

Public lectures  
**My health, my decisions**

**ANTIBIOTICS, A DECISION TO SHARE**



Canada Research Chair in Shared Decision Making and Knowledge Translation  
 Chaire de recherche du Canada en décision partagée et application des connaissances

Centre intégré  
 universitaire de santé  
 et de services sociaux  
 de la Capitale-Normandie  
 Québec

UNITÉ DE  
 SOUTIEN  
 SRAP QUÉBEC

Institut universitaire  
 de première ligne  
 en santé et services sociaux



Faculté de médecine  
 Département de médecine familiale et de médecine d'urgence



L'Institut Canadien  
 de Québec

Bibliothèque  
 de Québec  
 Découvrir.  
 Se divertir.  
 Réviser.

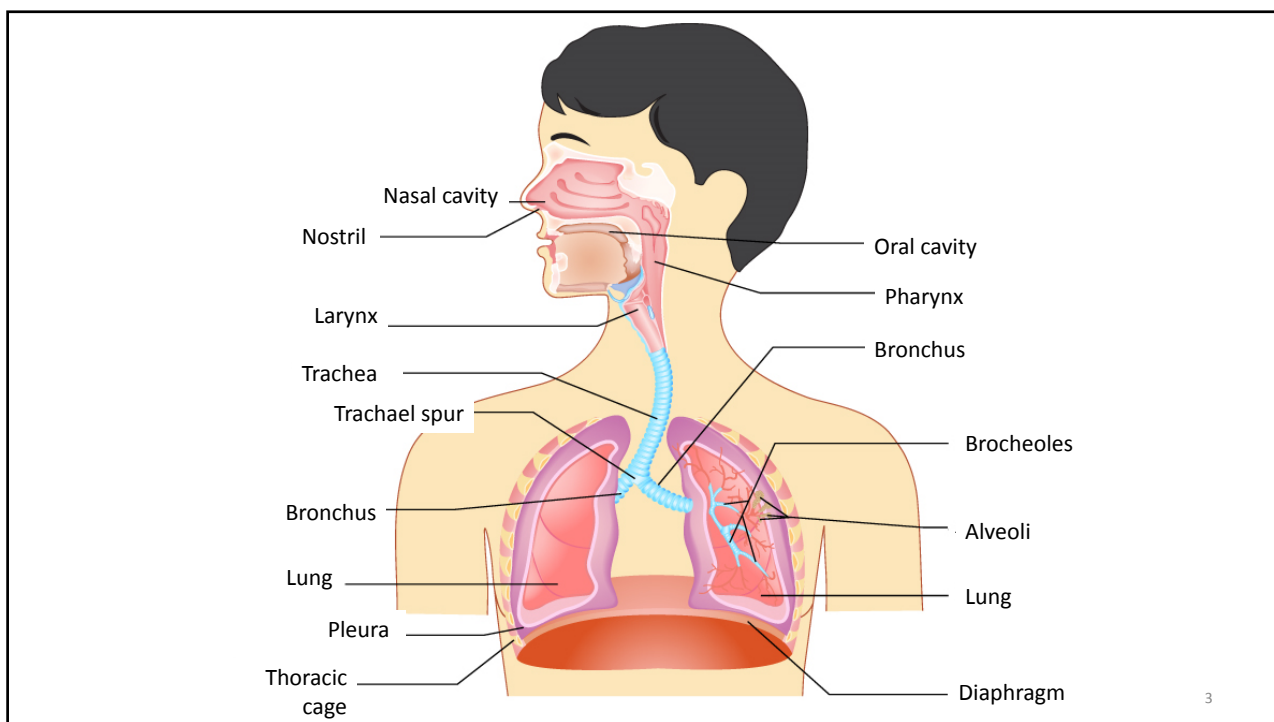
1



# Introduction

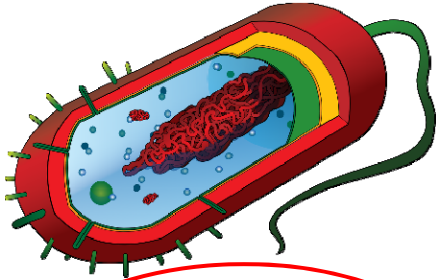


2



## What causes respiratory tract infections?

- Bronchitis is nearly always caused by a virus (more than **9/10**)
- Pharyngitis (sore throat) is often caused by a virus (**8/10**)
- Acute otitis media (ear infection) is often caused by a bacteria (**9/10**)



**Bacteria**

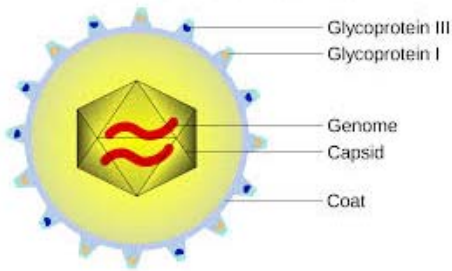
- Has a cell
- Is sensitive to antibiotics

Eg: streptococcus, pneumococcus

**Virus**

- No cells (1000 times smaller than bacteria!)
- Not sensitive to antibiotics

Eg: rhinovirus, adenovirus, coronavirus



## When should I see the doctor?

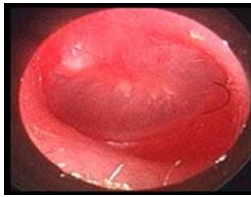
- *Info santé* helpline: **811**
- *Santé mieux-être* website: [sante.gouv.qc.ca/en](http://sante.gouv.qc.ca/en)
- *From Tiny Tot to Toddler*
  - Fever (rectal  $\geq 38.1^\circ$ ) in babies under 6 mths
  - Fever for 3 days



# Eardrums and otitis

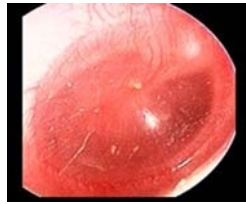
- If it's painful:**

Inflammation  
and fluid



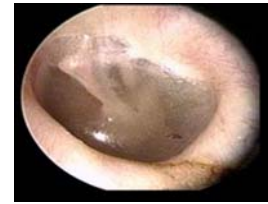
99% chance of  
bacteria

Inflammation  
but no fluid



60% chance of  
bacteria

No inflammation,  
no fluid



3% chance of  
bacteria

- If it's not painful: the chances are different!**

7

## ACUTE RHINOSINUSITIS

To differentiate patients with an ACUTE RHINOSINUSITIS due to a bacteria from those whose ACUTE RHINOSINUSITIS is due to a virus

### STEP 1

Tick all the key symptoms and signs identified in your patient with symptoms of rhinosinusitis

#### INITIAL QUESTION

Duration of symptoms

< 10 days  ≥ 10 days

#### ADDITIONAL QUESTIONS

- Double sickening (worsening after improving)
- Colored nasal discharge
- Facial/sinus pain
- Maxillary tooth pain
- No response to decongestants

#### ADDITIONAL SIGNS

- Purulent discharge in nasal cavity (middle meatus) and/or throat
- Sinus pain on **one side**
- Abnormal transillumination (**one side**)

### ALERTS

- Persistent high fever
- Severely ill
- Orbital swelling or erythema
- Diplopia, proptosis or other neurologic signs

### STEP 2

Encircle the clinical probability (%) of a bacterial acute rhinosinusitis according to signs and symptoms of patients assuming a prevalence of 15%

| Additional symptoms/signs | Additional symptoms/signs |           |
|---------------------------|---------------------------|-----------|
|                           | <10 days                  | >10 days* |
| 4+                        | 30%                       | 95%       |
| 3                         | 15%                       | 75%       |
| 2                         | 5%                        | 50%       |
| 1                         | 2%                        | 25%       |
| 0                         | 1%                        | 5%        |

\*Adults 7-10 days; children 10-14days

## Whatever kind of bug it is (virus or bacteria), on average...

- With bronchitis, the cough will disappear in **24 days**
- With otitis (ear), the pain will disappear in **3 days**
- With pharyngitis (throat), the pain will disappear in **5 days**
- With sinusitis, the congestion will disappear in **10 days**

*Supportive treatment (e.g. Tylenol) can help*

9

## Antibiotics



10

## A leap forward

**1920:** In Quebec, one in three people died of an infectious disease (germ-caused)

**2016:** less than 1% of deaths are due to germs

**1920:** A quarter of newborns died before they were year old

**2016:** about 1 out of 250 die.



Pediatric ward, Hôtel Dieu de Québec, ca. 1930  
(Archives du monastère des Augustines)

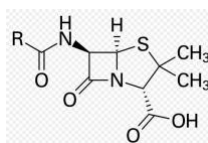
**What made the difference? Hygiene, vaccines et antibiotics!**

11



## Then and now

1928: Alexander Fleming discovered penicillin



1944: streptomycin (1st antibiotic that worked against tuberculosis)

1950-80: erythromycin, vancomycin, fluoroquinolones...

Since then, different formats but hardly any new antibiotics

**About 30 antibiotics are commonly used in Canada**

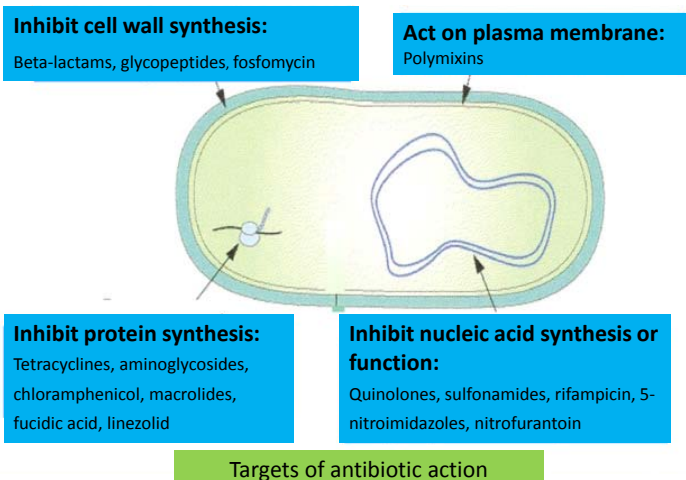
12

## What are antibiotics used for?

- To fight infections **caused by bacteria**, for example:  
Syphilis, gonorrhoea, cholera, plague, E. coli diarrhea, C. difficile, flesh-eating bacteria, bacterial urinary infection, bacterial meningitis, streptococcal pneumonia ... and bacterial respiratory infections
- Main antibiotics used against bacterial upper respiratory tract infections:  
Amoxicillin, clarithromycin, azithromycin, erythromycin, penicillin
- Antibiotics used against viral infections: **NONE!**

13

## How do antibiotics work?



**Only on bacteria!**

14

## Risks and side-effects

- Severe allergies to antibiotics: 4-15/100,000
- Side-effects (vomiting, diarrhea, rashes... ): 5/100
- Viruses and antibiotics don't always get along: this rash was from using ampicillin for mononucleosis



15

## Over-prescribed medications

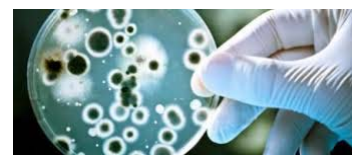
- **More than 2/3** of acute respiratory infections are caused by viruses.
- Yet 2/3 of these infections are treated with antibiotics!
- **One of three Canadians** was prescribed an antibiotic for an acute respiratory infection last year.
- Canadians take **250 tons** of antibiotics per year.

16





## Why?



- Everyone is **afraid** of germs, including doctors!
- People think that **the only thing** that works is ... antibiotics!
- Doctors and patients tend to overestimate the benefits of antibiotics and underestimate the risks



## What is antibiotic resistance?

- Bacteria become resistant to antibiotics, so the antibiotics can no longer kill them.
- People transmit this resistance to their descendants.
- A natural adaptation process, but magnified by bad use of antibiotics.
- Resistance can be transmitted from one bacteria to another, **even when they're not of the same type!**

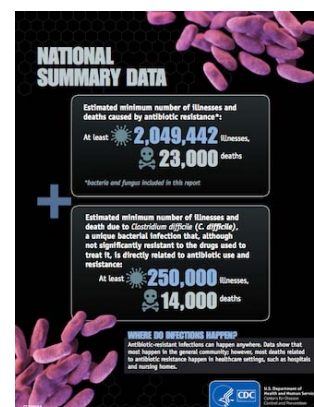
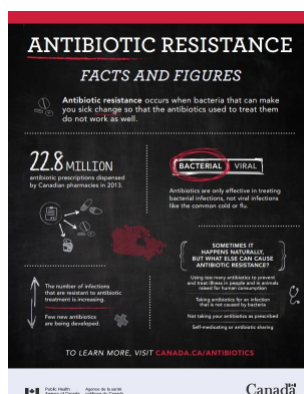
# Antibiotic resistance: a very serious problem

**Tens of thousands of deaths per year!**



More and more bacteria are resistant:  
the tuberculosis bacillus, staphylococcus...

Soon there may be no treatment against gonorrhea



## What can I do?

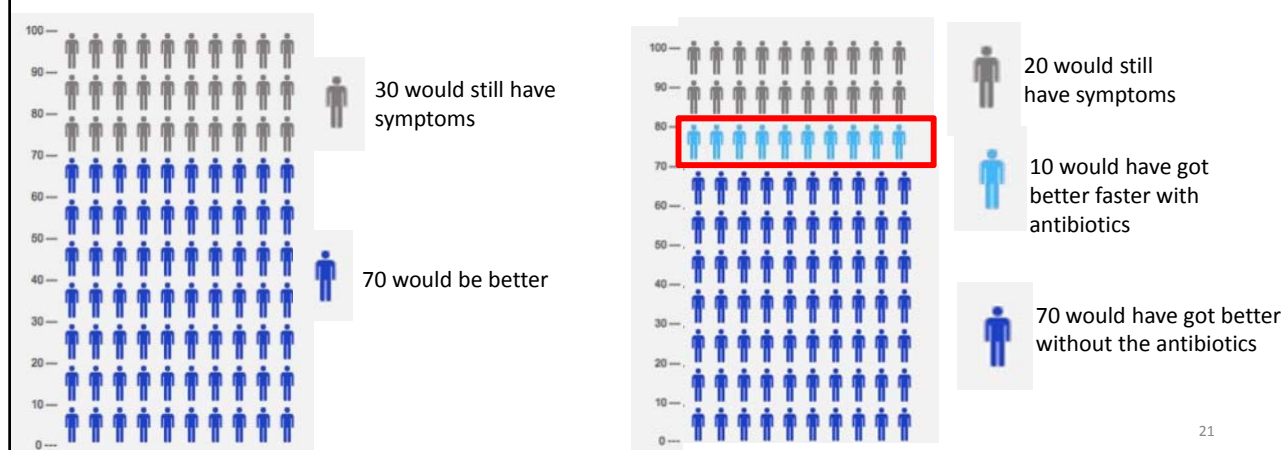
I can be responsible about taking antibiotics  
by only using them when needed and as prescribed

**We're all part of this!**

## If 100 people with an acute respiratory infection

... didn't take antibiotics

... did take antibiotics



## If 100 people with an acute respiratory infection take antibiotics

**90 are taking it for nothing!**

20 are still sick after the average recovery time

+

70 would have recovered without antibiotics

**The other 10 people get better a little faster (a few hours or days)  
than if they hadn't taken antibiotics**

22

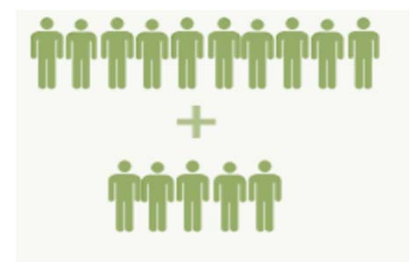
## Out of 100 people with an acute respiratory infection

...and who don't take antibiotics



10 would have additional symptoms because of their illness (diarrhoea, stomach ache, vomiting...)

... and who do take antibiotics



10 would have additional symptoms because of their illness (diarrhoea, stomach ache, vomiting...)



5 would have had side effects from the antibiotics

23

## Shared decisions

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24

## Five questions to ask

- 1) What is my problem?
- 2) What are my options?
- 3) What are the risks?
- 4) What will happen if I do nothing?
- 5) Am I clear about what's important to me?



25

## Which do you prefer?

| Options                         | Benefits<br>(why to choose this)  | Risks<br>(why not to choose this)  |
|---------------------------------|---|--|
| #1<br><i>Take an antibiotic</i> | <ul style="list-style-type: none"> <li>• Slightly increases chances of relieving symptoms faster. +++++</li> <li>• ..... +++++</li> </ul>                 | <ul style="list-style-type: none"> <li>• Taking antibiotics for several days. +++++</li> <li>• Side effects (diarrhea, stomach ache, allergic skin reactions). +++++</li> <li>• ..... +++++</li> </ul> |
|                                 | <ul style="list-style-type: none"> <li>• Heal naturally +++++</li> <li>• Not exposed unnecessarily to antibiotics +++++</li> <li>• ..... +++++</li> </ul> | <ul style="list-style-type: none"> <li>• Slightly reduces chances of relieving symptoms faster. +++++</li> <li>• ..... +++++</li> </ul>  |

26

# Thanks for coming!

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