

# MERS-CoV & other viruses

Dr. MONA BADR

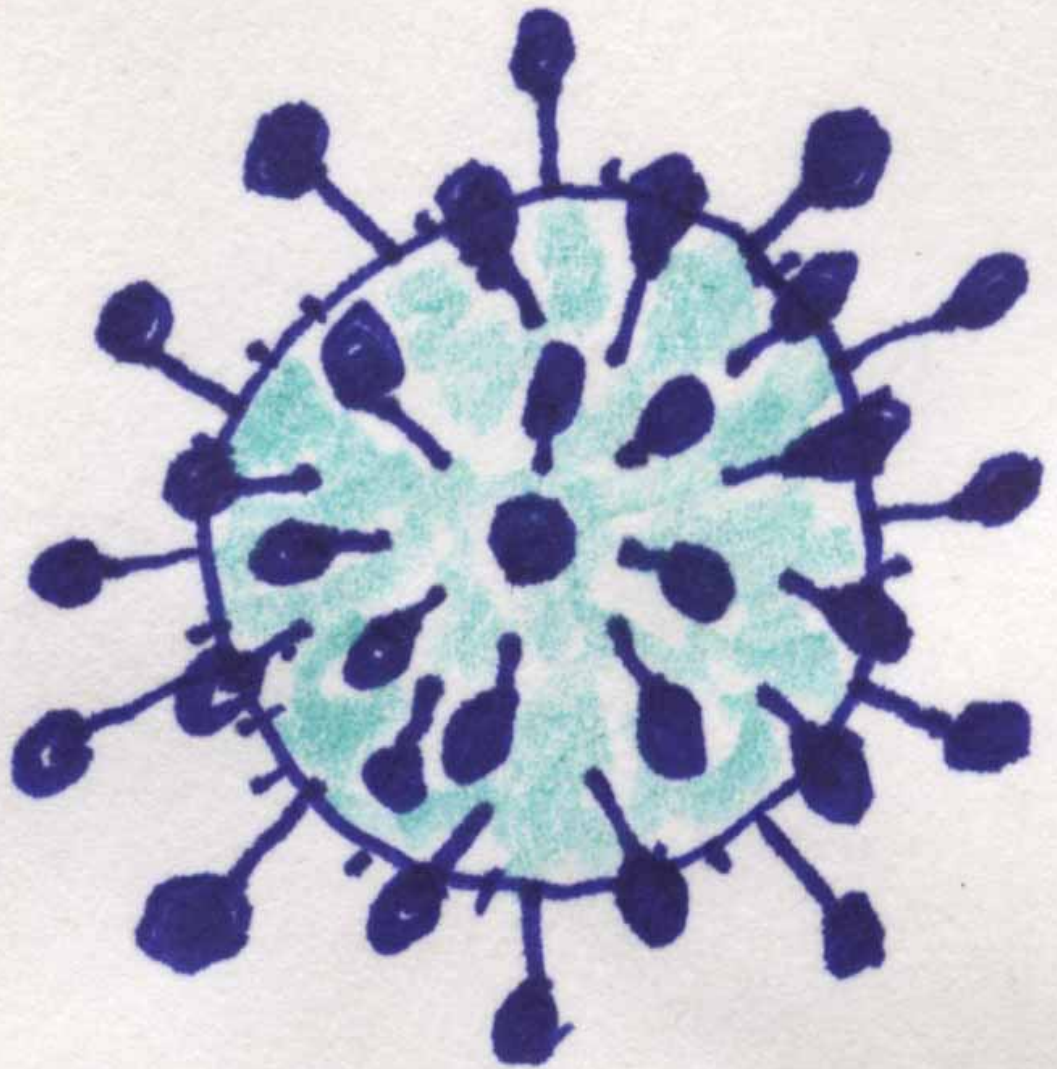
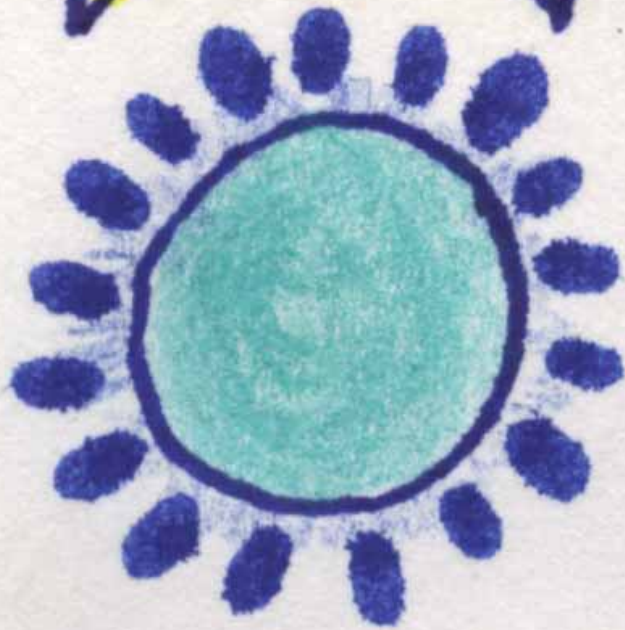
Assistant Professor

College of Medicine & KCUH

# Objectives

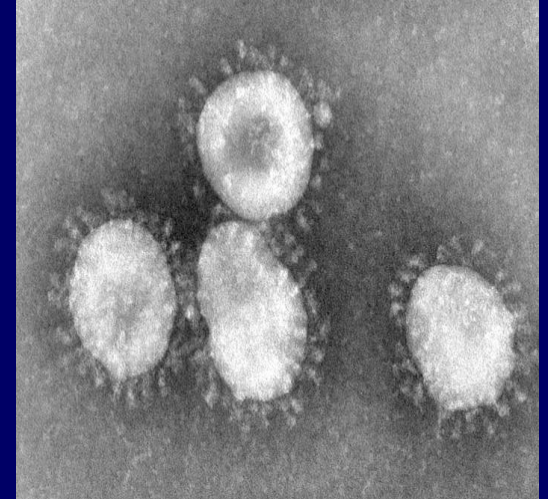
- Characteristics of MERS-CoV, Rhinovirus, Coxsackieviruses & other Picornaviruses, Adenovirus, Epstein – Barr virus.
- Mode of transmission
- Clinical features
- Lab diagnosis
- Treatment & prevention

# Human Coronavirus 229E



# Coronavirus

- **Family:** *Coronaviridae*.
- **Structural features:** Enveloped virus with + polarity ss-RNA genome.
- **Transmission:** Inhalation of infectious aerosol droplets.
- **Clinical symptoms:** The 2<sup>nd</sup> cause of common cold.
- Coronavirus also causes zoonotic disease (the virus is capable of infecting humans and animals including birds, camels, pigs and others).





# SARS-CoV

## *Severe Acute Respiratory Syndrome (SARS)*

- In winter of 2002, a new respiratory disease known as (SARS) emerged in China after a new mutation of coronavirus.
- The disease spread worldwide due to travelling.
- The animal reservoir may be rats or cats.
- SARS starts with high fever followed by cough with difficulty in breathing (atypical pneumonia).
- Associated with high mortality due to respiratory failure.

# MERS-CoV

Middle East Respiratory Syndrome (MERS) is viral respiratory illness first reported in Saudi Arabia in 2012. It is caused by a coronavirus.

➤ **Epidemiology:** So far, all the cases have been linked to countries in and near the Arabian Peninsula.

- Highly infectious.
- Incubation period 2-14 days.

➤ **Transmission:**

This virus spread from ill people to others through close contact. There is no evidence of sustained spreading in community settings. Evidence also suggested that the virus can be acquired from direct close contact with animals.

# Coronavirus

In September 2012 ,a case of novel coronavirus infection was reported involving a man in **Saudi Arabia** who was admitted to a hospital with pneumonia and acute kidney failure.

This virus has been named as Middle East Respiratory Syndrome- CoronaVirus (MERS-CoV) ,virus closely related to several **bat** coronaviruses.

MERS-CoV infected several human cells , including lower but not upper respiratory, kidney ,intestinal, and liver cells.



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kamel





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ENGLISH

الإرشادات الصحية  
الوسائل التوعوية  
الأسئلة الشائعة  
المعتقدات الخاطئة  
الإحصائيات والبيان اليومي  
الأخبار الصحفية  
إرشادات الكادر الصحي

تنبهات الصحة العامة

مركز القيادة والتحكم > الإحصائيات والبيان اليومي

### الإحصائيات والبيان اليومي

## عدد حالات الإصابة بفيروس كورونا

حسب الساعة 12 ظهراً بتاريخ 16 جمادى الأولى 1438 هـ

\* منذ عام 1433 هـ الموافق 2012م  
توفي منهم 648 حالة  
(تعمدهم الله بواسع رحمته)

إجمالي  
حالة 1510  
+35 حالات  
بدون أعراض

901 حالة  
تماثلت للشفاء

8 حالة تحت  
العلاج

توضيح: يرجى ملاحظة أن العدد الإجمالي للحالات معرض للغير بسبب إجراءات إعادة التصنيف، والتحقق في عدد الحالات بأثر رجعي، وتجمع البيانات الخاصة بالحالات والنتائج المختبرية ونتائج المراقبة المعززة.

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للمزيد من المعلومات حول المركز



إرشادات الكادر الصحي



معلومات القطاعات

فيروس  
كورونا

الإرشادات الصحية



16 جمادى الأولى 1438

15 جمادى الأولى 1438

14 جمادى الأولى 1438

« (الصحة): تسجيل حالي إصابة واحدة بفيروس (كورونا)

« (الصحة): لا توجد حالات إصابة جديدة

« (الصحة): تسجيل حالة إصابة واحدة بفيروس (كورونا)



ENGLISH

الإرشادات الصحية | الوسائل التوعوية | الأسئلة الشائعة | المتعدّات الخاطئة | الإحصائيات والبيانات اليومية | الأخبار الصحفية | إرشادات الكادر الصحي



تبيهات الصحة العامة

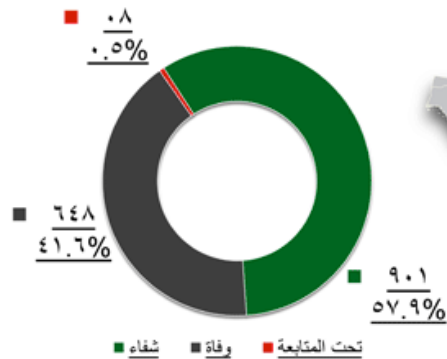
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(الصحة): تسجيل حالي إصابة واحدة بفيروس (كورونا)

17/05/1438

متلازمة الشرق الاوسط - كورونا :  
التحديث اليومي

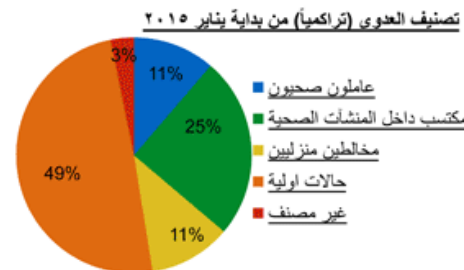
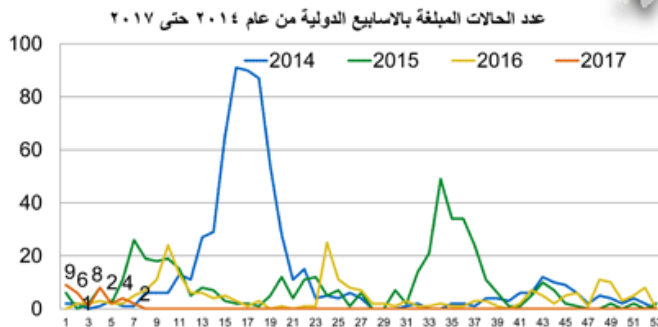
مآل الحالات المؤكدة منذ عام ١٤٣٣ هـ



التاريخ: ١٦ جمادى الأولى ١٤٣٨ هـ

| المجموع              | ? | 🐪 | 🚫 |
|----------------------|---|---|---|
| حالات باعراض مرضية   | ١ | ١ | ٠ |
| بدون اعراض مرضية     | ٠ | ٠ | ٠ |
| الوفيات خلال ٢٤ ساعة | ٠ | ٠ | ٠ |
| الشفاء خلال ٢٤ ساعة  | ١ | ٠ | ٠ |

🐪 = توجد مخالطة مباشرة أو غير مباشرة مع الإبل  
🚫 = لا توجد مخالطة مع الإبل  
? = تحت التقصي



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لمزيد من المعلومات حول المركز



إرشادات الكادر الصحي



معلومات القطاعات

فيروس  
كورونا

الإرشادات الصحية



آداب السعال والعطاس



فيديو - معلومات تمك عن كورونا

### ➤ **Risk group:**

- Individuals with weakened immune systems
- People with pre-existing medical conditions (or comorbidities) such as diabetes, cancer, and chronic lung, heart, and kidney disease.

### ➤ **Clinical Features:**

- Symptoms may include fever, cough, and shortness of breath.
- Some people also had gastrointestinal symptoms including diarrhea and nausea/vomiting.
- Some infected people had mild symptoms (such as cold-like symptoms) or no symptoms at all and they recovered completely.
- Most people with comorbidities developed severe acute respiratory illness.

### ➤ **Complications:**

- Severe complications include pneumonia and kidney failure. About 30% of people infected with MERS died.

➤ **Lab diagnosis:** Detection of the viral nucleic acid (NA) by PCR.

**Other methods:** Isolation of the virus from NPA by cell culture.

➤ **Treatment:** No specific antiviral treatment. For severe cases, current treatment includes care to support vital organ functions.

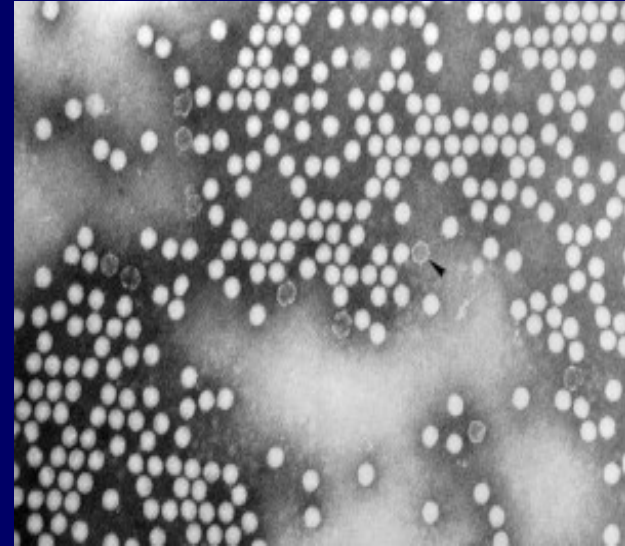
➤ **Prevention:**

People are advised to protect themselves from respiratory illnesses by taking everyday preventive actions:

- Wash hands often with water and soap or use an alcohol-based hand sanitizer.
- Cover nose and mouth with a tissue when cough or sneeze.
- Avoid touching eyes, nose and mouth with unwashed hands.
- Avoid personal contact with sick people.
- Clean and disinfect frequently touched surfaces such as toys and doorknobs.

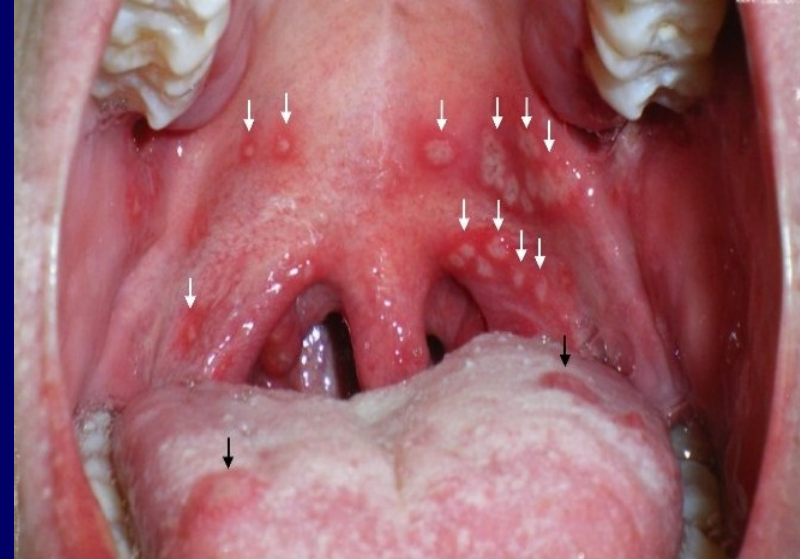
# Rhinovirus

- **Family:** *Picornaviridae*.
- **Structural features:** Non-enveloped virus with + polarity ssRNA genome, more than 100 serotypes available.
- **Transmission:** Inhalation of infectious aerosol droplets.
- **Clinical symptoms:** The 1<sup>st</sup> cause of common cold. The main symptoms of common cold are sneezing, clear watery nasal discharge with mild sore throat, and cough.
- **Lab diagnosis:** routine testing by detection of the viral NA from NPA using PCR.
- **Treatment and prevention:** Usually self-limiting disease, no specific treatment, and no vaccine available.



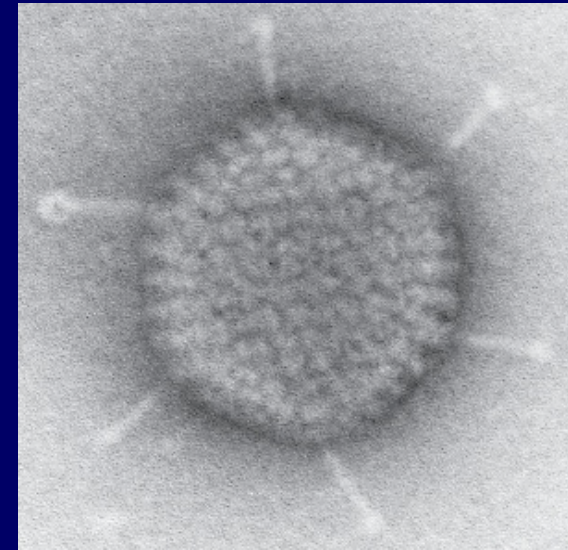
# Coxsackieviruses & other Picornaviruses

- **Family:** *Picornaviridae*.
- **Structural features:** Non-enveloped virus with + polarity ssRNA genome
- Coxsackieviruses group A & B,
- Echovirus, Enteroviruses.
- **Transmission:**  
Inhalation of infectious aerosol droplets.
- **Clinical symptoms:**  
Coxsackieviruses cause herpangina and pharyngitis  
Echovirus & other Enteroviruses cause respiratory symptoms
- **Lab diagnosis:** routine testing by detection of the viral NA from NPA using PCR.
- **Treatment and prevention:** Usually self-limiting disease, no specific treatment, and no vaccine available.



# Adenovirus

- Family: *Adenoviridae*.
- **Structural features:** Non-enveloped virus with **ds-DNA genome**.
- **Pathogenesis:** Adenovirus infects epithelial cell lining respiratory tract, conjunctiva, urinary tract, gastrointestinal tract and genital tract.
- **Clinical syndrome:**
  1. Pharyngitis and tonsillitis.
  2. Pharyngoconjunctivitis
  3. Conjunctivitis.
  4. Pneumonia: in preschool children.
  5. Gastroenteritis.
  6. Acute hemorrhagic cystitis.
  7. UTI (Cervicitis and urethritis).
- **Lab diagnosis: routine testing by** direct detection of the Ag from NPA by direct IFA. **Other detection methods:** tissue culture, PCR.
- **Treatment and prevention:** No specific treatment or vaccine.





# Epstein – Barr Virus (EBV)

- **Infectious mononucleosis**
- **Family:** *Herpesviridae*
- **Structure:** Enveloped , icosahedral dsDNA virus
- It is lymphotropic.
- It has oncogenic properties;  
Burkitt's lymphoma  
Nasopharyngeal carcinoma



# Epidemiology

- Distribution: worldwide (Mainly in teenagers & young adults)
- Transmission:
  - Saliva [kissing disease]
  - Blood [rarely]
- Age:
  - Socio-economic status: SE
  - Low SE class → early childhood
  - High SE class → adolescence

# Clinical Features:

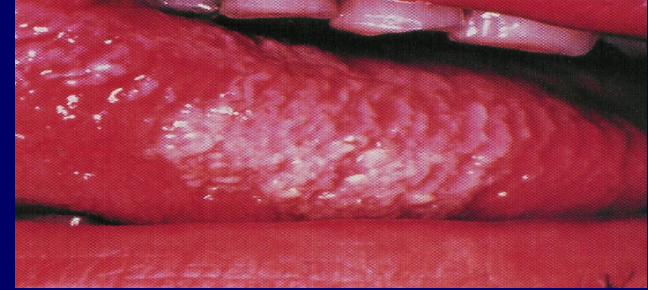
## Immunocompetent host

- ❖ Asymptomatic
- ❖ **Infectious mononucleosis**  
[or glandular fever]
  - IP = 4-7 weeks
  - Fever, sore throat, tonsillitis, pharyngitis, malaise, hepatosplenomegaly & abnormal LF, hepatitis.
  - Complications  
(acute airway obstruction, splenic rupture, CNS inf)



# Immunocompromised host

- Lymphoproliferative disease ( LD)
- Oral hairy leukoplakia (OHL)



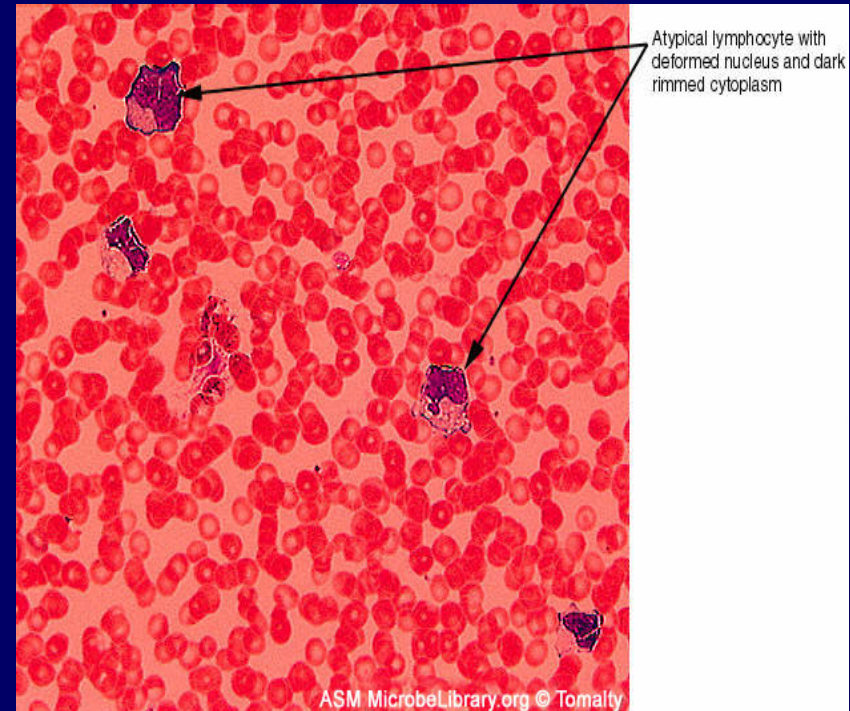
## Diagnosis:

### Hematology:

- ↑ WBC

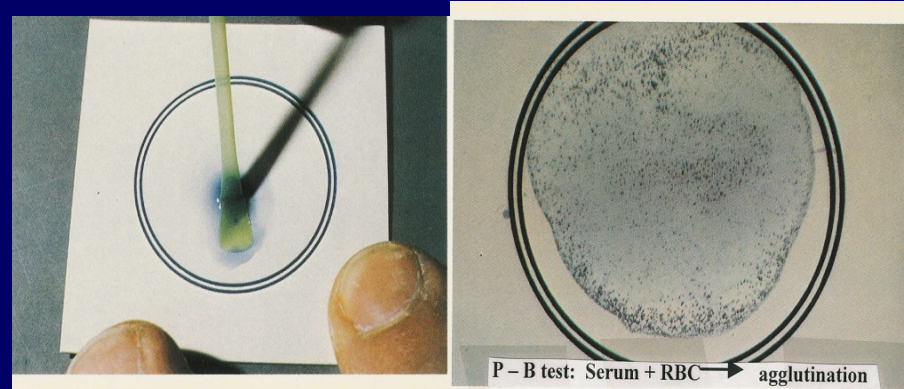
lymphocytosis

**(Atypical lymphocytes)**



# Diagnosis:

- **Serology tests**
- Non-specific AB test ;
  - Heterophile Abs +ve
  - Paul-Bunnell or monospot test



- **EBV-specific AB test:** Detection of IgM Abs to EBV capsid antigen by ELISA

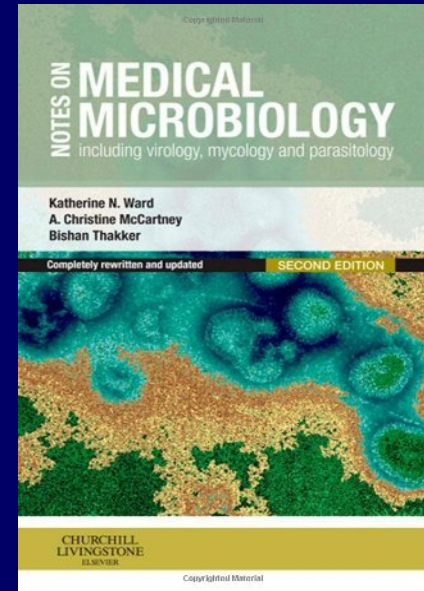
# Management:

- **Treatment:**
  - There is no treatment for Infectious mononucleosis
- **Prevention:**
  - No vaccine

# Reference books

## Notes on Medical Microbiology

By; Katherine N. Ward, A. Christine McCartney, and Bishan Thakker.  
(2009)



## Human Virology

By; Leslie Collier and John Oxford.  
(2006)

