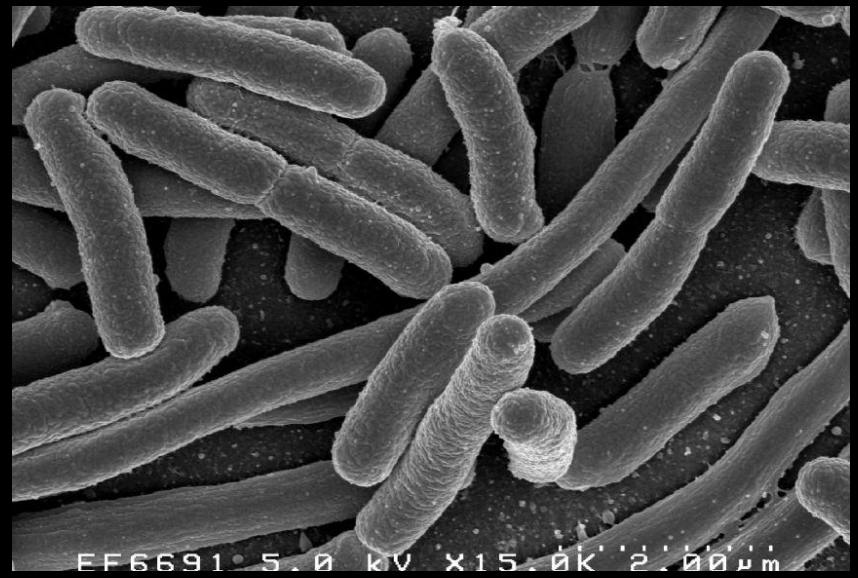
Antibiotics

Basic facts for selecting and using antibiotics

CME 13th of April 2023 in the Kwanza Sub-County Hospital



Dr L Salmi, 2023

How to avoid antibiotic resistance?

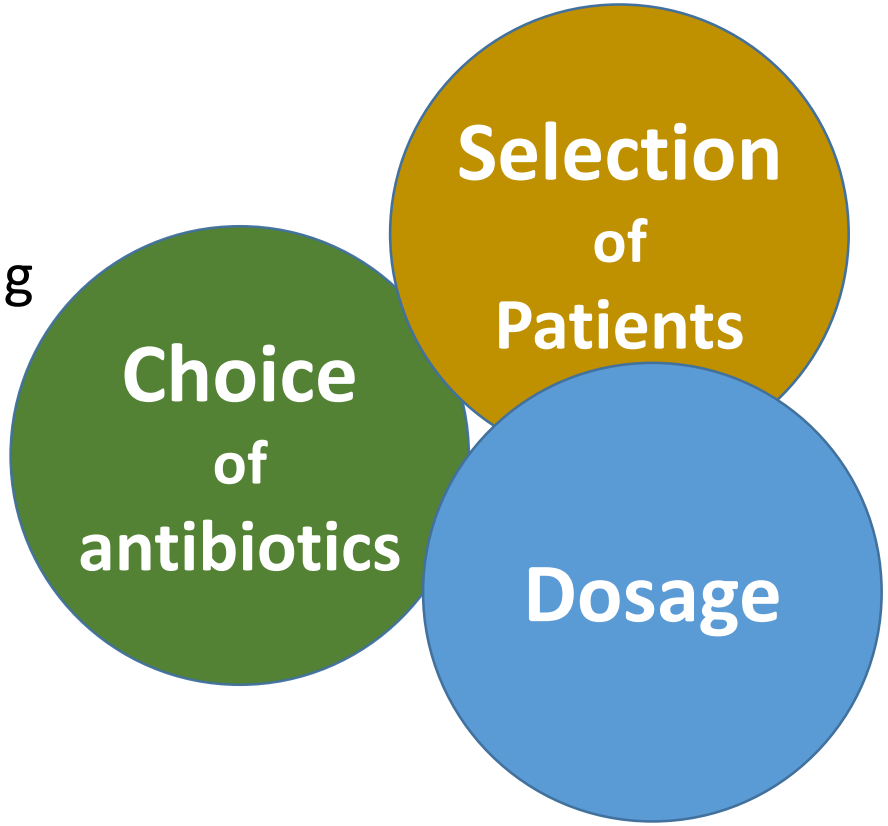
Basic principles:

- Right choice of antibiotics (type of bacteria, illness)
- Only to patients that benefits (potentially sufficiently ill)
- With correct dosage to ensure a concentration above MIC (minimal inhibitory concentration) during whole period of treatment
- Optimal time of treatment

3 main areas

Right choice of antibiotics depending on expected type of bacteria

- Gram +
- Gram –
- Aerobic
- Anaerobic



Only to patients that benefits (potentially sufficiently ill)

- Expected bacterial cause
- Not to virus infections

Optimal dosage regime

- Concentration above MIC
- Optimal time (higher concentration, shorter time of treatment)

Choice of antibiotics

How do antibiotics work?

Inhibiting the bacteria to

- build up its cell wall
- synthesize necessary proteins
- reproduce its genetic content

- Inhibit bacterial reproduction
- Kill bacteria

… but many bacteria rapidly adopt and sustain

Choice of antibiotics

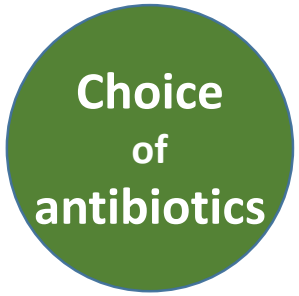
Different types of antibiotics

	cell wall	proteins	genetic content
• Penicillines	X		
• Cephalosporines	X		
• Fluoroqinolones			X
• Macrolides		X	
• Tetracyclines		X	
• Imidazoles			X
• Nitrofurantoin		X	X

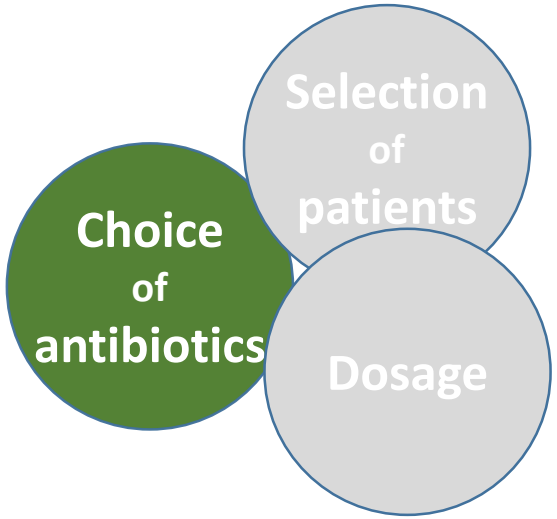
Choice of antibiotics

Different types of antibiotics

	Gram +	Gram -	Aerobic	Anaerobic
• Penicillines	X		X	
• Cephalosporines	X	X	X	
• Fluoroqinolones		X	X	
• Macrolides	X	X	X	X
• Tetracyclines	X	X	X	
• Imidazoles				X
• Nitrofurantoin		X	X	



… and now we are even more confused !



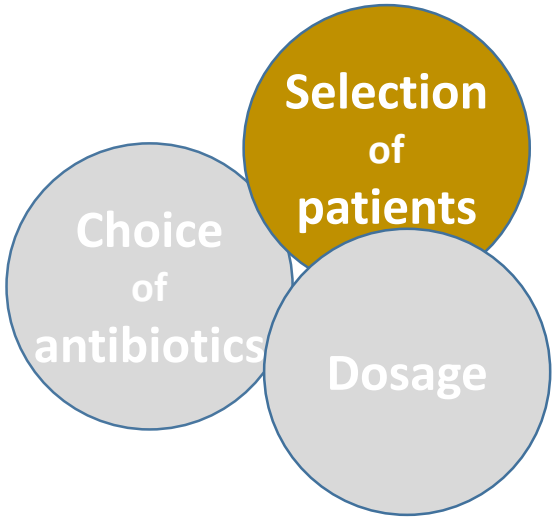
Example: A practical approach

Type of bacteria

- Academically correct, practically difficult
- Lots of exceptions

Use local guidelines with recommendations for a limited number of cases, e.g.

- Airway
- Skin, soft tissue
- Abdominal
- Urinary tract
- …



Selection: About evaluating the patient

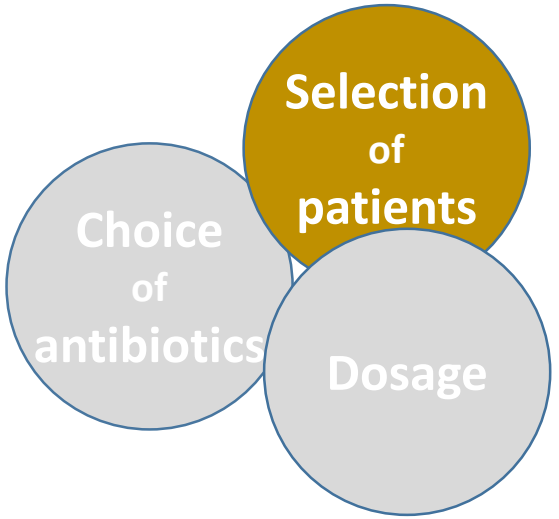
How can we evaluate?

- Triage
- Clinical investigation

- Anamnestic information
- Clinical symptoms

  Cognitive, Resp rate, Pain, Fewer, Urine production, Organ specific observations, etc
- Laboratory tests

  CRP (infection), LPK, Hb, Glu
  Temp, POx, Blood pressure, HR
  Urinary test
  …



Who needs treatment with antibiotics?

WHEN

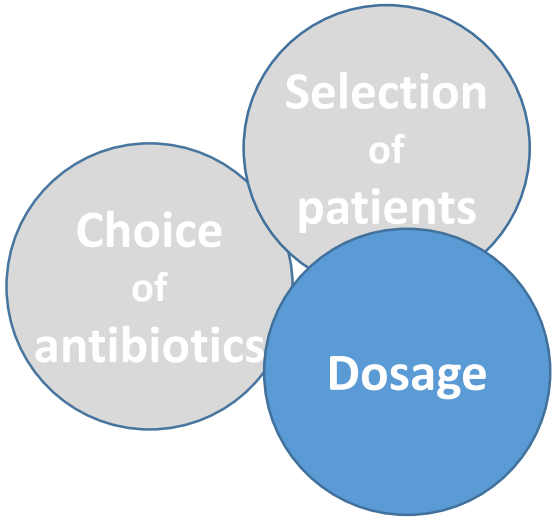
- Evaluation points towards bacterial cause of infection (or evaluation is uncertain)

AND

- Status of the patient is severe and/or with risk for patient to deteriorate without treatment

OR

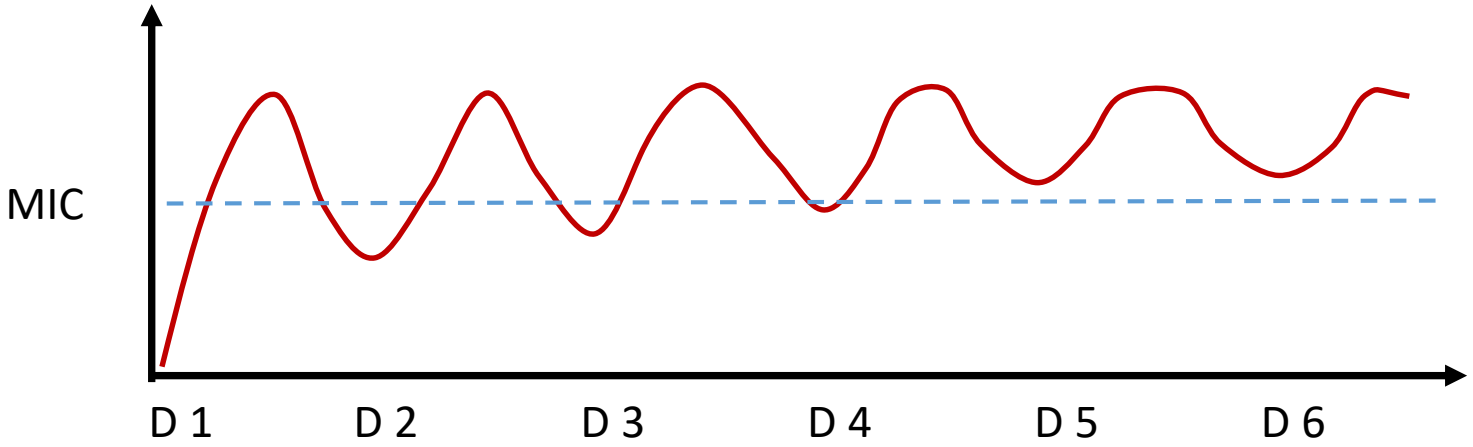
- Social situation makes following-up difficult
- Risk of spreading



Prescribe for optimal effect

Optimal dosage regime

- Depends on choice of antibiotics
- Concentration above MIC (minimal inhibitory concentration) during whole period of treatment
- Optimal time (higher concentration, shorter time of treatment)



Example: What can you prioritize?

Establish local guideline with recommendations for choice and prescribed dosage for a limited number of medical situations, e.g.

- Airway
- Skin, soft tissue
- Abdominal
- Urinary tract
- …

Establish local guidelines for the clinical evaluation of patients and train practically. Inter collegial case discussions.

Follow up upon prescriptions.

Start with what you already have in stock

- Penicillines: Penicillin V/Benzyl PC, Amoxicillin, Amoxiclav Flucloxacillin
- Cephalosporines: Ceftriaxone, Ceftazidime
- Fluoroqinolones: Ciprofloxacin, Levofloxacin
- Macrolides: Claritromycin
- Folate inhibitor/sulfonamide: CoTrimoxazole
- Imidazoles: Metronidazole
- Aminoglycoside: Gentamicin
- Other: Nitrofurantoin
- Anti Fungal: Fluconazole, Nystatin

Example primary health care: To start with…

• Upper airway: none	
• Lower airway: Penicillin V (Amoxicillin*)	1 g x 3 for 7 days
• Otitis: Penicillin V (Amoxicillin*)	1,6-2 g x 3 for 5 days
• Skin, soft tissue: Penicillin V (Amoxicillin*) (Flucloxacillin, Clindamycine)	1 g x 3 for 10 days
• Wounds: Flucloxacillin (Amoxicillin*)	1 g x 3 for 7 days
• GI: Azitromycine, Metronidazole, Ciprofloxacin	Varies depending on AB
• Urinary tract: Nitrofurantoin	50 mg x 3 for 5-7 days

* Amoxicillin 500 mg x 3, duration as PcV

Example local recommendations (Swedish health care)

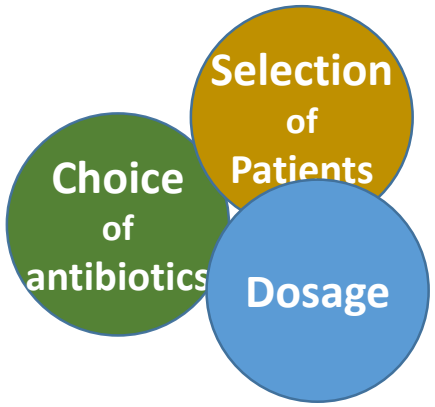

GÄLLER FRÅN **2022-12-29**

Behandlingsrekommendationer
för vanliga infektioner i öppenvård

- Tecken på allvarlig infektion hos vuxna och barn
- Akut mediaotit
- Rinosinuit
- Faryngotonsillit
- Akut bronkit och pneumoni
- Akut exacerbation av KOL
- Urinvägsinfektioner
- Hud- och mjukdelsinfektioner
- Sexuellt överförbara bakteriella infektioner

Detta är en digital version av Behandlingsrekommendationer för vanliga infektioner i öppenvård. Den senaste uppdateringen gjordes 2022-12-20. Om du har en pappersbroschyr kan den skilja sig något från denna digitala version.

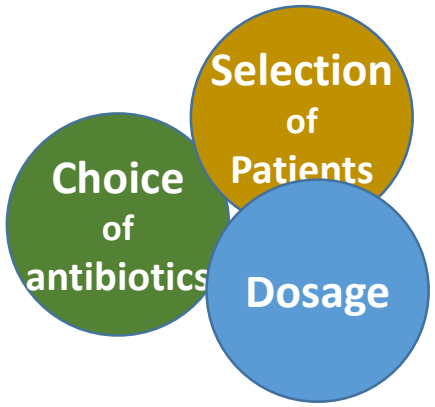
Folkhälsomyndigheten LÄKEMEDELSVERKET MEDICAL PRODUCTS AGENCY Strama



Conclusions

- **Based on your clinical evaluation: Choose the right patient to treat with antibiotics.**
- Use inter collegial discussions as a basis for competence development. Develop local guidelines with recommendations for a limited number of typical cases.
- Use the current set of antibiotics. It will cover most cases. No obvious lack of coverage.

Comment from the audience: But there is still another problem…



Another problem…

It is common amongst people in the community to buy antibiotics without prescription!

Often wrong antibiotics, to short treatment and not correct dosage.

This will have a clear negative effect on the development of antibiotic resistance.

Future challenges:

- Regulation
- Education to the community

Finally: Think about the basics…
…and come up with local solutions