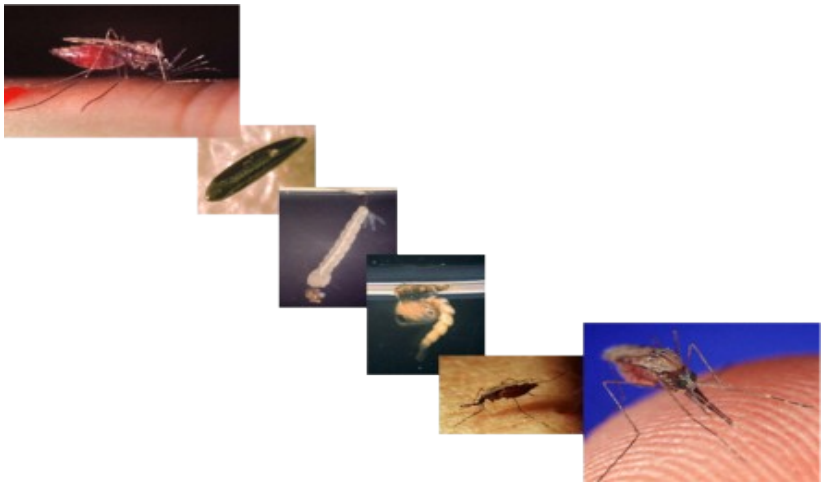
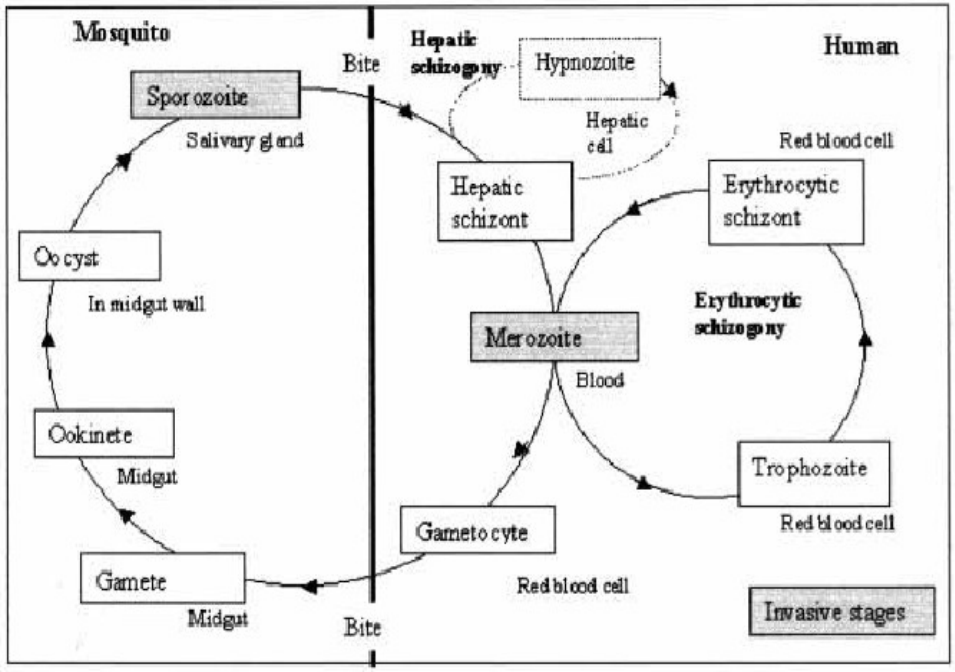
Malaria results from parasite and its vector

Mosquito – the vector



Malaria – the parasite



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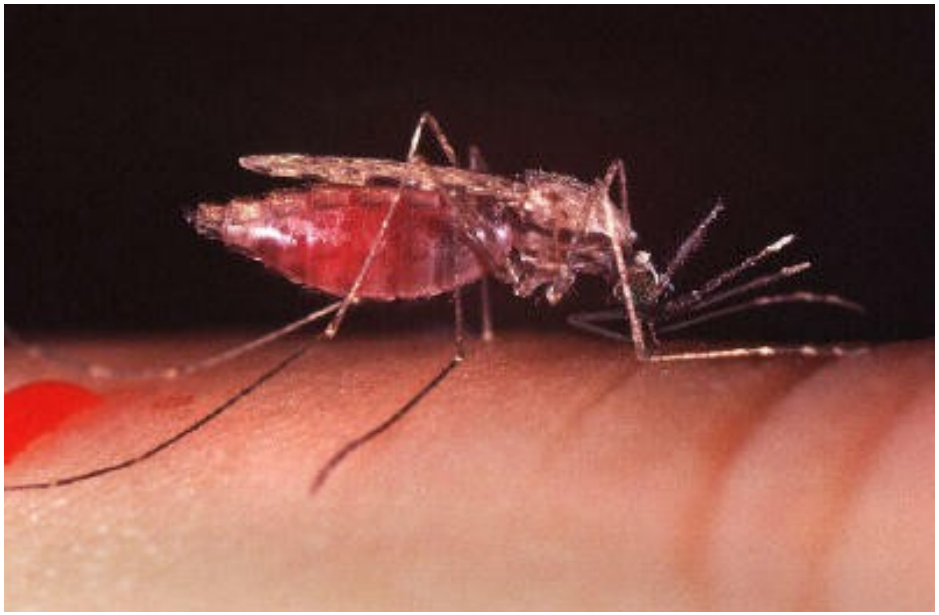

This mosquito has engorged herself with human blood and will soon move on to another person.

If this blood contains malaria parasite, there will be malaria transmission.

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Mosquitoes

Reduce the number of mosquitoes.

Reduce the number of contacts with humans.

Reduce the number of mosquitoes carrying malaria parasite.

Malaria

Treat cases of malaria to reduce health consequences for the patient.

Treat cases so that mosquitoes cannot pick up malaria for transmission

Deploy a vaccine (when one becomes available)

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Malaria

Treat cases of malaria to reduce health consequences for the patient.

- **Chloroquine treatment – low cost but parasite often resistant.**
- **Fansidar type treatment – more expensive, and less resistance.**
- **Artemisinin combination therapy – much higher cost and little resistance at present.**

Malaria is a nasty disease. It kills children at an alarming rate. Adults are debilitated by the attacks, and many die.

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Malaria

Deploy a vaccine (when one becomes available).

- **Progress has been made in the development of a vaccine, but it is low priority for the major pharmaceutical companies and overall research funding.**

Even if a vaccine is developed, it is far from clear that there will be programs and funding to deploy it where it is most needed, in desparately poor nations in Africa.

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Malaria

Treat cases so that mosquitoes cannot pick up malaria for transmission.

- **It does not matter where the cycle of infection and reinfection with the malaria parasite is interupted ... as long as it is interupted.**
- **In poor countries it is unlikely that there will be anything like complete treatment of malaria cases, and accordingly it is likely that the best place to interupt the cycle of transmission is with the mosquito.**

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Mosquitoes

Reduce the number of mosquitoes.

- **Ultra low volume (ULV) outdoor spraying with Dibrom or equivalent either using aircraft, truck mounted sprays or hand carried equipment. This reduces the number of flying mosquitoes.**
- **Larvaciding to kill larvae, and prevent the rebuilding of a mosquito population. Larvacides are applied in places where larvae have been detected.**
- **Interior residual spraying (IRS) that kills some mosquitoes inside a treated space ... and encourages mosquitoes to remain outside or move outside where outside spraying will impact them.**

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Mosquitoes

Reduce the number of mosquitoes (2).

- A competent ULV program can reduce mosquito population by 80% within 24 hours of treatment.
- The challenge is to keep the mosquito population from growing back to its previous equilibrium level.
- Locate the breeding areas, and apply larvaciding prior to development of adult mosquitoes.
- Where a population reemerges, do a rapid repeat of the ULV treatment program.
    - If there is a problem is emerging resistance to the pesticide, change pesticide to something else quickly.

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Mosquitoes

Reduce the number of contacts with humans.

- **If an adult mosquito is dead it will not bite another person.**
- **If a larva is destroyed, there will be no mosquito to bite anyone.**
- **If IRS is used, a mosquito may choose not to go into the house (the repellant effect) or leave before biting (the irritant effect)**
- **If bednets, especially long lasting insecticide treated nets (LLITN), are used, then biting is reduced when bednet it in use.**

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Mosquitoes

Reduce the number of mosquitoes carrying malaria parasite.

- **Reduce the number of bites**
- **Especially reduce the number of bites on malaria infected persons**
  - **Keep malaria infected people away from mosquitoes**
  - **Encourage malaria infected people to use bednets**
  - **Keep malaria infected people at a distance from healthy people**

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Environmental clean up can make a difference.

Any standing water has the potential to become a breeding place for mosquitoes.

This is a problem if there is malaria in the area.

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Avoid doing damage

- Avoid creating resistance of parasites to medications.
- Avoid creating resistant strains of mosquitoes.
- Avoid doing damage to the environment.
- Avoid collateral medical problems for staff and intended beneficiaries.

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Questions?

For more information:

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