

# Sulfonamides

Sulfonamides are substances used mainly to treat urinary tract infections. Today, **co-trimoxazole** is the most widely used mixture.

Sulfonamides are administered orally and are well absorbed in the GIT. They are metabolised in the liver and excreted by the kidneys. We must check the patient's pharmacological history before the administration, sulfonamides have numerous drug interactions and must not be administered to pregnant women and children under 2 months of age.

## Mechanism of action

Sulfonamides competitively inhibit the synthesis of folic acid, which is a bacterial growth factor. Thus, antibiotics only act on microorganisms that synthesize their own folic acid. Their effect is **bacteriostatic** to **bactericidal**.<sup>[1]</sup>

## Spectrum of effect and indications

Sulfonamides have an antibacterial effect on both Gram-positive and Gram-negative bacteria. They are effective against *streptococci*, *hemophila*, *actinomyces*, *neisseria*, *chlamydia*.

We use sulfonamides in these diseases

- severe diarrheal infections: typhus, paratyphoid A and B, shigellosis, traveler's diarrhea (Summary of product characteristics)
- kidney and urinary tract infections, (SPC of the product)
- respiratory infections – pneumonia and sinusitis, as a **second-line drug** <sup>[1]</sup>
- brucellosis, (SPC of the product)
- nocardiosis, ulcus molle and granuloma inguinale, which have special dosages. (SPC of the product)

They can be used for prophylaxis and for treatment in pneumocystis pneumonia. <sup>[1]</sup>

## Contraindications and side effects

Side effects include **gastrointestinal upset, photosensitization and skin allergies** (up to Stevens-Johnson and Lyell's syndrome). <sup>[1]</sup>

- bone marrow depression (anemia, leukopenia, thrombocytopenia)

Sulfonamides should not be used by pregnant, lactating women or newborns. Acid urine increases the risk of crystallization in the urinary tract.

## Drug interactions

Sulfonamides have numerous drug interactions - especially with warfarin, methotrexate, sulfonylureas (oral antidiabetics).

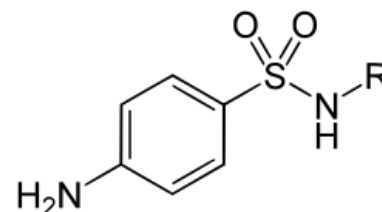
## Individual Antibiotics

This group includes:

- **Sulfisoxazole** is used to treat urinary tract infections.
- **Sulfathiazole** is indicated for topical therapy.
- **Sulfasalazine** is used to treat **ulcerative colitis** because it is poorly absorbed from the GI tract.
- **Sulfamethoxazole** is typically in combination with **trimethoprim**, specifically in a **5:1 ratio** (sulfamethoxazole:trimethoprim, 5:1). Such a mixture is called **cotrimoxazole** (also co-trimoxazole), has a bactericidal effect, and is used to treat urinary tract infections.

**Mechanism of action:** synergistic action of both substances against a number of G + and G– bacteria

**Pharmacokinetics:** Trimethoprim is well absorbed after p.o. administration, penetrates well into body fluids and tissues, is excreted by the kidneys. Sulfamethoxazole is also well absorbed after p.o. administration, penetrates well into tissues, is excreted by the kidneys, where significant tubular reabsorption occurs. It penetrates the placenta and into the milk.



The basic chemical structure of sulfonamides

**Side effects:** nausea, vomiting, dizziness, headache, skin allergies, changes in blood counts.

**Indications:** upper and lower respiratory tract infections, ENT infections, urinary tract infections, gonorrhea and typhoid treatment. Therapy and prophylaxis of *Pneumocystis carini*

**Contraindications:** disorders of hematopoiesis and renal function

## Links

### Related Articles

- Antibiotics
- Quinolones

### External Links

- Sulfonamidy (czech wikipedia)
- Sulfonamide (medicine) (english wikipedia)

### References

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- ROZSYPAL, Hanuš. *Antibiotické minimum VI* [online]. ©2011. [cit. 2019-07-10]. <<https://www1.lf1.cuni.cz/~hrozs/Atb2011/antibio08.htm>>.

### Bibliography

- LINCOVÁ, Dagmar – FARGHALI, Hassan. *Základní a aplikovaná farmakologie*. 2. edition. 2007. ISBN 978-80-7262-373-0.
- MARTÍNKOVÁ, Jiřina – MIČUDA, Stanislav – CERMANOVÁ, Jolana. *Vybrane kapitoly z klinické farmakologie pro bakalářské studium* [online]. ©2005. [cit. 2010-08-14]. <<https://www.lfhk.cuni.cz/farmakol/predn/prednbak.htm/>>.

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