ECCMID 2019
Clinical Grand Rounds

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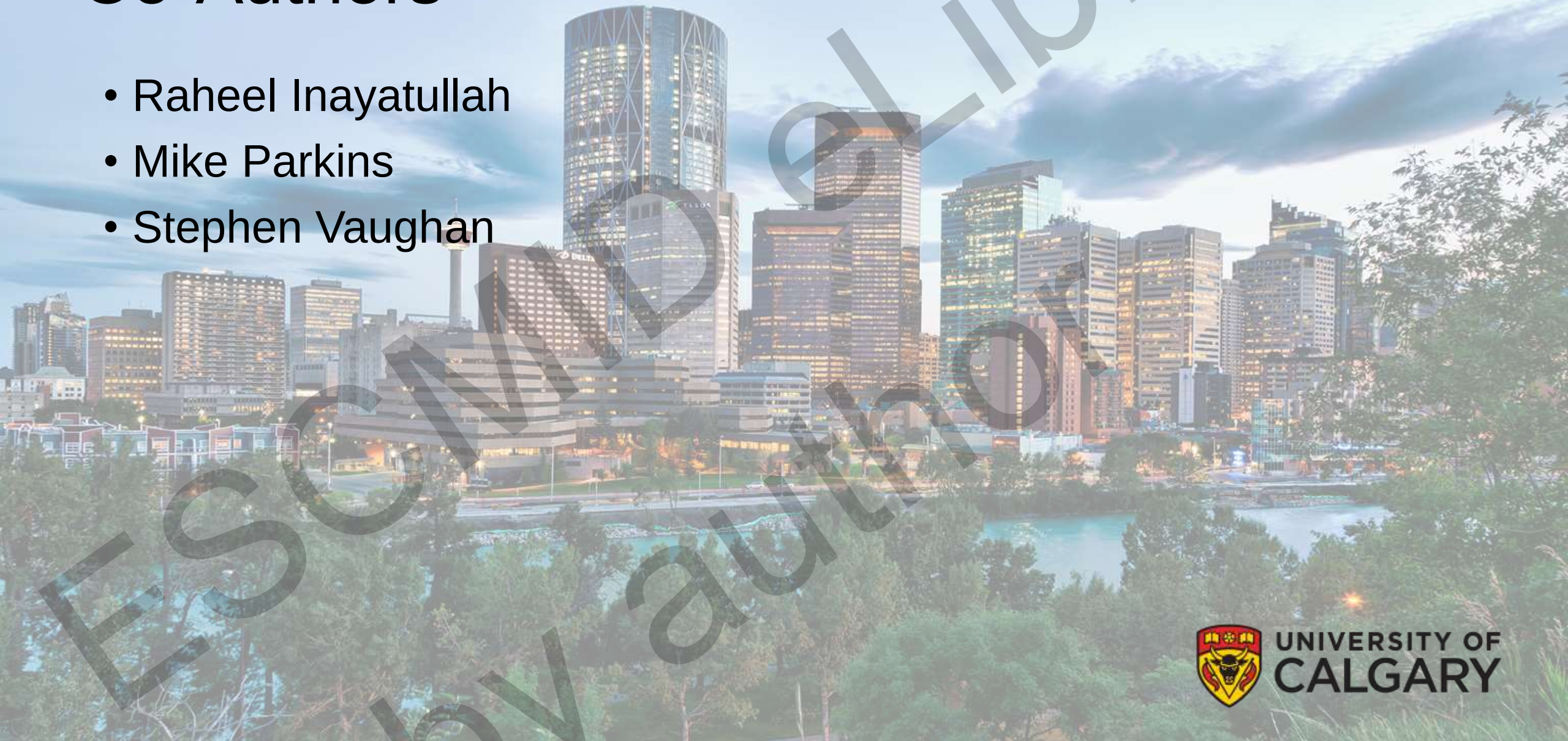

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Case

30 year old female, gravida 1, para 0 at 17 weeks gestation

Presented to Calgary hospital with 4 days of subjective fever, chills and emesis

Unremarkable prenatal course including negative HIV serology

Travel History

Prior to symptoms, had spent 5 days in a well-kept air-conditioned home in Vernon, British Columbia

Family hiking trip with preventative measures undertaken (long sleeved clothing, bug spray)

No swimming or exposures to water

No recollection of lesions from tick, insect or rodent bites

No other relevant exposures or notable epidemiological history

Physical Examination

Temperature: 38.9℃

Blood pressure: 85/52

Heart Rate:128 beats per minute

O_2 saturation: normal

No focus of infection on examination

Investigations

	Result	Reference Range	Units
Hemoglobin	78	120 - 160	g/L
White Blood Cells	3.4	4 - 11	x 10^9 /L
Lymphocytes	0.1	1 – 3	x 10^9 /L
Platelets	27	150 - 400	x 10^9 /L
Creatinine	80	60-110	mmol/L
Lactate	4.3	0 – 2.0	mmol/L
Liver enzymes	Normal		
Prothrombin Time	Normal		
Arterial blood gas	Metabolic acidosis (pH 7.21)		
Chest X-Ray	Normal		

ECCMID Panel – Differential diagnosis? Empiric therapy?

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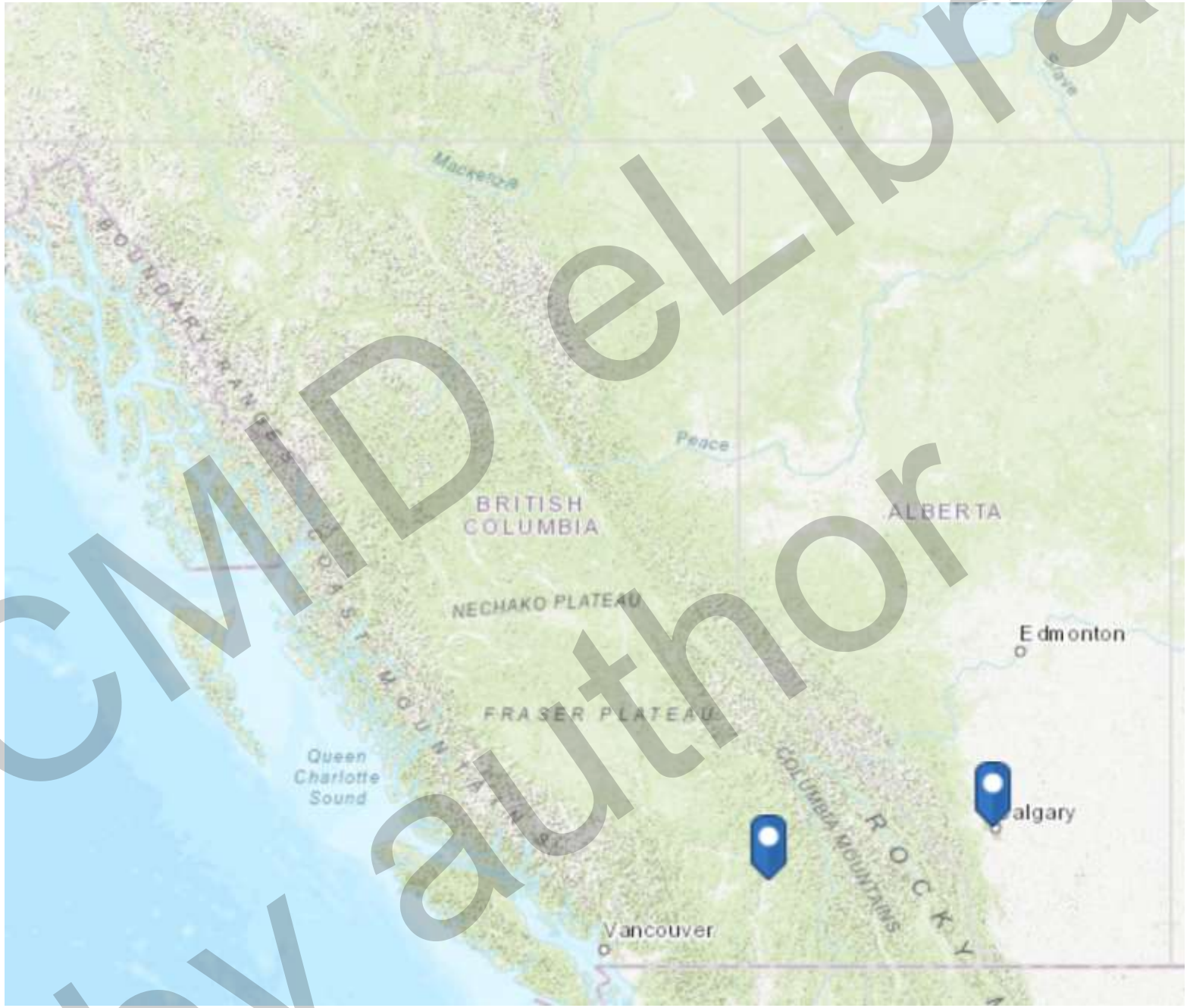


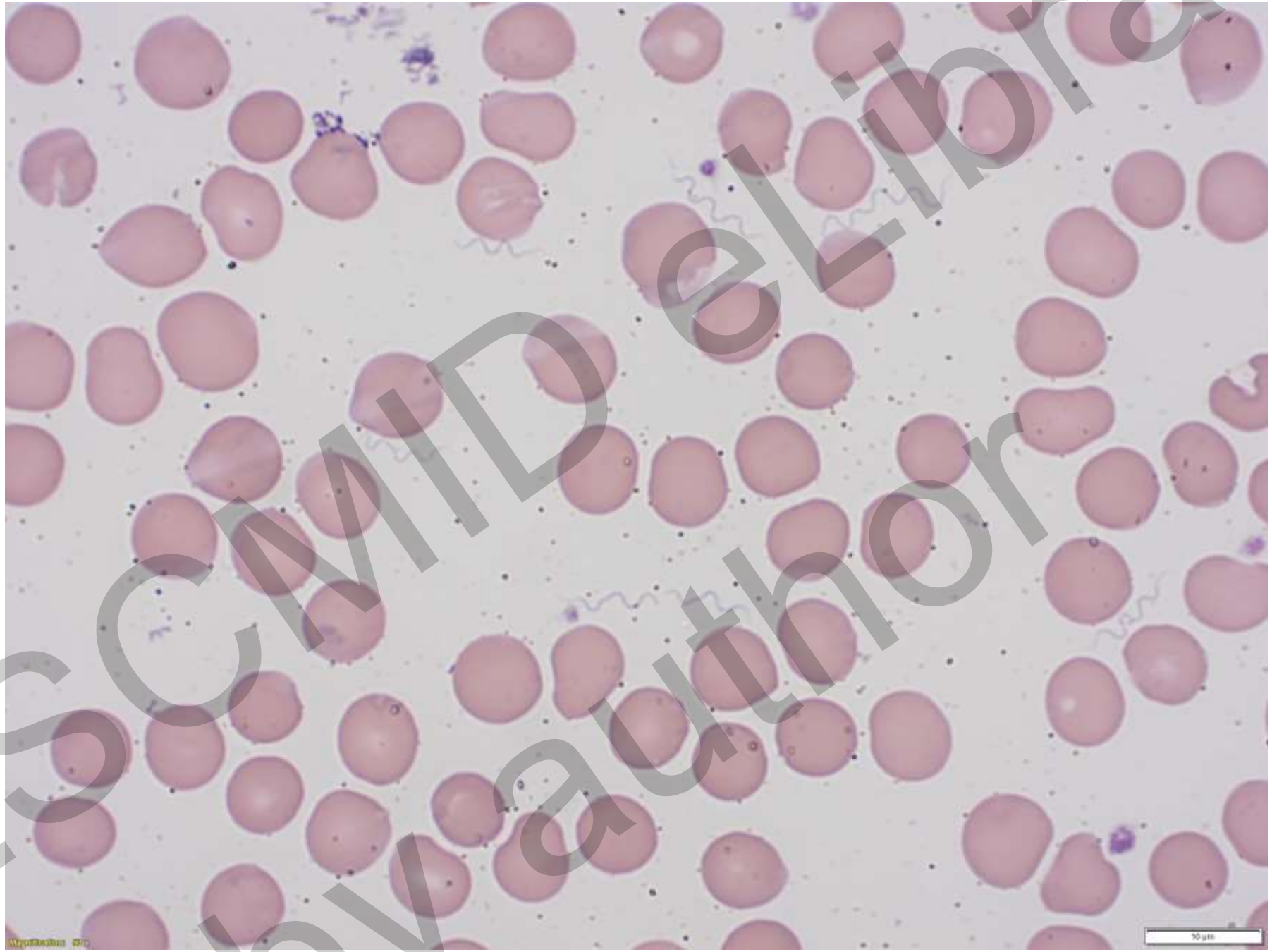
With additional information…

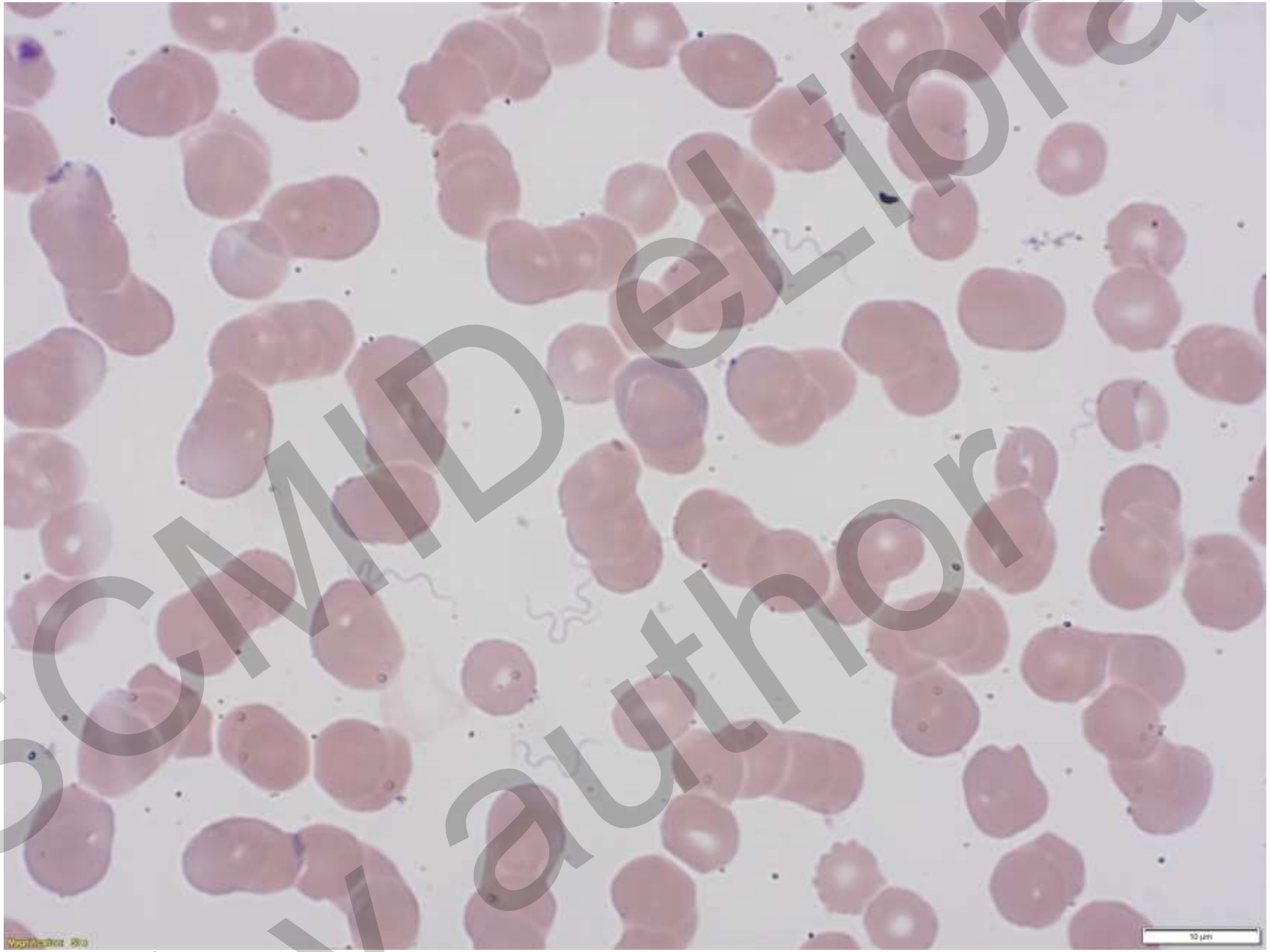
Started on Penicillin G at 4 million units every 4 hours intravenously

Two hours after first dose, developed chills and worsening hypotension (Blood pressure = 70/50) despite six liters of fluid resuscitation

Transferred to Intensive Care Unit for monitoring – no vasopressor support required

ECCMID Panel – changes to plan?





ECCMID Panel: Differential diagnosis for spirochetemia in this patient?

Treatment?

Spirochetemia on blood smear

Treponema pallidum subspecies

Borrelia burgdoferi sensu lato

Tick borne relapsing fever

Louse borne relapsing fever

Leptospira species

Rat-bite fever

Brachyspira species

Course in Hospital

Treated presumptively for tick borne relapsing fever with Penicillin G based on history and presence of spirochetemia prior to polymerase chain reaction

Hypotension resolved within one day and pancytopenia resolved in one week

Fetal biophysical profile was normal

Polymerase chain reaction confirmed *Borrelia hermsii* as causative pathogen

Tick borne relapsing fever (TBRF)

Infection of *Borrelia* species acquired through a painless bite from the night-biting *Ornithodoros* tick

Characterized by recurrent 3-day fevers punctuated by week-long periods of being afebrile

Episodes of fevers and tachycardia (chill phase) followed by hypotension and drenching sweats (flush phase)

Pregnant hosts have higher spirochete levels and more severe symptoms than non-pregnant hosts

CDC 2018

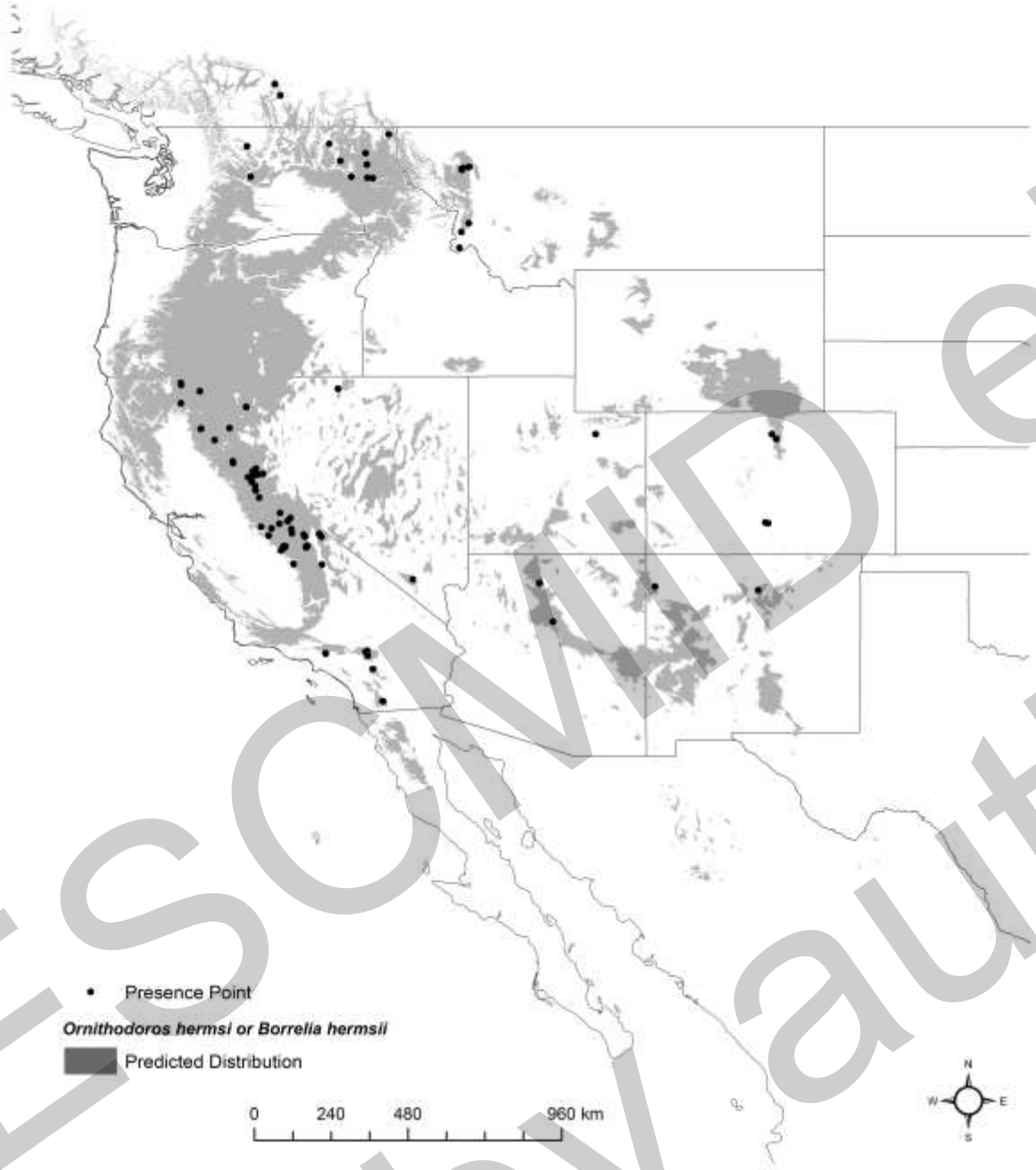
Ornithodoros hermsi

Night-biting soft tick found in Southern British Columbia and Northwestern United States with preference for coniferous forests at 450 to 2450 meters

Reside in nests of rodent reservoirs and feed on rodents (or in their absence, humans)

Unusual to be found in more humid and lower elevation environments (like Vernon)

Dworkin Infect Dis Clin North Am 2008



Sage PLoS Negl Trop Dis 2017

Treatment Implications

β-lactams are used in place of doxycyline in pregnancy owing to teratogenicity of tetracyclines

Jarisch-Herxheimer reaction - characterized by chills, fevers and hypotension occur upwards of 50% of patients treated for TBRF, regardless of agent used

Thrombocytopenia associated with acute TBRF poses risks of preterm labor and spontaneous abortion

Cases of placental transmission to the neonate have also been reported

Hussein CMAJ 2014
Butler AJTMH 2017

Summary

1. TBRF represents a potentially life-threatening illness in pregnant individuals.
2. Spirochetemia on blood smear may only be identified during febrile episodes.
3. While doxycyline is usually the drug of choice, potential for teratogenicity favors usage of β-lactams in pregnancy.
4. The Jarisch-Herxheimer reaction is commonly associated with treatment of TBRF.
5. Geographic variation in infectious disease epidemiology emphasizes need for disease surveillance.