

# Antimicrobial resistance (AMR)

Steffen Amann,<sup>1</sup> Kees Neef,<sup>2</sup> Stephanie Kohl<sup>3</sup>

<sup>1</sup>Krankenhausapotheke (Hospital Pharmacy), Städtisches Klinikum München GmbH, München, Germany  
<sup>2</sup>Clinical Pharmacy & Toxicology, MUMC, Maastricht, Netherlands  
<sup>3</sup>Policy and Advocacy, European Association of Hospital Pharmacists, Brussels, Belgium

## Correspondence to

Ms Stephanie Kohl, Policy and Advocacy, European Association of Hospital Pharmacists, Brussels, 1200, Belgium; Stephanie.Kohl@eahp.eu

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## ABSTRACT

The position paper of the European Association of Hospital Pharmacists (EAHP) highlights the importance of the prudent use of antimicrobial drugs through antibiotic stewardship to ensure efficient therapy for patients with life-threatening infections. EAHP calls on national governments and health system managers to utilise the specialised background and knowledge of the hospital pharmacist in multi-professional antibiotic stewardship teams. In addition, the paper recommends the universal application of infection prevention and control measures among healthcare professionals. Due to the lack of funding, EAHP urges increased investment to support the development of innovative proposals and the encouragement of practice-based research projects to investigate new fields of infectious disease control such as immunotherapy and to optimise the cost-effectiveness of systems for surveillance on antibiotic use and resistance. In relation to the 'One Health approach' of the European Commission, EAHP strongly supports regulatory oversight and proper implementation of measures in the veterinary and agriculture sectors at European, national and local level.

## MAKING THE DIFFERENCE IN MEDICATION: PRUDENT USE OF ANTIMICROBIAL DRUGS THROUGH ANTIBIOTIC STEWARDSHIP (ABS) TO ENSURE EFFICIENT THERAPY FOR PATIENTS WITH LIFE-THREATENING INFECTIONS

Antibiotics and other antimicrobial drugs save lives. Scientific evidence has become widespread in policy and general knowledge: inadequate use and overuse of antimicrobials in human medicine, veterinary medicine and intensive livestock farming as well as pharmaceuticals in the environment endanger the potency and efficacy of antimicrobial agents. Development and increase of antimicrobial resistance (AMR) put patients with life-threatening infections at risk of therapeutic insufficiency.<sup>1,2</sup> In addition, the lack of newly developed antibiotics worsens the situation.

To maintain the efficacy of antimicrobial drugs and to prevent further spread of AMR, EAHP demands an interprofessional approach. Hospital pharmacists in Europe are ready to contribute and promote the prudent use of antimicrobial drugs through the enforcement of antibiotic stewardship (ABS). To improve patient outcomes proactive steps need to be taken. Consequently,

## Strengthening of antimicrobial/antibiotic stewardship (ABS) in human medicine

### Development and definition of ABS

In PubMed the first article using the term 'antimicrobial stewardship' in a title or abstract was in the 1997 *Guidelines for the prevention of antimicrobial*

*resistance in hospitals* published by the Society for Healthcare Epidemiology of America (SHEA) together with the Infectious Diseases Society of America (IDSA).<sup>3</sup> Over the following decade, only a very few publications using this term in a title or abstract can be found in PubMed. In 2007, SHEA and IDSA published the *Guidelines for developing an institutional program to enhance antimicrobial stewardship*.<sup>4</sup> ABS was described as an activity that includes appropriate selection, dosing, route, and duration of antimicrobial therapy. The primary goal of ABS is to optimise clinical outcomes while minimising unintended consequences of antimicrobial use. Core members of a multidisciplinary ABS team include an infectious diseases physician and a clinical pharmacist with infectious diseases training, with the inclusion of a clinical microbiologist and further specialists being optimal.

The first European adoption of the IDSA Guidelines based on a new evaluation of the literature including European publications was performed in 2013. Published in German by an interdisciplinary working group from Austria, Germany and Switzerland,<sup>5</sup> it was later translated into English<sup>6</sup> in order to reach a wider audience in Europe.

In subsequent years, the number of publications using the terms 'antimicrobial stewardship' or 'antibiotic stewardship' in a title or abstract increased rapidly to over 740 in 2017.<sup>7</sup> Some 30 years after the first publication, the concept of ABS has reached clinic practice and science.

## Need of further implementation of ABS programmes

ABS is still far away from being routine in European hospitals. This contrasts with the scientific results of efficient reduction of antibiotic overuse, positive contributions to resistance development and even cost savings through ABS.<sup>8</sup> The ECDC also supports the strengthening of the fight against AMR i.e. through an ABS toolkit, with one particular section identifying ABS as a role requiring hospital pharmacists' involvement.<sup>9</sup>

The European Commission strongly supports ABS as an important tool in their publications, for example, European Union (EU) guidelines for the prudent use of antimicrobials in human health.<sup>10</sup> Besides the positive effects on patient treatment and sustainability of antibiotic therapy, there is also a cost benefit described in the literature.<sup>11</sup>

The International Pharmaceutical Federation mentions as one point the important role of pharmacists in their statement of policy 'control of AMR',<sup>12</sup> recommending that pharmacists "conduct and translate research on all facets of AMR, including but not limited to biomedical, clinical, socio-behavioural, policy, diagnostics and antimicrobial medicines discovery for the optimal management of infections in the context of AMR and antimicrobial



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- ▶ **EAHP calls** on national governments and health system managers to utilise the specialised background and knowledge of the hospital pharmacists in multi-professional antibiotic stewardship teams.
- ▶ **EAHP recommends** universal application of infection prevention and control measures by the European Centre for Disease Prevention and Control (ECDC) and WHO among healthcare professionals.
- ▶ **EAHP strongly supports** regulatory oversight and proper implementation of measures in the veterinary and agriculture sectors at European, national and local levels.
- ▶ **EAHP urges** increased investment to support the development of innovative proposals and the encouragement of practice-based research projects to investigate new fields of infectious disease control such as immunotherapy and to optimise the cost-effectiveness of systems for surveillance on antibiotic use and resistance.
- ▶ **EAHP urges** governments to make arrangements that essential antibiotics will be maintained on the market with contingency stock level arrangements and alternative production by hospital pharmacists enabled where necessary.

stewardship in the One Health approach". This especially applies to hospital pharmacists in Europe and elsewhere.

A recent editorial of the *European Journal of Hospital Pharmacy* stated: "First we need to take personal responsibility and ask: 'What am I or my pharmacy doing to improve control of antimicrobials?' Second there is a need to ensure that an up-to-date antimicrobial policy is available and implemented, with pharmacists playing their part on the policy committee."<sup>13</sup>

**EAHP calls** on national governments and health system managers to use the specialised background and knowledge of the hospital pharmacists in multi-professional ABS teams.

### Further development of prophylactic measures like vaccination and hygiene

The efforts of prophylaxis like vaccination and hygiene are additional supportive, important and need to be further enhanced. Prevention of infectious diseases should be strengthened by integrating vaccination planning developed for the fight against AMR.<sup>14,15</sup> Similarly existing toolkits such as the one for healthcare professionals in hospitals and other healthcare settings of ECDC, to which EAHP contributed from the perspective of the hospital pharmacist, and hand hygiene as the single most important prophylactic measure, need to be further prompted.<sup>16,17</sup>

**EAHP recommends** universal application of infection prevention and control measures by ECDC and WHO among healthcare professionals.

### Aadequate use of antimicrobials in veterinary medicine and intensive livestock farming

There is strong evidence that the use of antimicrobial drugs in agriculture and aquaculture also induce AMR in human pathogenic bacteria. The consumption of antimicrobials by animals in the EU is at least double that for humans in tonnes of active substances (8.1 vs 3.8 t), and even significantly higher when comparing the biomass (147 vs 124 mg/kg).<sup>18</sup>

The European Commission has taken significant measures in the veterinary sector and defined guidelines that address the need for preventive measures at European, national and local levels.<sup>19</sup>

**EAHP strongly supports** regulatory oversight and proper implementation of measures in the veterinary and agriculture sectors at European, national and local levels.

### Lack of newly developed antibiotics and universal access to essential antibiotics

Due to increase of resistance (eg, carbapenem resistance in southern and eastern Europe) specific funding actions are necessary for the future benefit of patients.<sup>20</sup> In 2017, the WHO stated:

- ▶ The current clinical pipeline is insufficient against pathogens on the WHO priority pathogens list and tuberculosis
- ▶ More innovative approaches are required, but there are scientific challenges
- ▶ More work is required to fill the pipeline.<sup>21</sup>

Despite the commitments of the European Commission included in the One Health Action Plan in relation to the support of research and development, further incentives are needed.

**EAHP urges** increased investment to support the development of innovative proposals and the encouragement of practice-based research projects to investigate new fields of infectious disease control such as immunotherapy and to optimise the cost-effectiveness of systems for surveillance on antibiotic use and resistance.<sup>22</sup>

In addition to the development of new antibiotics, the universal access to old antibiotics that are being utilised in new ways needs to be ensured. Studies that gather further information on this scenario should be supported.<sup>23</sup> Medicines shortages of antimicrobial drugs endangers their prudent use and therefore should be avoided.

**EAHP urges** governments to make arrangements to ensure that essential antibiotics will be maintained on the market with contingency stock level arrangements and alternative production by hospital pharmacists enabled where necessary.

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