Treatment Guidelines and Antimicrobial Resistance

Jako Burgers, MD, PhD
Dutch College of General Practitioners

Antibiotics and Resistance in Primary Care: the European Experience
Amsterdam, 28 February 2014
My Background

• General Practitioner, Gorinchem (2 days/wk)
• Head Dep. Guideline Development and Research, Dutch College of General Practitioners
• Researcher in clinical practices guidelines and implementation science
• Harkness Fellow 2008/2009, Commonwealth Fund International Program in Health Policy & Practice
Outline presentation

• Introduction of Dutch College of General Practitioners
• Introduction of guideline development
• Recommendations on antibiotic treatment
• Implementation of guidelines
• Key factors for success
General Practice in Netherlands: Basic Characteristics

- 10,000 general practitioners (GPs), 4,000 practices
- All have practice assistance, 80% practical nurse
- All practices have electronic healthcare record system
- All Dutch citizens are registered with one GP
- GP is gatekeeper to hospital and specialist care
- GPs offer out of hours service covering whole country
- No co-payment for GP visits
- 90-95% is member of Dutch Association of GPs and Dutch College of GPs
Dutch College of General Practitioners (NHG)

- **Aims:** knowledge translation, educational and decision support
- **Funding:** member fees, health insurers, projects and products
- **Products:**
  - evidence-based guidelines (n=90)
  - other guidance, incl. computer decision support
  - educational materials, incl. e-learning
  - scientific journal (monthly)
  - patient education, i.e. Thuisarts.nl
NHG Organisation

- Staff: 130 / 65 fte
- Dep. Guideline development & research
- Dep. Implementation
- Dep. Policy, Communication and marketing
- Journal Editorial Office
- Supportive departments:
  - Congress management
  - Human resource management
  - Financial administration
Successful products of NHG
Welkom bij

THUISARTS.NL

Trefwoord Zoeken

Stefan Snieders, huisarts

Thuisarts.nl geeft betrouwbare informatie over gezondheid en ziekte:
- bij vragen en klachten thuis;
- voor, tijdens en na uw bezoek aan de huisarts.

Thuisarts.nl is samengesteld door huisartsen.

Zoeken op lichaamsdeel

Ga direct naar

Huisartsenzorg

Actueel
- Test op longziekte COPD
- Wandelaars leven langer
- Vis en beroerte

Meer nieuws

Updates
- Buikpijndagboek voor kinderen
- Lichen Sclerosus
  Nieuw: 'Liesbreuk' en 'Scheenbeenklachten'
Quality Assurance in General Practice

- Continuing Medical Education using guidelines developed by Dutch College of GPs, is mandatory for re-licence (every 5 years)
- Participation in peer review groups is mandatory
- Computer decision support and electronic prescribing integrated in electronic medical record system
- Practice visitation will be mandatory in 2016, incl.:
  - Practitioners feedback
  - Patient satisfaction
Peer Review: Pharmacotherapy Audit Meetings (PTAMs)

- > 90% GPs and pharmacists participate in PTAMs
- Locally organized, mean of 12 participants per group, 6 to 8 meetings per year
- Aim: improve quality of drug prescribing
- Methods: guidelines, audit and feedback of individual prescription data, local agreements on drug choice
- Higher quality of PTAM correlates to better adherence to recommendations on drug prescribing
Antibiotics Prescriptions with Respiratory Tract Infections in 2009

- Smal spectr. penicil.
- Amoxicilline
- Doxycycline
- Macroliden
- Amox / clav. zuur

<table>
<thead>
<tr>
<th></th>
<th>Dutch GPs</th>
<th>My town GPs</th>
<th>Dutch specialists</th>
<th>My town specialists</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smal spectr. penicil.</td>
<td>503134</td>
<td>736</td>
<td>88291</td>
<td>180</td>
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<td>Amoxicilline</td>
<td>771864</td>
<td>1456</td>
<td>45800</td>
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<tr>
<td>Doxycycline</td>
<td>519581</td>
<td>1334</td>
<td>158062</td>
<td>405</td>
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<tr>
<td>Macroliden</td>
<td>650871</td>
<td>975</td>
<td>55351</td>
<td>57</td>
</tr>
<tr>
<td>Amox / clav. zuur</td>
<td>150134</td>
<td>189</td>
<td>7296</td>
<td>16</td>
</tr>
</tbody>
</table>
Antibiotics with RTI in my town in 2009

- Macroliden
- Doxycycline
- Amox / clav. zuur
- Amoxicilline
- Smal spectr. penicil.
Antibiotics Prescriptions with Urinary Tract Infections in 2009

Graph showing the distribution of antibiotic prescriptions by type and source:
- **Dutch GPs**
  - fosfomycin: 60%
  - chinolones: 20%
  - co-trimoxazole: 5%
  - trimethoprim: 15%
  - nitrofurantoin: 10%
- **My town GPs**
  - fosfomycin: 70%
  - chinolones: 20%
  - co-trimoxazole: 5%
  - trimethoprim: 5%
  - nitrofurantoin: 10%
- **Dutch specialists**
  - fosfomycin: 70%
  - chinolones: 20%
  - co-trimoxazole: 5%
  - trimethoprim: 5%
  - nitrofurantoin: 10%
- **My town specialists**
  - fosfomycin: 60%
  - chinolones: 30%
  - co-trimoxazole: 5%
  - trimethoprim: 5%
  - nitrofurantoin: 10%
Antibiotics with UTI in my town in 2009

- fosfomycin
- chinolone
- co-trimoxazole
- trimethoprim
- nitrofurantoin
Number of antibiotic prescriptions for RTI per GP in 2009 (adjusted to practice size)
Number of antibiotic prescriptions for RTI per GP in 2009 (adjusted to practice size)

Mean = 315
Number of antibiotic prescriptions for UTI per GP in 2009 (adjusted to practice size)
Number of antibiotic prescriptions for UTI per GP in 2009 (adjusted to practice size)

Mean = 166
% prescriptions second line antibiotics per GP in 2009

- Macrolides
- Quinolones
Definition of Guidelines

“Clinical practice guidelines are statements that include recommendations intended to optimize patient care that are informed by a systematic review of evidence and an assessment of the benefits and harms of alternative care options”

Institutes of Medicine, 2011
Guidelines in Dutch general practice

• 1989: first guideline on diabetes mellitus type 2
• 1993: first book including 30 guidelines
• September 2012: guideline no. 100 was released
• 75% of the guidelines has been updated at least once
• 70-75% adherence to guideline recommendations

http://www.nhg.org
NHG Guidelines: principles

- Targeting GPs – developed by GPs
- Focusing on primary care population
- Evidence-based medicine
- Considering effectiveness, safety, and costs
- Do not harm, in dubio abstine
- Critical towards new drugs or interventions
Evidence-based Guideline Development

- Systematic reviews and meta-analyses
- Randomised controlled trials
- Cohort, case control studies
- Uncontrolled studies
- Expert opinion

**Conclusion including Level of evidence**

**Considered judgement**

- Clinical relevance
- Patient safety
- Patient preferences
- Availability of services
- Organisation of care
- Impact on costs
- Legal consequences

**Recommendation**

("evidence plus experience")
The AGREE Instrument (AGREE II)

- 23 items
- 7-point Likert Scale

Overall assessment

User guide

Six domains

1. Scope & purpose (3)
2. Stakeholder involvement (3)
3. Rigour of development (8)
4. Clarity & presentation (4)
5. Applicability (3)
6. Editorial independence (2)

www.agreetrust.org
Acute keelpijn

Samenvattingskaart M11

**Cluster:** R. Luchtwegen  
**Status:** In herziening - 2007

Inhoudsopgave

**Begrippen**

Richtlijnen diagnostiek
- Anamnese (eventueel telefonisch)
- Lichamelijk onderzoek
- Aanvullend onderzoek
- Evaluatie

Richtlijnen beleid
- Voorlichting
- Medicamenteuze behandeling

Controle en verwijzing
- Tonsillectomie

PDF-versie

Download standaard

Overige downloads

Lacunes M11

Scholingsaanbod

Onderwijsmateriaal Acute keelpijn

Producten winkel

Standaard M11 Acute keelpijn  
Samenvattingskaart M11 Acute keelpijn

www.nhg.org.
NHG Guidelines classified to ICPC cluster (n=90)
NHG Guidelines addressing antibiotic treatment classified to ICPC cluster (n=20)
# Recommendations on antibiotic treatment in Dutch GP guidelines

<table>
<thead>
<tr>
<th>Guideline</th>
<th>Indication</th>
<th>First choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Otitis media (OM)</td>
<td>- Severely ill or becoming more ill&lt;br&gt;- Age &lt; 2 years with two sided OM&lt;br&gt;- OM with ear discharge&lt;br&gt;- Risk factors for complications (e.g. age &lt; 6 months, Down syndrome, palatoschisis, immunocompromised)</td>
<td>- Amoxicillin&lt;br&gt;- In case of contra-indications: azithromycin or cotrimoxazol</td>
</tr>
<tr>
<td>Rhinosinusitis</td>
<td>- Severely ill&lt;br&gt;- Persisting symptoms after 2 weeks&lt;br&gt;- Recurrent fever&lt;br&gt;- 4th recurrence within 1 year&lt;br&gt;- Immunocompromised</td>
<td>- Amoxicillin or doxycycline&lt;br&gt;- In case of allergy erythromycin</td>
</tr>
<tr>
<td>Acute sore throat</td>
<td>- Severe inflammation&lt;br&gt;- Peritonsillar infiltrate&lt;br&gt;- Scarlet fever and severe ill&lt;br&gt;- Immunocompromised&lt;br&gt;- Acute rheuma in history&lt;br&gt;- Streptococcus epidemic in closed community</td>
<td>- Feneticillin or fenoxyxymethylpenicillin&lt;br&gt;- In case of allergy: azithromycin</td>
</tr>
<tr>
<td>Acute cough</td>
<td>- Severely ill (tachypnea, tachycardia, hypotension, confusion)&lt;br&gt;- Modest ill and:&lt;br&gt;  - One sided auscultatory abnormalities&lt;br&gt;  - CRP &gt; 100 mg/L&lt;br&gt;  - Age &lt; 3 months or &gt; 75 year&lt;br&gt;  - Infiltrate on X-ray&lt;br&gt;  - Persisting fever and coughing &gt; 7 days</td>
<td>- Amoxicillin or docycyclin&lt;br&gt;- In case of contra-indications: macrolide</td>
</tr>
<tr>
<td>Urinary tract infections (UTI)</td>
<td>- Positive dipstick test, dipslide or urine culture&lt;br&gt;- Similar symptoms in recurrence&lt;br&gt;- Consider delayed prescription with nonpregnant, healthy women</td>
<td>- Uncomplicated UTI: nitrofurantoin&lt;br&gt;- Complicated UTI (with fever): ciprofloxacain</td>
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# Recommendations on antibiotic treatment in Dutch GP guidelines

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<td>palatoschisis, immunocompromised)</td>
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<td>- Recurrent fever</td>
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<td></td>
<td>- 4th recurrence</td>
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<td></td>
<td>- Immunocompromised</td>
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<td>- Immunocompromised</td>
<td>- In case of allergy: azithromycin</td>
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<tr>
<td></td>
<td>- Acute rheumatic disease</td>
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<td></td>
<td>- Streptococcus epidemic in closed community</td>
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<td>- Modest ill and:</td>
<td>- In case of contra-indications: macrolide</td>
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<tr>
<td></td>
<td>- Consider delayed prescription with nonpregnant, healthy women</td>
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</table>

*No, unless*
Comparison of international guidelines on acute sore throat

<table>
<thead>
<tr>
<th></th>
<th>European Guidelines</th>
<th>North American Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BE</td>
<td>NL</td>
</tr>
<tr>
<td><strong>Diagnosis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Centor criteria</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>- GABHS (rapid antigen or strep) test</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>- Culture</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Treatment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Prescribe antibiotics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- High-risk and very ill patients</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>- Centor criteria</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>- GABHS test result positive</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>- GABHS test result negative; culture positive</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>- Culture positive</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Reason for antibiotics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Shorten clinical evolution</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>- Prevent acute rheumatic fever</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>- Prevent glomerulonephritis</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>- Prevent local complications</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>- Limit spread of GABHS</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td><strong>Small-spectrum penicillin</strong></td>
<td>+</td>
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</table>

**Comparison of international guidelines on urinary tract infections**

<table>
<thead>
<tr>
<th>GERMANY</th>
<th>NETHERLANDS</th>
<th>NORWAY</th>
<th>BELGIUM</th>
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<tbody>
<tr>
<td><strong>DIAGNOSIS</strong></td>
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<tr>
<td>Symptoms + Urinalysis</td>
<td>Symptoms + Urinalysis</td>
<td>Symptoms ONLY</td>
<td>Symptoms + Urinalysis</td>
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<tr>
<td>Urinalysis</td>
<td>Urinalysis</td>
<td>Urinalysis</td>
<td>Urinalysis</td>
</tr>
<tr>
<td> Stick: Nitrite AND LE</td>
<td> Stick Nitrite (N)</td>
<td>NO Urinalysis</td>
<td> Stick Nitrite (N)</td>
</tr>
<tr>
<td>N AND LE Pos  UTI</td>
<td>N Pos  UTI</td>
<td></td>
<td>N Pos  UTI</td>
</tr>
<tr>
<td>N OR LE Neg  culture</td>
<td>N Neg  Dipslide-culture OR</td>
<td>Microscopic detection of bacteria in unspun urine</td>
<td>N Neg  LE-test</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>If N- AND LE-→ NO UTI</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>If N- AND LE+→ doubt; ask patient’s preference</td>
</tr>
<tr>
<td><strong>TREATMENT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selection:</td>
<td>Selection:</td>
<td>Selection:</td>
<td>Selection:</td>
</tr>
<tr>
<td>TMP 100mg 2dd</td>
<td>TMP 300mg 1dd</td>
<td>NO DRUG SELECTED</td>
<td>TMP 300mg 1dd</td>
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<tr>
<td>OR</td>
<td>OR</td>
<td></td>
<td>OR</td>
</tr>
<tr>
<td>NF 100mg 2dd</td>
<td>NF 50mg 4dd or 100mg 2dd</td>
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<td>NF 100 mg 3 dd</td>
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<tr>
<td>3 DAYS</td>
<td>3 DAYS</td>
<td>3 DAYS</td>
<td>3 DAYS</td>
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<tr>
<td>Failure:</td>
<td>Failure:</td>
<td>Failure:</td>
<td>Failure:</td>
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<tr>
<td>Change NF to TMP or vice versa for 10 days</td>
<td>Change NF to TMP or vice versa for 3 days</td>
<td>NO recommendations</td>
<td>Change NF to TMP or vice versa for 3 days</td>
</tr>
</tbody>
</table>

N = Nitrite test; LE = Leukocyte-esterase test; Pos = positive; Neg = negative; UTI= Urinary Tract Infection; NF = Nitrofurantoin; TMP = Trimethoprim

Implementation axioma’s

“Knowing is not enough, you must apply”
“Willing is not enough, you must do”

Goethe

“Evidence-based development should be followed by evidence-based implementation”

Grol
Evidence-based implementation

- Systematic approach to managing the quality of health care
- Use various dissemination and implementation strategies in combinations
- Consider professional, organizational, financial, regulatory incentives and disincentives
- Consider barriers and facilitators at both national and local levels (tailored implementation)

Factors influencing the implementation of change

• Factors related to the guideline
• Factors related to individual practitioners: knowledge, attitude, behavior
• Factors related to patients
• Factors related to the system: organisation, resources, financial infrastructure

Characteristics of effective guidelines

- Supported with scientific evidence
- Easy to follow and not too complex
- No need for new knowledge and skills
- Compatible with norms and values

Most perceived barriers to guideline adherence among Dutch GPs

- lack of knowledge regarding the guideline
- lack of agreement with recommendations
- patient preferences and patient behaviour
- system factors, such as organisational constraints

An example of a Dutch guideline on conjunctivitis: results from focus group

- **Barriers related to attitudes**
  - It is so easy to help patients with local antibiotics as these rarely give side effects
  - Prevention of bacterial resistance does not have an impact on individual patients

- **Barriers related to behaviour/external barriers**
  - Patients demand for prescription of antibiotics
  - Practice staff (responsible for phone consultation) has routines and habits
  - If no antibiotics are prescribed, patient may visit general practice out of hours (e.g., Friday afternoon)

How to improve guideline adherence?

• Guidelines should be more transparent concerning underlying evidence and applicability

• Interventions should be tailored to unique pattern of barriers of each key recommendation

• Focus groups could be used as an innovative medium for guideline education and implementation

An example of a Dutch guideline on conjunctivitis: results from focus group

Suggested interventions

- Training project for telephone consultations with practice-assistant
- Peer review and feedback from GP colleagues who successfully introduced a restrictive antibiotic prescription policy

Key factors for success

• National government supports primary healthcare
• Payment system supports primary care and integrated patient care
• Strong, well-accepted national professional organization
• Longstanding evidence-based guideline program
• Collaboration and local peer support are essential
I’m sure glad the hole isn’t in our end...