

SHORT SNAPPER

Malaria: Significance of Parasite Burden

Greg German MD PhD FRCPC DTM&H (UK)

Medical Microbiologist &
Infectious Diseases Consultant

October 16, 2015

www.healthpei.ca/micro

@drgreggerman

This talk <https://goo.gl/wzMwKI>



No Disclosures

Objectives:

1. Review the presentation of severe malaria focusing on parasite burden
2. Recognized what immediate assistance is available directly or indirectly for the management of your patient
3. Provide the link for a comprehensive online malaria quiz

<http://goo.gl/vMtpOq> to give to your ID keepers

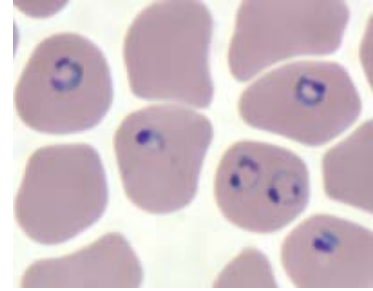


Osler vs. Malaria



1889.]

JOHNS HOPKINS HOSPITAL BULLETIN.

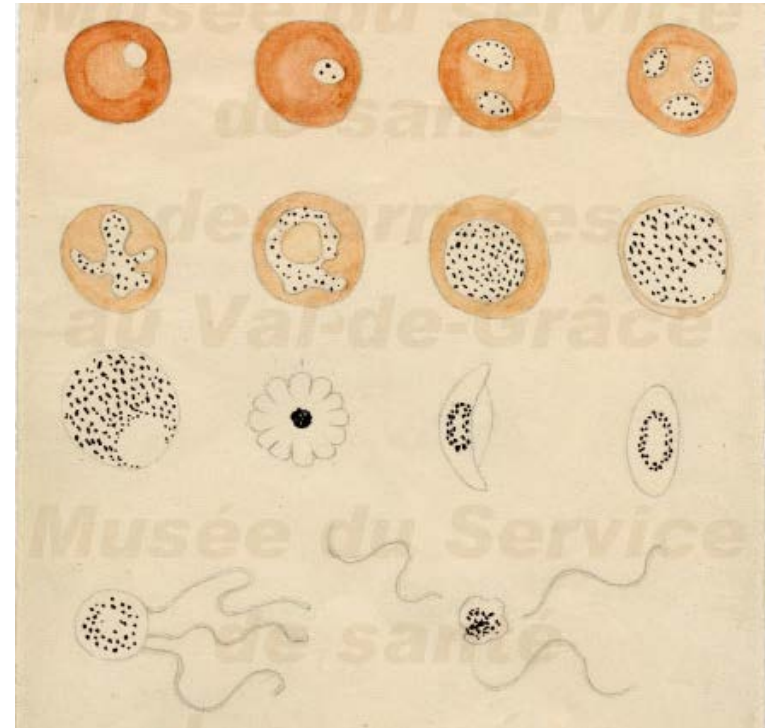


ON THE VALUE OF LAVERAN'S ORGANISMS IN THE DIAGNOSIS OF MALARIA.

By PROFESSOR WILLIAM OSLER, M. D.

The attitude of the profession on the question of micro-organisms of | lesson in the early part of the summer, in the case of an old man, aged 81,

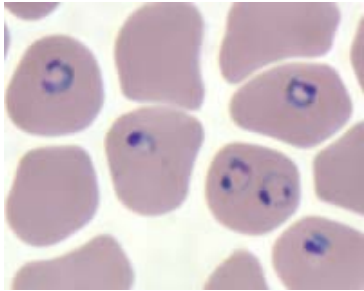
- Plasmodium still not consider conclusively the cause at the time
- Using unstained blood from finger pricks able to see refractile intracellular bodies, flagellated bodies with a very good microscope



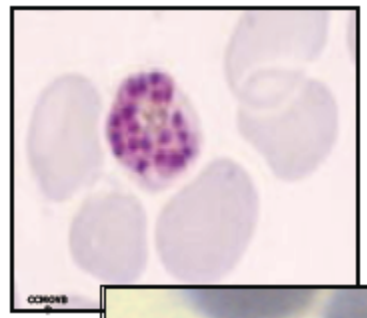
Plasmodium falciparum

- 8 hour doubling time
- Peripheral blood parasitemia smaller than End organ blood parasitemia due to adhesion to end organs.

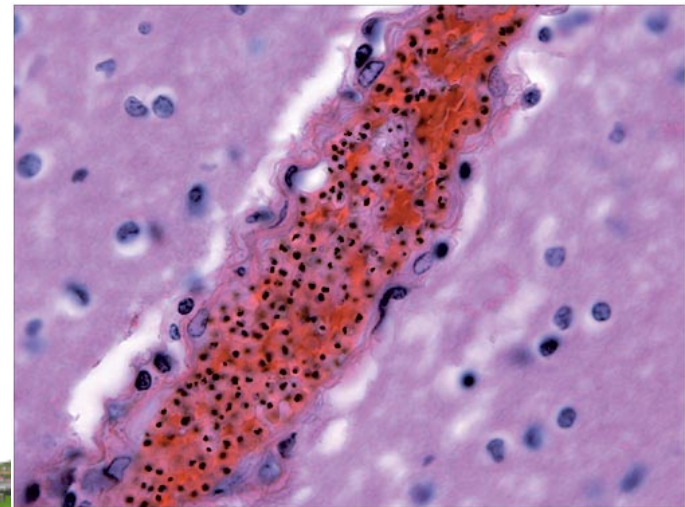
Peripheral blood



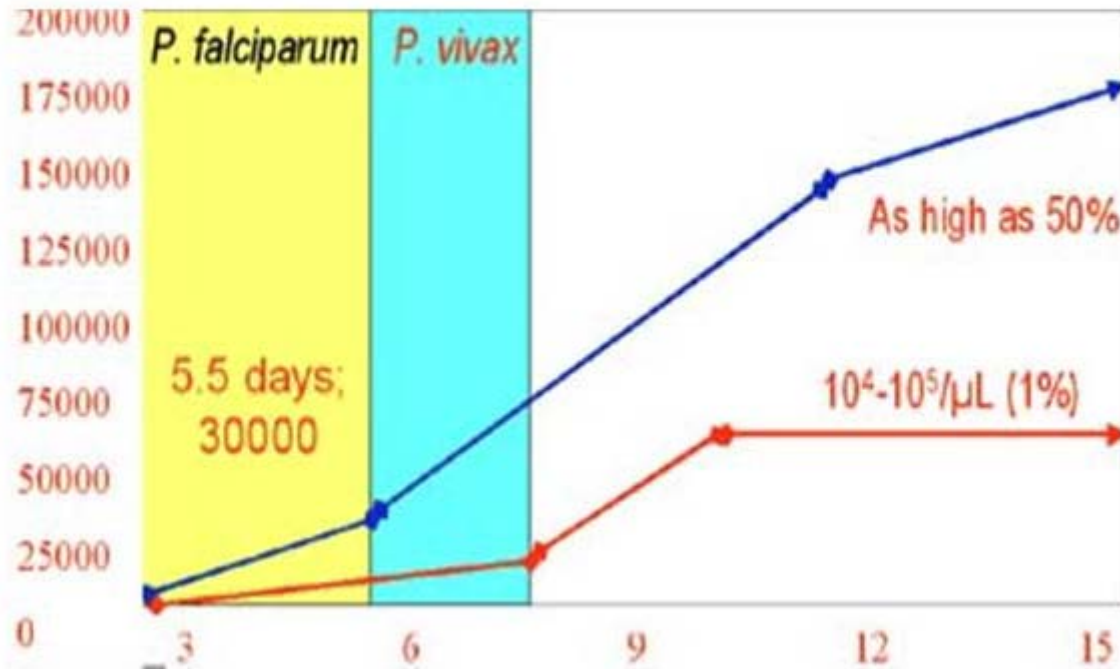
Schizonts



Brain



Vivax v faciparim



Whitty DTM&H LSTM&H 2011

Severe Malaria

- 30 cases across Canada in 2010
- *P. falciparum* Mortality \geq 20%
 - ▶ Versus 3.8% for all *P. falciparum*
- *P. vivax* (occasionally)
- *P. knowlesi* (emerging in Southeast Asia)
 - ▶ 2% parasitemia but reported out as *P. malariae*



Severe Malaria in Adults

Any one of the following:

Clinical Manifestations	Laboratory Tests
Prostration/ Impaired consciousness	Severe anemia (70 g/dL)
Respiratory distress	Hypoglycemia (<2.2 mmol/L)
Multiple convulsions (>2 in 24 hrs)	Acidosis (arterial pH <7.25 or bicarb <15 mmol/L)
Circulatory collapse (SBP <80)	Renal impairment (Cr >265 μ mol/L)
Pulmonary edema (radiological)	Hyperlactatemia (>5mmol/L)
Abnormal bleeding / DIC	Hyperparasitemia ($\geq 2\%$)*
Jaundice	Total bili >45 μ l
Hemoglobinuria (Blackwater fever)	



What is Hyperparasitemia

- WHO
 - ▶ 10% in high endemicity
 - ▶ 5% in low endemicity
- Canada: 2% latest definition CATMAT
 - ▶ Previous definition of $\geq 5\%$ in semi-immune; Sub-Saharan born and $< \text{age } 60$
- UK: 2% or presence of schizonts



Four things you want to know from the Lab

- Infecting species: May be multiple
- Density of infection: number of infected erythrocytes divided by the total number of erythrocytes in a high power field.
 - ▶ Multiple trophozoites (rings) in one cell counts as one
- Stage of infection trophozoites (mostly rings) or schizonts (16-36 per RBC) or gametocytes (extracellular bananas)
- Are you sure it isn't Babesia (Extracellular and intracellular forms)?

Timing to act for Malaria in general

- If fever, travel history and initial laboratory findings (low white blood count and/or platelets) and if smear / testing is delayed for more than 2 hours start a therapeutic antimalarial empirically.
- Minimum is 8 hour admission with repeat Smear indicating not increasing parasitemia

Timing / Burden & Severe Malaria

- If Quinine or artesunate is necessary and not available within one hours start quinine PO
- Seek an Infectious or tropical disease expert when managing severe falciparum malaria which requires ICU level care.
- $\geq 2\%$ in Canada = Severe Malaria
- $\geq 10\%$ consider exchange transfusion (5-10 PRBC)



CMN Adult Physician Contacts

Province	Name
B.C.	Dr. Katherine A. Plewes
Alberta (Calgary) (Edmonton)	Dr. Stephen Vaughan Dr. Stan Houston
M.B.	Dr. Stuart Skinner
Sask	Dr. Steve Sanche
Ontario (Ottawa) (Toronto) (Hamilton)	Dr. Anne McCarthy Dr. Andrea Boggild / ((Dr. Jay Keystone)) Dr. Shariq Haider
Quebec (Montreal-McGill) (Quebec City)	Dr. Christina Greenaway / Dr. Michael Libman Dr. Louise Côté
PEI	((Dr. Greg German))
N.B. (Horizon during the Day) (Vitalité and at night / weekend)	((Dr. Daniel Smyth / Dr. Gordon Dow)) Dr. Gabriel Girouard
N.S.	Dr. David Haldane
NFLD	Dr. Peter Daley

Dr. Anne McCarthy



- Switchboard 613-722-7000
- Office 613-737-8184
- Pager 613-760-7172
- Twitter @tropdocamcc
- Email: ammcarthy@toh.on.ca
 - ▶ Cc: CanadianMalariaNewtork@toh.on.ca
- Websites:
 - <http://thinkottawamedicine.ca/clinical-care/canadian-malaria-network/>
 - <http://www.phac-aspc.gc.ca/tmp-pmv/catmat-ccmtmv/index-eng.php>



Bring in the Americans...



- CDC Malaria Hotline (855-856-4713)
 - ▶ Monday through Friday 9-5pm EST
 - ▶ Clinicians and traveling public
- Afterhours hotline CDC Emergency hotline (770-488-7100) ask to speak with a CDC Malaria Branch Expert



ONE ISLAND FUTURE

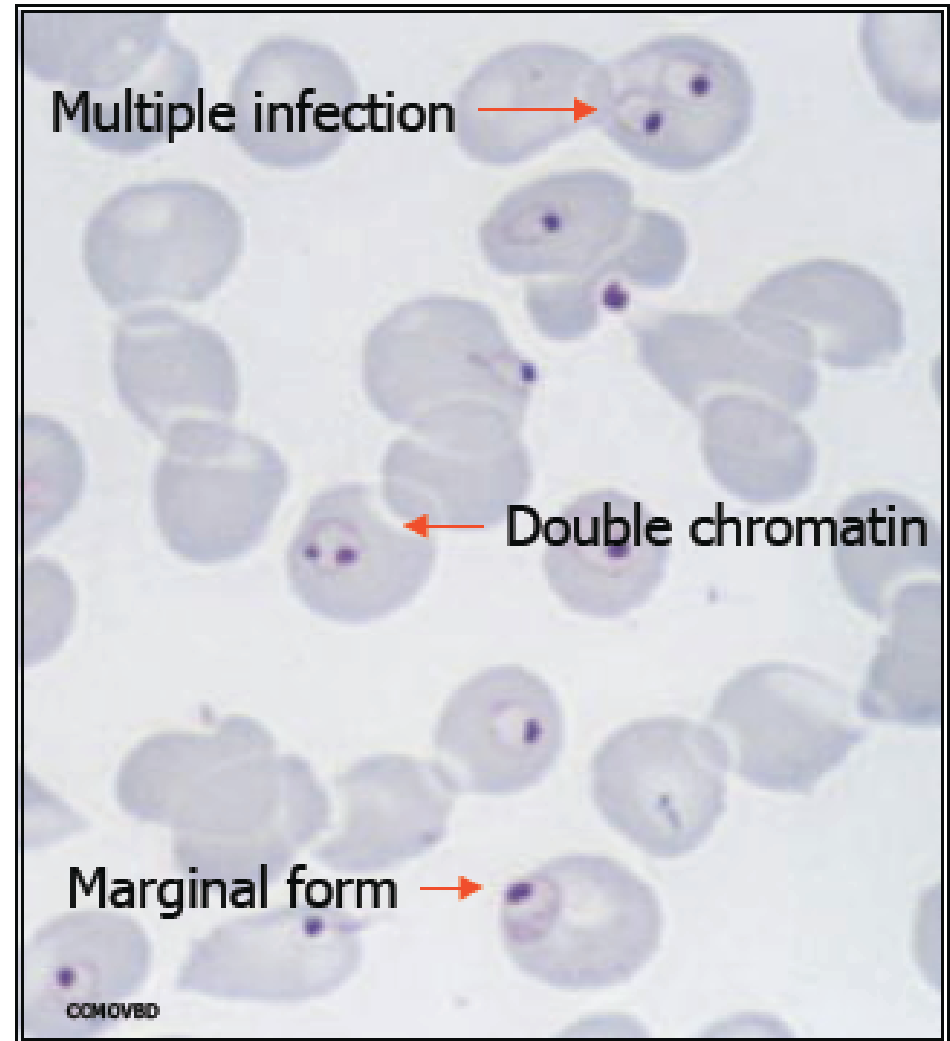
ONE ISLAND HEALTH SYSTEM

Canadian Pitfalls

- Co-existent Bacteremia and / or Influenza
- Babesia rather than malaria
- Platelet rather than malaria
- Sexual form of malaria which is not dangerous to humans, and can persist
- Loading dose not given
- Using prophylaxis sized doses for treatment

DIY

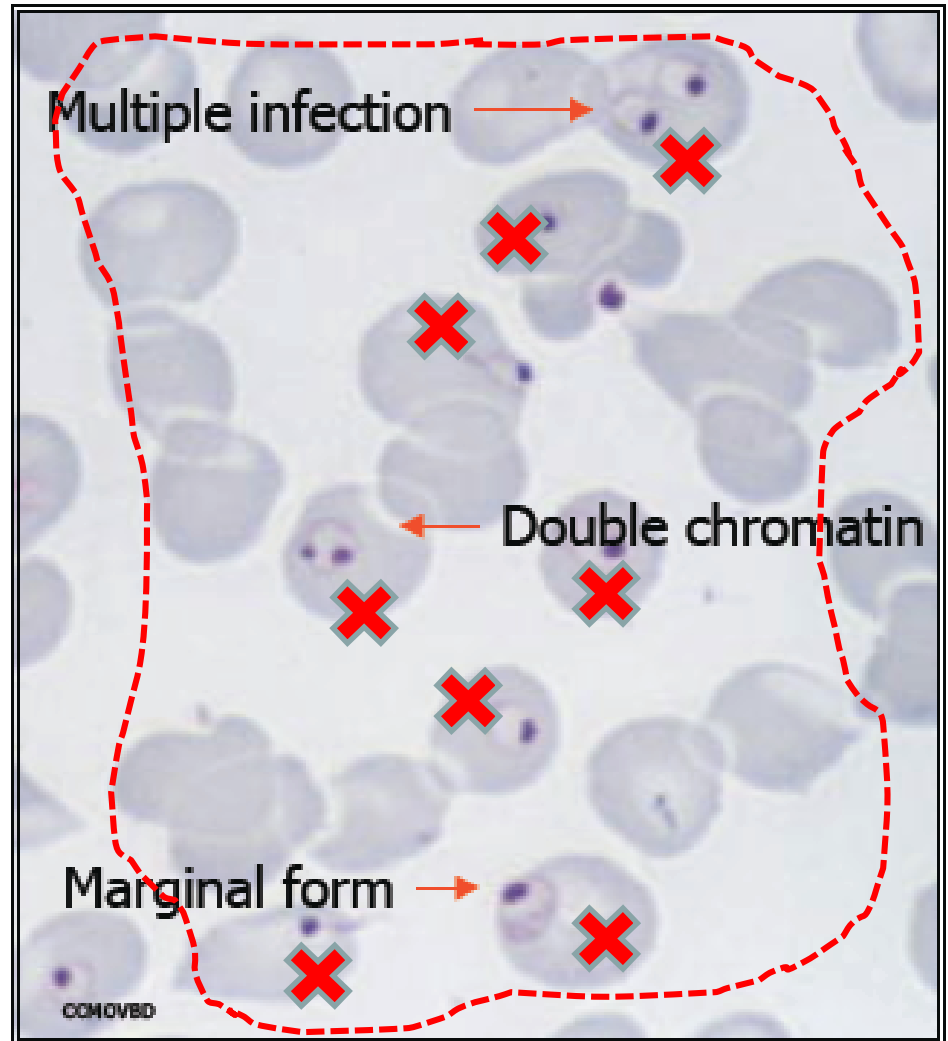
- What percent parasitemia?
- Count only whole cells in the field
- Don't count multiple infected cells



- $8/25 = 32\%$

This talk

<https://goo.gl/wzMwKI>





Enjoy PEI!