

November 2019

Human Plague Update

Recent cases of pneumonic and bubonic plague in China have raised awareness of this infection and its causative bacteria, *Yersinia pestis*. *Y. pestis* is a gram-negative coccobacillus that has caused three major pandemics of plague. The infection is primarily spread through rodent-associated fleas. Humans can become infected through flea bites, direct handling of infected animal tissues, or through inhalation of respiratory secretions of infected animals. Human to human transmission is possible in cases of pneumonic plague.

A timely article in Emerging Infectious Diseases (www.cdc.gov/eid, December 2019, 25:12;2270-2272) describes the role of animal exposure in U.S. plague cases reported between the years of 1970 and 2017. During this time frame, 482 human plague cases were reported, of which 258 had an identifiable animal exposure. The majority of animal exposures were to domestic animals that had potential for infection either through predation of rodents (including rats, squirrels, prairie dogs, gophers or rabbits) or through flea infestations. Veterinarians and veterinary technicians are at highest risk of occupational exposure. The states of New Mexico, Colorado, and Arizona have the highest number of reported human plague cases.

Left untreated, the case fatality rate is approximately 50% in cases of bubonic plague and near 100% in septicemic or pneumonic plague. The vast majority of U. S. plague cases are bubonic (~75-80%), with an incubation period of 2 to 7 days following exposure. Cases of suspected or confirmed plague are reportable

immediately on first suspicion to public health authorities.

Rituximab (anti-CD20) Panel

CD20 is a transmembrane protein universally expressed on normal B cells, excluding stem cells, pro-B cells, and plasma cells. Rituximab is a human/murine, chimeric anti-CD20 monoclonal antibody with established efficacy, and a well-defined favorable safety profile in patients with different types of CD20-expressing B cell non-Hodgkin lymphoproliferative malignancies, including indolent and aggressive forms. Since its first approval 20 years ago, the success of rituximab has led to the development of other anti-CD20 monoclonal antibodies in recent years e.g., obinutuzumab, ofatumumab, veltuzumab, and ocrelizumab.

B cells are considered the key participants in autoimmune diseases due to production of autoantibodies. For management of autoimmune disease, therapies targeting B cell depletion have gained enormous popularity. B cell depletion is known to produce a rapid clinical remission in approximately 70-80% of patients. Rituximab, an immune modulating agent with biological activity across many autoimmune conditions, has been FDA approved for rheumatoid arthritis, granulomatosis with polyangiitis (Wegner's Granulomatosis), microscopic polyangiitis, and pemphigus vulgaris. Benefits from a single rituximab infusion may usually last 9-18 months.

For monitoring rituximab therapy in patients with autoimmune disorders, a flow cytometry based test is available and performed Monday - Friday at Saint Luke's

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Hospital. Specimen requirement includes 4 ml peripheral blood in green top tube (sodium heparin) received within 72 hours of collection. Following table shows the markers used (B cell markers including CD19, CD20, and CD22, and T cell markers including CD3) and reference ranges -

Markers	Reference Range
CD19	4 - 23%
CD20	3 - 21%
CD22	6 - 23%
CD3	55 - 91%

Respiratory Season 2019-20

Influenza is increasing across the U.S. this season, with many states already reporting local or regional activity and three states reporting widespread illness (cdc.gov). Multiple non-influenza respiratory viruses are circulating, and currently far outnumber influenza. A tally of results from respiratory virus panels performed by Saint Luke's Microbiology since November 1 show that rhinovirus is the predominant virus detected, followed by human metapneumovirus. Parainfluenza (types 1 & 4) and Mycoplasma are third & fourth most common, respectively. During the first half of November, only 4 influenza A and 3 influenza B tests have been positive. Four RSV cases have been detected. A summary of respiratory PCR testing from November 1 through November 15, 2019 is as follows:

Rhinovirus	64
Mycoplasma	9
Adenovirus	3
Parainfluenzae	10 (6 subtype 1, 4 subtype 4)
Human Metapneumovirus	13
RSV	4
Coronavirus	2 (1 229E1, 1 NL631)
Influenza A	4 (all H3)
Influenza B	3

Saint Luke's Laboratories offer a variety of test options for detection of influenza and RSV. Rapid antigen testing is performed by all testing sites. A combination influenza A/B PCR is now available on-site at Saint Luke's East, Saint Luke's North, and Saint Luke's South as well as through the central Microbiology laboratory at Saint Luke's Hospital. RSV PCR testing is available at these test sites as well, and can be ordered separately from, or in combination with Flu PCR. Inpatients with negative rapid influenza antigen test results should have Flu PCR testing performed prior to discontinuing appropriate isolation precautions. Combination testing for influenza and RSV should be considered for both children and elderly patients. Specimens can also be sent to the central Microbiology laboratory at Saint Luke's Hospital for respiratory panel PCR testing. Optimal utilization of the multi-organism panel is for severely ill, immunocompromised, or transplant patients.

Test Name	Detects	Specimen types	Transport
Flu AB Ag	Influenza A & B	NP/nasal swab Nasal wash	NP swab in UTM or M6, or E swab transport system
Flu PCR	Influenza A & B	NP/nasal swab Nasal wash	NP swab in UTM
Flu RSV PCR	Influenza A, B, & RSV	NP/nasal swab	NP swab in UTM
Respiratory panel PCR	7 respiratory viruses, Bordetella, Mycoplasma, Chlamydia	NP/nasal swab Nasal wash Bronchoscopy wash/lavage	NP swab in UTM or M6

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