

## ANTIBIOTICS – WHAT IS RESISTANCE?



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### DEAR READER,

You or your child are bound to have taken an antibiotic at some time or another. Antibiotics are effective medicines for the treatment of infections caused by bacteria. They rank amongst the most frequently prescribed medications.

The use of antibiotics may lead to the occurrence of what is called antibiotic resistance. This means that these medications no longer have an effect on bacteria.

This Patient Information explains how resistance occurs, why they are dangerous and what you, yourself, can do to counteract them.

### ► WHAT IS ANTIBIOTIC RESISTANCE?

Antibiotics combat bacteria by killing them, preventing them from multiplying or inhibiting their growth. (General information on the topic of antibiotics is provided in the Patient Information "Treatment with Antibiotics", see box overleaf.)

Bacteria are highly adaptable and real survivors. They multiply very rapidly in large numbers. This can lead to spontaneous changes in the bacterial genotype. Some of these changes result in pathogens becoming insensitive to certain antibiotics.

Furthermore, bacteria sometimes exchange small parts of their genotype with each other. These genotype parts may also render pathogens resistant, i.e. resistant to antibiotics.

For instance, these changes may result in a bacterium pumping out the medication before it can cause any harm. Or bacteria withstand the effects of an antibiotic by means of specific defence mechanisms.

Sometimes, the bacteria simply modify the site where the antibiotic normally acts.

### ► WHY DOES RESISTANCE OCCUR?

Antibiotic resistance mainly occurs as a consequence of antibiotic misuse. This is the case for instance because:

- antibiotics are taken too frequently.
- antibiotics are frequently taken incorrectly, for example at too low a dose.
- the use of antibiotics in livestock breeding is widespread and they reach humans via the consumption of meat.

### ► WHAT ARE THE CONSEQUENCES?

The more frequently antibiotics are prescribed and taken, the higher the risk of resistant bacteria developing and spreading. This can have serious consequences particularly for small children, the elderly and/or people with chronic disorders:

- Infections last longer.
- Infections are more difficult to treat. Infections that could be effectively treated in the past may become life-threatening.
- For some infections there are hardly any effective antibiotics available any more.
- Infected people need special antibiotics that frequently have more side-effects.
- Hospital stays become longer and more frequent.
- Patients have to be isolated more frequently from other people.

### ▶ WHAT YOU CAN DO

It is important to avoid infections. After all, the fewer the infections, the fewer the antibiotics that are needed and resistance development can be slowed down. Experts estimate that up to 30 out of 100 infections could be avoided by hygiene measures.

You, for instance, can help by doing the following:

- Thoroughly wash your hands several times a day with water and soap for about 30 seconds.
- Make sure your hands are clean after going to the toilet, changing nappies, contact with animals and handling raw meat.
- Always use disposable tissues when blowing your nose and throw them away immediately. If possible, wash your hands right away to avoid transferring the pathogen to other people.
- Don't cough into your hand but into your sleeve. This keeps your hands clean. Keep your distance from other people when you cough.
- Try if at all possible to keep your hands away from your face.
- Thoroughly wash fruit and vegetables that are going to be eaten raw. When preparing food, be sure to clean chopping boards and knives with washing-up liquid and water particularly when you are working with raw meat.
- In enclosed spaces the number of pathogens in the air may increase. Air rooms several times a day for a few minutes.
- Make sure that you and your family have the recommended vaccinations and remember to get the necessary booster inoculations.
- Take the antibiotics as prescribed by your doctor. It is important to take a sufficient dose at regular intervals for a sufficiently long time.
- Do not dispose of any old or left-over medicines in the toilet. This places a burden on the environment and could contribute to the development of resistance. Normally, you can discard medicines in household waste. It is best to wrap them in paper to ensure that no-one can see them and remove them from your rubbish bin. It is preferable to place them in the rubbish bin just before the rubbish is collected.

### ▶ MORE INFORMATION

#### Other useful links

A selection of vetted information on this subject can be accessed by entering the search term "Antibiotic treatment" on:

[www.patienten-information.de](http://www.patienten-information.de)

The information leaflet "Treatment with Antibiotics" is available on:

[www.patienten-information.de/kurzinformation-fuer-patienten](http://www.patienten-information.de/kurzinformation-fuer-patienten)

#### Sources

This information is based on the latest scientific research findings and recommendations for patients by patients. You can access all the sources used here:

[www.patienten-information.de/kurzinformation-fuer-patienten/antibiotika/quellen](http://www.patienten-information.de/kurzinformation-fuer-patienten/antibiotika/quellen)

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