Antibiotice în pediatrie...
de la scenariu la ... scenarită!!

Radu Diaconu
UMF Craiova

Antibioticoterapia și copiii

- Rezistența la antibiotice afectează mai ales grupele cu risc
- 1 din 5 decese din cauza antibioticorezistenței sunt la copii sub 5 ani
- 3 milioane de nou-născuți au anual diagnostic de sepsis

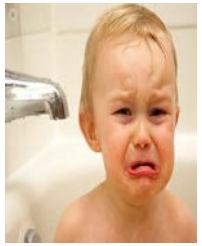
GARDP
Global Antibiotic Research & Development Partnership

https://gardp.org/childrens-antibiotics/

Scenariul 1 – ITU: copil sub 2 ani

Particularități pediatrice:

- Principala cauză de febră fără semne clinice evidente la sugar este ITU
- Cu cât vârsta e mai mică cu atât clinica este mai nespecifică (... Și ...)



- Băieții sunt mai frecvent afectați în primul an de viață
- În primii ani de viață orice ITU trebuie considerată înaltă (pielonefrită)

't Hoen LAA, Bogaert G, Radmayr C, Dogan HS, Nijman RJM, Quaedackers J, Rawashdeh YF, Silay MS, Tekgul S, Bhatt NR, Stein R. Update of the EAU/ESPU guidelines on urinary tract infections in children. J Pediatr Urol. 2021 Apr;17(2):200-207. doi: 10.1016/j.jpurol.2021.01.037. Epub 2021 Feb 2. Erratum in: J Pediatr Urol. 2021 Aug;17(4):598.
Platt C, Larcombe J, Dudley J, McNulty C, Banerjee J, Gyoffry G, Pike K, Jadresic L. Implementation of NICE guidance on urinary tract infections in children in primary and secondary care. Acta Paediatr. 2015 Jun;104(6):630-7. doi: 10.1111/apa.12979. Epub 2015 Apr 2. PMID: 25690406.

Scenariul 1 – ITU: copil sub 2 ani

UTICalc Version 3.0

For children 2 to 23 months of age.

Probability of UTI based on clinical characteristics

Enter child's clinical characteristics below (all fields are required)

Age < 12 months	Yes	No
Maximum temperature ≥ 39 °C (i.e., 102.2°F)	Yes	No
History of UTI*	Yes	No
Female or uncircumcised male	Yes	No
Other fever source**	Yes	No
Duration of fever ≥ 48 hrs	Yes	No
Probability of UTI		

Calculate Clear

*Parent reported or documented history of UTI

https://uticalc.pitt.edu

Scenariul 1 – ITU: copil sub 2 ani

UTICalc Version 3.0

For children 2 to 23 months of age.

Probability of UTI 28.65%

Probability of UTI based on clinical characteristics

Enter child's clinical characteristics below (all fields are required)

RECOMANDARE PUTERNICĂ – obținerea unui eșantion de urină pt cultură!!!

Other fever source** Yes No

Duration of fever ≥ 48 hrs Yes No

Probability of UTI

Calculate Clear

*Parent reported or documented history of UTI

https://uticalc.pitt.edu

Scenariul 1 – ITU: copil sub 2 ani

UTICalc Version 3.0

For children 2 to 23 months of age.

Probability of UTI based on clinical characteristics

Enter child's clinical characteristics below (all fields are required)

Age < 12 months	(•) Yes	( ) No
Maximum temperature ≥ 39 °C (i.e., 102.2°F)	(•) Yes	( ) No
History of UTI*	( ) Yes	(•) No
Female or uncircumcised male	( ) Yes	(•) No
Other fever source**	( ) Yes	(•) No
Duration of fever ≥ 48 hrs	(•) Yes	( ) No

Probability of UTI

Calculate Clear

*Parent reported or documented history of UTI

https://uticalc.pitt.edu

Scenariul 1 – ITU: copil sub 2 ani

UTICalc Version 3.0

For children 2 to 23 months of age.

Probability of UTI **3.74%**

Probability of UTI based on clinical characteristics

Enter child's clinical characteristics below (all fields are required)

Age < 12 months	(•) Yes	( ) No
Maximum temperature ≥ 39 °C (i.e., 102.2°F)	(•) Yes	( ) No
History of UTI*	( ) Yes	(•) No
Female or uncircumcised male	( ) Yes	(•) No
Other fever source**	( ) Yes	(•) No
Duration of fever ≥ 48 hrs	(•) Yes	( ) No

Probability of UTI

Calculate Clear

*Parent reported or documented history of UTI

https://uticalc.pitt.edu

Scenariul 1 – ITU: copil sub 2 ani

Probability of UTI based on clinical & laboratory characteristics

Only enter available test results; leave fields blank for test results that are not available.

Nitrite ○ Yes ○ No

Leukocyte esterase --

WBC/mm^3
(If not available, leave blank. Do not substitute WBC/hpf)

Bacteria on Gram stain ○ Yes ○ No
(If not done leave blank; do not substitute bacteria on urinalysis)
Clear stain selection

Probability of UTI

Calculate Clear

https://uticalc.pitt.edu

Scenariul 1 – ITU: copil sub 2 ani

Probability of UTI based on clinical & laboratory characteristics

Only enter available test results; leave fields blank for test results that are not available.

substitute WBC/hpf)

Bacteria on Gram stain (If not done leave blank; do not substitute bacteria on urinalysis) — Yes / No

Clear stain selection

Probability of UTI 55.44%

Calculate | Clear

RECOMANDARE PUTERNICĂ – obținerea unui eșantion de urină pt cultură!!!

https://uticalc.pitt.edu

Scenariul 1 – ITU: copil sub 2 ani

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN®

Diagnostic – criterii AAP :

- Prezența piuriei/bacteriuriei în sumarul de urină
- Minim 50.000 UFC/ml de urină recoltat CORECT

Romanian Society of Pediatrics

Societatea Română de Pediatrie

Diagnostic – criterii SRP :

- Minim 100.000 UFC/ml de urină
- Intre 10000 și 10000 – repetă
- Sub 1000 - negativă

Scenariul 1 – ITU: copil sub 2 ani

Tehnici de obținere a eșantionului micțional:

- Mijlocul jetului
- Cu pungă (colector) steril
- Tampoane de colectare
- Cateterism vezical
- Puncție suprapubiană

Scenariul 1 – ITU: copil sub 2 ani

Tehnici de obținere a eșantionului micțional:

- Mijlocul jetului – pentru cei cu control sfincterian
- Cu pungă (colector) steril
- Tampoane de colectare
- Cateterism vezical
- Puncție suprapubiană

Scenariul 1 – ITU: copil sub 2 ani

Tehnici de obținere a eșantionului micțional:

- Mijlocul jetului – pentru cei cu control sfincterian
- Cu pungă (colector) steril
- Tampoane de colectare
- Cateterism vezical - SPITAL
- Puncție suprapubiană - SPITAL

Scenariul 1 – ITU: copil sub 2 ani

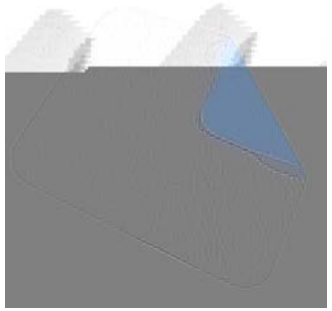
Diagnostic – folosirea colectorului de tip pungă :

- Greu de instalat
- Necesită curățarea tegumentului local
- Rezultate FALS POZITIVE
- Are cu adevărat valoare în caz de rezultat negativ

Scenariul 1 – ITU: copil sub 2 ani

Soluție practică:

- Folosirea unei aleze



- Recoltor de urină steril

Scenariul 1 – ITU: copil sub 2 ani

Soluție practică:

- Pregătim recipientul și asigurăm igiena locală
- Se poate masa hipogastrul pentru a stimula copilul
- Se așteaptă jetul mictional – recipientul NU vine în contact cu tegumentul!

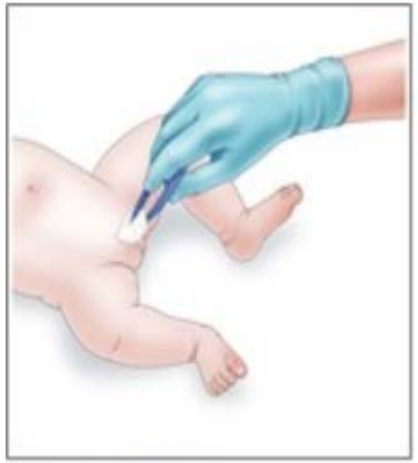


Figure 1: clean

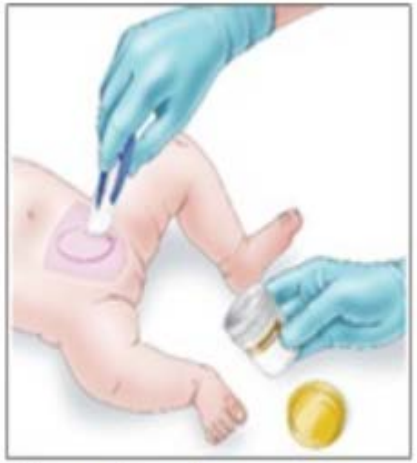


Figure 2: rub

Figure 3: catch

https://www.rch.org.au/kidsinfo/fact_sheets/Urine_samples/

The Royal Children's Hospital Melbourne

Scenariul 1 – ITU: copil sub 2 ani

Terapie empirică per os până la rezultatul uroculturii:

- Cefalosporină de generația II sau III

- Amoxicilină/clavulanat sau sulfametoxazol/trimetoprim

Tratamentul trebuie început DUPĂ recoltarea uroculturii!!

Scenariul 1 – ITU: copil sub 2 ani

Terapie empirică parenterală până la rezultatul uroculturii:

- Ceftriaxonă
- Cefotaxim
- Ampicilină
- Gentamicină

Tratamentul trebuie început DUPĂ recoltarea uroculturii!!

Scenariul 2 – IACRS

SIMPTOME	VIRAL	BACTERIAN	GRIPĂ	ALERGIE
FEBRĂ	Frecvent	Frecvent, ridicată	Ridicată, durată lungă	NU
CEFALEE	Rar, mai des in COVID	Frecvent	Puternică	RAR
MIALGII	Uneori	NU	Frecvent	NU
ASTENIE	Uneori	Uneori	Frecvent	Rareori
INAPETENȚĂ	Uneori	Uneori	Uneori	Rar
ODINOFAGIE	Frecvent	Frecvent, intensă	Frecvent	NU
EXUDAT AMIGDALIAN	Uneori	Frecvent	Uneori	NU
PETEȘII LOCAL	Uneori	Frecvent	Uneori	NU
RINOREE SAU OBSTRUCȚIE NAS	Frecvent	NU	Uneori	Frecvent
STRĂNUT	Frecvent	NU	Uneori	Frecvent
DIAREE, GREȚĂ, VĂRSĂTURI	Frecvent	NU	Rar	NU

Adaptat după: Protocoale de Diagnostic și Tratament in Pediatrie 2023
Ghidul NICE

Scenariul 2 – IACRS

SIMPTOME	VIRAL	BACTERIAN	GRIPĂ	ALERGIE
FEBRĂ	Frecvent	Frecvent, ridicată	**Ridicată, durată lungă**	NU
CEFALEE	Rar, mai des in COVID	Frecvent	**Puternică**	RAR
MIALGII	Uneori	NU	Frecvent	NU
ASTENIE	Uneori	Uneori	Frecvent	Rareori
INAPETENȚĂ	Uneori	Uneori	Uneori	Rar
ODINOFAGIE	Frecvent	**Frecvent, intensă**	Frecvent	NU
EXUDAT AMIGDALIAN	Uneori	**Frecvent**	Uneori	NU
PETEȘII LOCAL	Uneori	**Frecvent**	Uneori	NU
RINOREE SAU OBSTRUCȚIE NAS	**Frecvent**	NU	Uneori	**Frecvent**
STRĂNUT	**Frecvent**	NU	Uneori	**Frecvent**
DIAREE, GREȚĂ, VĂRSĂTURI	**Frecvent**	NU	Rar	NU

Adaptat după: Protocoale de Diagnostic și Tratament in Pediatrie 2023
Ghidul NICE

Scenariul 2 – IACRS

Modified Centor Criteria (McIsaac)	Score
Fever	1
Tonsillar Exudate	1
Absent Cough	1
Anterior Cervical LAD	1
Age 3-14 years	1
Age 15-44 years	0
Age >44 years	-1

Modified Centor Criteria Score	GAS Infection Risk (%)	AAP/IDSA	CDC/ACP/AAFP
0	1-2.5	No test/treatment	No test/treatment
1	5-10	No test/treatment	No test/treatment
2	11-17	Rapid antigen test	Rapid antigen test
3	28-35	Rapid antigen test	Test or treat empirically
≥4	51-53	Rapid antigen test	Test or treat empirically

Protocoale de Diagnostic și Tratament in Pediatrie 2023
https://www.tamingthesru.com/blog/intern-diagnostics/enter-the-centor

Scenariul 2 – IACRS

Sore throat (acute): antimicrobial prescribing

Acute sore throat

Use FeverPAIN or Centor score for assessing symptoms

Advise:

- sore throat can last around 1 week
- manage symptoms with self-care

FeverPAIN score 0 or 1 or Centor score 0, 1 or 2 → Do not offer an antibiotic

FeverPAIN score 2 or 3 → Consider no antibiotic or a back-up antibiotic prescription

FeverPAIN score 4 or 5 or Centor score 3 or 4 → Consider an immediate antibiotic or a back-up antibiotic prescription

When no antibiotic given, advise:

- antibiotic is not needed
- seeking medical help if symptoms worsen rapidly or significantly, do not start to improve after 1 week or the person becomes very unwell

With a back-up antibiotic prescription, advise:

- antibiotic is not needed immediately
- use prescription if no improvement in 3 to 5 days, or symptoms worsen
- seeking medical help if symptoms worsen rapidly or significantly or the person becomes very unwell

With an immediate antibiotic prescription, advise:

- seeking medical help if symptoms worsen rapidly or significantly or the person becomes very unwell

Reassess at any time if symptoms worsen rapidly or significantly, taking account of:

- other possible diagnoses
- any symptoms or signs suggesting a more serious illness or condition
- previous antibiotic use, which may lead to resistant organisms

If the person:

is systemically very unwell, or

has symptoms and signs of a more serious illness or condition, or

has high risk of complications

→ Offer an immediate antibiotic prescription → Refer to hospital if:

- severe systemic infection, or
- severe complications

Self-care

- Consider paracetamol for pain or fever, or if preferred and suitable, ibuprofen
- Drink adequate fluids
- Some evidence that medicated lozenges can help reduce pain in adults
- No evidence was found for non-medicated lozenges, mouthwashes, or local anaesthetic mouth spray on its own

Evidence on antibiotics

- Antibiotics make little difference to how long symptoms last or the number of people whose symptoms improve
- Withholding antibiotics is unlikely to lead to complications
- Possible adverse effects include diarrhoea and nausea

FeverPAIN score

- Fever; purulence; attend within 3 days or less; severely inflamed tonsils; no cough or coryza

1 point for each

Centor score

- Tonsillar exudate; tender anterior cervical lymphadenopathy or lymphadenitis; history of fever (>38°C); no cough

1 point for each

Updated February 2023

NICE National Institute for Health and Care Excellence

Scenariul 2 – IACRS

Sore throat (acute): antimicrobial prescribing

Antibiotic (1)	Dosage and course length for children and young people under 18 (2)
First choice	
Phenoxymethylpenicillin	1 to 11 months: 62.5 mg four times a day, or 125 mg twice a day for 5 to 10 days 1 to 5 years: 125 mg four times a day, or 250 mg twice a day for 5 to 10 days 6 to 11 years: 250 mg four times a day, or 500 mg twice a day for 5 to 10 days 12 to 17 years: 500 mg four times a day, or 1000 mg twice a day for 5 to 10 days Five days of phenoxymethylpenicillin may be enough for symptomatic cure, but a 10-day course may increase the chance of microbiological cure
Alternative first choice for penicillin allergy or intolerance (for people who are not pregnant)	
Clarithromycin	1 month to 11 years: Under 8 kg: 7.5 mg/kg twice a day for 5 days 8 to 11 kg: 62.5 mg twice a day for 5 days 12 to 19 kg: 125 mg twice a day for 5 days 20 to 29 kg: 187.5 mg twice a day for 5 days 30 to 40 kg: 250 mg twice a day for 5 days 12 to 17 years: 250 mg to 500 mg twice a day for 5 days
Alternative first choice for penicillin allergy in pregnancy	
Erythromycin	8 to 17 years: 250 mg to 500 mg four times a day, or 500 mg to 1000 mg twice a day for 5 days Erythromycin is preferred if a macrolide is needed in pregnancy, for example, if there is true penicillin allergy and the benefits of antibiotic treatment outweigh the harms. See the Medicines and Healthcare products Regulatory Agency (MHRA) Public Assessment Report on the safety of macrolide antibiotics in pregnancy

1 Note: see the BNF for children for appropriate use and dosing in specific populations, for example, hepatic impairment or renal impairment.

2 Note: the age bands given in the table apply to children of average size and, in practice, the prescriber will use the age bands in conjunction with other factors such as the severity of the condition and the child's size in relation to the average size of children of the same age.

NICE National Institute for Health and Care Excellence

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Scenariul 2 – IACRS

Romanian Society of Pediatrics
Societatea Română de Pediatrie

Terapie antistreptococică - CÂND:

- Simptomatici cu test rapid pozitiv
- Scarlatină
- Faringită – dacă un membru al familiei este diagnosticat cu infecție steptococică
- APP sau AHC recente de RAA
- Faringită la un copil ce locuiește într-o zonă endemică pt RAA sau GNAPS

Scenariul 2 – IACRS

Romanian Society of Pediatrics
Societatea Română de Pediatrie

Terapie antistreptococică - CU CE:

- **DE ELECȚIE:** penicilină V sau amoxicilină
- Alergici la penicilină de tip non-imediat: cefalosporine gen I (Cefadroxil)
- Alergici la penicilină de tip imediat: Azitromicină, Claritromicină
- Alergici la peniclină și rezistenți la macrolide: Clindamicină
- Recurențe – Clindamicină, Cefuroxim
- Non-complianți SI fara alergie la peniciline: Benzatinpenicilină (o doză)
- ***NU SULFAMIDE și TETRACICLINE!***

Scenariul 2 bis – scarlatină

Institutul National de Sănătate Publică Romania

Metodologie de supraveghere a scarlatinei in Romania

Terapie antistreptococică - CU CE:

Tratamentul cu antibiotic, de electie in cazurile de angina streptococica/scarlatina:

- pentru persoane care nu sunt alergice la penicilina - penicilina sau amoxicilina pentru o perioada de 10 zile;
- pentru persoane care sunt alergice la penicilina - cefalosporina de generatia I, clindamicina sau claritromicina pentru o perioada de 10 zile.
- daca nici unul din aceste antibiotice nu este disponibil, poate fi administrata azitromicina pentru o perioada de 5 zile.

Recomandări pentru ambulator

Pharyngitis[4, 6]	• Recent guidelines aim to minimize unnecessary antibiotic exposure by emphasizing appropriate use of rapid antigen detection test (RADT) testing and subsequent treatment . • During the winter and spring, up to 20% of asymptomatic children can be colonized with group A beta-	• Clinical features alone do not distinguish between GAS and viral pharyngitis. • Children with sore throat plus 2 or more of the following features should undergo a RADT test: • absence of cough • presence of tonsillar exudates or swelling • history of fever	• Amoxicillin and penicillin V remain first-line therapy. • For children with a non-type I hypersensitivity to penicillin: cephalexin, cefadroxil, clindamycin, clarithromycin, or azithromycin are recommended. • For children with an immediate type I hypersensitivity to penicillin: clindamycin, clarithyomycin, or azithroymycin are recommended. • Recommended treatment course for all oral beta lactams is 10 days.

Sfaturi practice pentru părinți

Medicines for Children

Medicines for Children information for parents and carers

General advice about antibiotics

This leaflet gives general information about giving antibiotics to children. Leaflets on individual antibiotics are available on www.medicinesforchildren.

This leaflet is for parents and carers about how to use these medicines in children. Our information sometimes differs from that provided by the manufacturers, because their information is usually aimed at adults. Please read this leaflet carefully. Keep it somewhere safe so that you can read it again.

If your child has ever had a reaction to any medicine, tell your doctor **before** giving the antibiotic.

Why is it important for my child to take an antibiotic?

If your child is prescribed an antibiotic, it is important that they take this medicine so that it kills the harmful bacteria and gets rid of, or prevents, the infection.

How much should I give, and when should I give it?

Your doctor will work out the amount of medicine (the dose) that is right for your child. The dose will be shown on the medicine label.

Your doctor or pharmacist will also tell you how often you need to give the medicine.

⚠ **It is important that you follow your doctor's instructions about how much to give.**

What if I forget to give it or give too much?

Antibiotics work best when given regularly. They are unlikely to cause any problems if you give an extra dose by mistake. Detailed information about what to do if you forget to give an antibiotic or give too much is available on the individual medicines leaflets for each antibiotic on the Medicines for Children website www.medicinesforchildren.org.uk

If you are concerned that you have forgotten to give several doses or have given your child too much, contact your doctor or local NHS services (details at end of leaflet). Have the medicine or packaging with you if you telephone for advice.

Can other medicines be given at the same time?

- You can give your child medicines that contain paracetamol, unless your doctor has told you not to.
- Some antibiotics should not be taken with some other medicines that you get on prescription. Check with your doctor or pharmacist **before** giving any other medicines to your child. This includes herbal and complementary medicines, and some medicines that you can buy over the counter.

General advice about antibiotics

- Children are sometimes sick (vomit) or get diarrhoea when taking antibiotics. Encourage them to drink water to replace the fluid they have lost. If it is severe or your child is drowsy, floppy or does not respond, contact your doctor, local NHS services (details at end of leaflet) or take your child to hospital.
- **Do not** give your child any medicine to stop the diarrhoea unless your doctor has told you to.
- Try to give the medicine at about the same times each day, to help you remember, and to make sure that there is the right amount of medicine in your child's body to kill the bacteria.
- Only give this medicine to your child for their current infection.
- **Never save** medicine for future illnesses. Return any unused medicine to your pharmacist.
- Only give the antibiotic to the child for whom it was prescribed. Never give it to anyone else, even if their condition appears to be the same, as this could do harm.

Preventing antibiotic resistance

- It is important that your child completes the course of antibiotic. This means that they must take the medicine for the number of days that the doctor has told you to, or until all the medicine has been taken. If you stop giving the antibiotic too soon, bacteria that are left may start to multiply again, and may cause another infection.
- In the past, doctors may have prescribed antibiotics for many types of infection. However, this practice is now changing with growing concern about the risk of antibiotic resistance.
- Bacteria that become "resistant" to a common antibiotic are no longer killed by it, and infections may become harder to treat. It is therefore important that antibiotics are used only when needed.
- Many common illnesses, such as sore throats, colds, coughs and flu, are caused by viruses. Antibiotics do not kill viruses, so your doctor will not prescribe antibiotics for these illnesses.
- Antibiotics do not always shorten the duration of an infection. Most children can fight mild infection such as ear infection or tonsillitis. It is now recommended that doctors do not prescribe antibiotics if they think the infection will get better on its own. You can give your child medicines such as paracetamol to help with symptoms while their immune system fights the infection.
- It should be remembered that antibiotics can cause side-effects or allergic reactions. Your doctor will consider the benefits and risks of the illness and its treatment when deciding whether to prescribe an antibiotic.

VĂ MULȚUMESC!!