

# 6 things you should know about antibiotics

- **Antibiotic-associated diarrhea** may affect up to **35%**<sup>9-11</sup> of patients
- **Antibiotic-associated diarrhea** may affect **80%** of children<sup>9</sup>
- In **10%-20%** of cases, the diarrhea results from an infection by *Clostridioides difficile*<sup>1</sup>

the ENT microbiota

the pulmonary microbiota

## 1 World Antimicrobial Awareness Week

Each year, from November 18 to 24, the WHO organizes **World Antimicrobial Awareness Week**<sup>15</sup>, which aims to increase awareness of global antimicrobial resistance and to encourage best practices among the general public, health workers and policymakers to avoid the further emergence and spread of drug-resistant infections. As an expert on microbiota, the Biocodex Microbiota Institute takes part in this initiative.

## 2 Antibiotics save lives

Since the discovery of penicillin in 1928, the widespread use of antibiotics has saved millions of lives. The main weapon in the fight against bacterial infections, antibiotics, alongside vaccinations, have added nearly **twenty years to life expectancy**.<sup>1</sup>

## 3 Antibiotics destroy species responsible for infections, but also eliminate good bacteria

Gut, vagina, lungs, skin... many parts of the body play host to microorganisms (bacteria, fungi, viruses). Such microbial communities are known as microbiota.<sup>2</sup> Antibiotics eradicate pathogenic germs responsible for infection but can also **destroy certain beneficial bacteria** in our microbiota, leading to imbalances (**dysbiosis**)<sup>3</sup> of varying degrees within these ecosystems. This concerns all of the body's microbiota, including: the gut,<sup>4</sup> skin,<sup>4</sup> lung,<sup>5</sup> ENT,<sup>6</sup> urinary,<sup>7</sup> and vaginal microbiota.<sup>8</sup>

the vaginal microbiota

## 4 Antibiotics can have side effects

By inducing a dysbiosis, antibiotics can have harmful effects on health. The main short-term complication is the alteration of bowel movements experienced by some patients. This most often results in **diarrhea**, with the gut microbiota less able to perform its protective functions. **Antibiotic-associated diarrhea** is usually mild to moderate<sup>9</sup> in intensity, but its incidence varies according to age, type of antibiotic, context, etc. It may affect up to 35%<sup>9-11</sup> of patients and 80% of children.<sup>9</sup> In 10%-20% of cases, the diarrhea results from **an infection by *Clostridioides difficile* (*C. difficile*)**,<sup>11</sup> a bacterium that colonizes the gut microbiota and becomes pathogenic due to certain factors (e.g. antibiotic use). The clinical consequences vary, ranging from moderate diarrhea to much more serious symptoms, or even death.<sup>11</sup>

the gut microbiota

the skin microbiota

## 5 Antibiotics are thought to be responsible for longer-term effects

Diarrhea is not the only symptom of antibiotic-associated dysbiosis. When it occurs early in life, the condition is thought to be responsible for longer-term effects. The perinatal period, characterized by the development of the gut microbiota and the maturation of the immune system, is a particularly sensitive period.<sup>12</sup> **Antibiotic-associated dysbiosis** during this phase seems to be a **risk factor in the development of certain chronic diseases** (obesity, diabetes mellitus, asthma, inflammatory bowel disease).<sup>13</sup>

the urinary microbiota

## 6 Inappropriate use of antibiotics is responsible for antibiotic resistance

**Antibiotic resistance** happens when an antibiotic treatment is no longer effective against a bacterial infection.<sup>1</sup> The cause? Antibiotics are only effective against bacteria and have no effect on viruses (e.g. the flu).<sup>14</sup> The inappropriate (e.g. with viral infections) or excessive use of antibiotics – in humans or animals – accelerates antibiotic resistance. Antibiotic resistance leads to longer hospitalizations, higher health care costs and more deaths. For this reason, the issue has become a **major public health concern worldwide**.<sup>1</sup>