

Antimicrobial Stewardship Strategy:

Prescriber education

Education (formal or informal) to inform and engage prescribers and other health care professionals in stewardship activities and to improve antimicrobial prescribing.



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This is a PHO CORE strategy

Priority Level: A

Difficulty Level: 2

Program Stage:

- ✓ Early
- Intermediate
- Advanced

Antimicrobial Stewardship Outcomes:

- Drug utilization outcomes
- Prescribing outcomes
- Reduction of *Clostridium difficile* infection

For more information on these criteria and how they were developed, please see the [Antimicrobial Stewardship Strategy Criteria Reference Guide](#).

Updated June 2016

Description

This is an overview and not intended to be an all-inclusive summary. As a general principle, patients must be monitored by the health care team after changes to therapy resulting from recommendations made by the antimicrobial stewardship team.

Education to inform and engage prescribers and other health care professionals in stewardship activities and improve antimicrobial prescribing is a basic and essential antimicrobial stewardship strategy. However, in isolation, education has a minimal impact on prescribing behaviour. Education is most effective when paired with corresponding interventions and measurement of outcomes. Also, repetition of the educational message is necessary to sustain any impact.

Education efforts may be formal or informal. Formal education initiatives may include presentations, staff teaching sessions, written guidelines or policies, and email alerts and notices. Informal education can include ad hoc point-of-care teaching by stewardship personnel or [prospective audit and feedback](#) rounds.

Education can focus on antimicrobial stewardship principles in general, appropriate antimicrobial prescribing for specific infections or issues, and activities that support an antimicrobial stewardship program (e.g., importance of accurately identifying drug allergies; appropriate ordering of cultures; interpretation of culture and susceptibility results; criteria for use of specific antimicrobials; interpretation of the institutional antibiogram; use of institutional guidelines or order sets, appropriate documentation, feedback of audit results). Sufficient education should accompany the introduction of any new stewardship intervention.

Advantages

- Can result in moderate improvement in prescribing behaviour and acceptance of antimicrobial stewardship strategies.

Disadvantages

- Only limited efficacy for altering prescribing behaviour when used as sole intervention. Active strategies and combinations of strategies are more effective.
- Requires ongoing education to maintain the desired effect/behaviour.

Requirements

- Personnel—physicians or pharmacists—to conduct educational sessions.
- Initial investment of time to prepare information and need for repetition in order to sustain any impact.

Associated Metrics

- Number of staff who have received education.
- Before-and-after study of prescribing practices (e.g., number of patients on appropriate therapy or length of therapy).
- Pre- and post- survey of prescriber attitudes and/or knowledge of antimicrobial stewardship.

Useful References (updated June 2016)

Select articles to provide supplemental information and insight into the strategy described and/or examples of how the strategy was applied; not a comprehensive reference list. URLs are provided when materials are freely available on the Internet.

- Dellit TH, Owens RC, McGowan JE Jr, Gerding DN, Weinstein RA, Burke JP, et al. Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America guidelines for developing an institutional program to enhance antimicrobial stewardship. Clin Infect Dis. 2007;44(2):159–77. Available from: <http://cid.oxfordjournals.org/content/44/2/159.long>
- Nalule Y. Is physician education effective in promoting antibiotic stewardship? [Internet]. Arlington, VA: Society for Healthcare Epidemiology of America; February 2011 [cited 2015 Oct 20]. SHEA Policy Brief 11. Available from: https://www.shea-online.org/images/briefings/Policy_Brief_11.pdf
- Pulcini C, Gyssens IC. How to educate prescribers in antimicrobial stewardship practices. Virulence 2014;4(2):192–202.

Review of elements of education and strategies; focus on the need to start education early in the undergraduate curriculum of health professionals.

- Ohl CA, Luther VP. Health care provider education as a tool to enhance antibiotic stewardship practices. *Infect Dis Clin North Am.* 2014;28(2):177–93.

Discusses several aspects of education, including who should get it, who should provide it, what should be provided, effectiveness, behaviour science theory and strategies.

Tools and Resources

- Ø 1I TOOL: survey of staff attitudes toward ASP and current practices. [Internet]. Rockville, MD: Agency for Healthcare Research and Quality; September 2012 [cited 2015 Sep 23]. Available from: <http://www.ahrq.gov/professionals/quality-patient-safety/patient-safety-resources/resources/cdifftoolkit/cdiff12tools1i.html>

A sample questionnaire that may be used to survey prescribers' attitudes about antimicrobial resistance and stewardship, and to assess prescribing practices.

- Scottish Antimicrobial Prescribing Group (SAPG). Education [Internet]. Glasgow, UK: Scottish Medicines Consortium; [cited 2015 Sep 23]. Available from: <http://www.scottishmedicines.org.uk/SAPG/Education/Education>

SAPG offers training materials on antimicrobial stewardship for health care professionals, as well as links to resources on antimicrobial resistance and other topics.

- Mount Sinai Hospital and University Health Network Antimicrobial Stewardship Program. Antimicrobial stewardship: best practices [Internet]. Toronto, ON: Mount Sinai Hospital, University Hospital Network; c2015 [cited 2015 Sep 23]. Available from: <http://www.antimicrobialstewardship.com/article-category/antimicrobial-stewardship-best-practices>

Examples of education modules about the management of a variety of infections.

- Mount Sinai Hospital and University Health Network Antimicrobial Stewardship Program. Why is antimicrobial stewardship important? [video on the Internet]. Toronto, ON: Mount Sinai Hospital-University Health Network; 2013 Nov 15 [cited 2015 Nov 4]. Available from: <https://www.youtube.com/watch?v=-G4cEYQBVu4>

Video describing the growing burden of antimicrobial resistance and the importance of appropriate antimicrobial use.

- Mount Sinai Hospital and University Health Network Antimicrobial Stewardship Program. Managing hospital acquired pneumonia / ventilator associated pneumonia in the ICU. [video on the Internet]. Toronto, ON: Mount Sinai Hospital-University Health Network; 2014 Jan 24 [cited 2015 Nov 4]. Available from: <https://www.youtube.com/watch?v=RueE4or4rMU>

Video describing the diagnosis and treatment of hospital and ventilator-associated pneumonia.

- Lakeridge Health, Antimicrobial Stewardship Program. Selective pressure WebApp [Internet]. Oshawa, ON: Lakeridge Health; [cited 2015 Nov 4]. Available from: <https://selectivepressureapp.wordpress.com/>

Includes treatment summaries and clinical pearls for common infections.

Samples/Examples

- [Example 1: The Ottawa Hospital – “Coagulase Negative Staphylococcus: To Treat or Not To Treat...” - Info Pharm; May-June 2006.](#)
- [Example 2: The Ottawa Hospital – “Antimicrobial Stewardship: Preserving Our Antibiotic Resources at The Ottawa Hospital”. Info Pharm; January-March 2012](#)
- [Example 3: Sunnybrook Health Sciences Centre - UR ine for a Surprise! Poster Series](#)
- [Example 4: Halton Healthcare - New Pharmacist Orientation Guide at HHS. Organizational Pharmacy Core Competencies: Antimicrobial Stewardship](#)

These documents have been generously shared by various health care institutions to help others develop and build their antimicrobial stewardship programs. We recommend crediting an institution when adopting a specific tool/form/pathway in its original form.

Examples that contain clinical or therapeutic recommendations may not necessarily be consistent with published guidelines, or be appropriate or directly applicable to other institutions. All examples should be considered in the context of the institution’s population, setting and local antibiogram.

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Links with Other Strategies

Education is required for any stewardship activity introduced; this strategy is linked with most other strategies.

- [Prospective audit with intervention and feedback](#)

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For further information


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Example 1: The Ottawa Hospital – “Coagulase Negative Staphylococcus: To Treat or Not To Treat...” - Info Pharm; May-June 2006

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	Drug Information Services / Service d'information pharmacothérapeutique <small>General Campus Général Civic Campus Civic 501 chemin Smyth Road, 1053 av. Carling Ave. Ottawa, Ontario K1H 8L6 Ottawa, Ontario K1Y 4E9 (613) 737-8347, 1-800-267-4707 (613) 798-5555 ext. 16683</small>
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www.asksam.com/ovrdis/ Date: May-Aug 2006 Vol. VII No. 3	

PHARMACOTHERAPY

COAGULASE NEGATIVE STAPHYLOCOCCUS: TO TREAT OR NOT TO TREAT...

Introducing the troublesome bacteria:

The group of bacteria known as coagulase negative staphylococcus (CoNS) encompasses a variety of species, of which *Staphylococcus epidermidis* is the most common. Although they resemble *Staphylococcus aureus* (SA) on gram stain (gram-positive coccus in clusters), they differ from SA in a number of ways, as they: 1) do not produce the enzyme coagulase, 2) are always part of the normal skin flora, and 3) are less virulent.^{1,2}

CoNS are not usually considered pathogens when cultured from non-sterile sites (e.g., wounds). In addition, approximately 80 percent of blood cultures with CoNS isolated are thought to represent contamination.³ This contamination may originate from either the skin of the patient or hospital personnel (e.g., phlebotomist, lab personnel). Over the years, however, CoNS have become an important cause of true bacteremia, and are now responsible for approximately 20 to 30 percent of nosocomial bloodstream infections in adults.^{4,5} This is due to the increased use of prosthetic devices, including central venous catheters (CVCs), in contemporary medicine. CoNS have the propensity to adhere to foreign material and produce a protective biofilm, or “slime”, with subsequent proliferation and bacteremia.^{1,2}

As a result, clinicians are frequently faced with the decision of whether or not to treat patients with blood cultures growing CoNS. Treatment of contaminated cultures results in unnecessary antibiotic prescribing, particularly vancomycin, as CoNS are frequently resistant to other antibiotics.

Considerations for Blood Culture Interpretation:

Various studies have tried to identify factors which will help the practitioner determine the clinical significance of positive blood cultures with CoNS. These factors include the number of positive cultures, the time to positive culture, species, and antibiograms. Although somewhat useful when considered together, none of these variables are unequivocally reliable.⁶

When assessing the significance of positive cultures, clinicians should take into account the following considerations:

- 1) Clinical status of the patient: does the patient have signs/symptoms of infection?
- 2) Does the patient have a risk factor (prosthetic material) to explain the bacteremia with CoNS: (e.g., CVC; hemodialysis catheter, shunt or graft; vascular graft; prosthetic cardiac valves; pacemaker; prosthetic joint or hardware, especially if new; or urinary stent)?^{7,8}
- 3) Number of positive blood cultures (Note: when blood is inoculated into one or more bottles from the same venipuncture, it is considered to be a single culture, often referred to as a set when >1 bottle is inoculated). Although the number of positive cultures is often used to determine the significance of CoNS, (i.e., 2 positive cultures are more likely to be significant than a single positive culture), it is important to note that a single positive culture is not necessarily insignificant (if a patient has a risk factor).⁶ On the other hand, multiple positive cultures can represent contamination. For example, in one study, 55 percent of patients with two or more positive blood cultures for CoNS had different strains identified by molecular typing, suggesting contamination.⁷ It is also important to emphasize that the number of blood culture *bottles* that are positive per culture set cannot reliably predict clinical significance and should not be used as a criterion for determining whether or not an isolate represents true infection or contamination.
- 4) Does the patient have signs of endocarditis? (Infection of native cardiac valves with CoNS is quite rare, but still possible, and should be considered in patients with multiple positive cultures, even in the absence of a risk factor.)¹

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Example 1: The Ottawa Hospital – “Coagulase Negative Staphylococcus: To Treat or Not To Treat...” - Info Pharm; May-June 2006 (continued)

The Importance of Proper Collection of Blood Cultures :

Proper collection of blood cultures aids in the interpretation of results for CoNS by providing the appropriate number of samples for evaluation. At The Ottawa Hospital (TOH), therefore, when blood cultures are ordered, nurses should be drawing two blood cultures, each from a different site. The first culture consists of an aerobic and anaerobic bottle, and the second culture consists of an aerobic bottle. Strict attention to adequate skin disinfection with chlorhexidine/alcohol prior to venipuncture is essential. Ideally, two peripheral cultures should be drawn, but if this is not feasible and the patient has a central line, one of the cultures may be drawn through the central line. Peripheral cultures are preferred because blood cultures obtained through an indwelling line are twice as likely to grow a contaminant than a culture obtained by venipuncture.⁸ More information regarding TOH recommendations for the proper collection of blood cultures can be found in the Microbiology section of the Laboratory Manual (pages 40-42) under the Pathology and Laboratory Medicine Department of the Infonet.

Positive cultures of catheter tips from deep intravascular lines can also be a source of confusion, especially in conjunction with negative blood cultures. A “positive tip culture” (i.e., >15 colonies of a microorganism) is not diagnostic of a catheter-related infection. It only indicates colonization of the catheter. Simultaneous blood cultures are required to assess for possible bacteremia. Although catheter tips are frequently colonized with CoNS at the time of removal, only a small percentage actually result in bacteremia.²

Experience at The Ottawa Hospital:

A review was performed at TOH to evaluate the management approach to positive CoNS cultures of blood and CVC tips in immunocompetent patients. Based on predetermined criteria, CoNS bacteremias were classified as definite bacteremia, probable contamination, or indeterminate. Similarly, the results of positive CVC tips were categorized as definite or probable line infection, colonization only, or indeterminate. All “indeterminate” cases were reviewed by an Infectious Disease (ID) physician for further classification.

Culture results: From May to September 2004, 167 positive cultures for CoNS in 145 patients were assessed. These included cultures from blood (51.5%), catheter tips (42%), and both blood and catheter tips (6.5%). Of patients with positive blood cultures, 14.4 percent were considered to have a true bacteremia based on study definitions, 53.6 percent fit the definition for contamination, and 32 percent required review by an ID physician to determine significance. Therefore, the significance of the culture was not clearly evident in almost one third of cases. However, of the indeterminate blood cultures, 77 percent were considered to be contamination after review by the ID physician.

Antibiotic Use: Antibiotics were prescribed in all cases of definite infection, but also in 34 percent of contaminated cultures (includes both blood and catheter tips), resulting in 239 days of unnecessary antibiotic use, the majority (188 days) of which was vancomycin.

Other observations from the study:

- Of 183 blood cultures performed, 72 (39.3%) had only one blood culture drawn.
- Of 92 catheter tips cultured, 41 (44.5%) did not have blood cultures drawn within 48 hours of the tip culture.
- Of the 13 “colonized” catheter tip cultures treated with antibiotics, eight did not have any associated blood cultures drawn, and the other five had blood cultures drawn, but with negative results.

Approach and Recommendations:

From these results, the following recommendations can be made:

- Catheter tips should not be sent for culture when lines are removed unless there is a suspicion of a catheter-related bloodstream infection. If this is the case, two blood cultures from two different sites and drawn as described above should also be obtained.
- Positive catheter tips for CoNS in the absence of positive blood cultures should not be treated.
- If the clinical significance of a blood culture for CoNS is uncertain and antibiotics have not yet been started, two blood cultures should be repeated. Antibiotics may be started or withheld pending repeat culture results, based on the level of suspicion and clinical picture of the patient.

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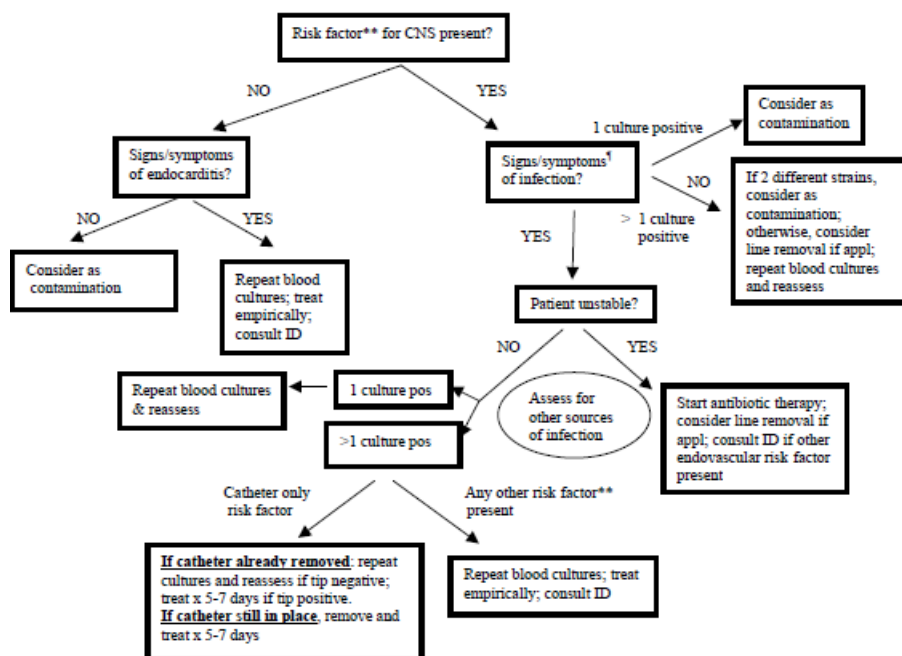
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Example 1: The Ottawa Hospital – “Coagulase Negative Staphylococcus: To Treat or Not To Treat...” - Info Pharm; May-June 2006 (continued)

The following algorithm may help clinicians in the approach to the management of patients with positive blood cultures for CoNS:

Coagulase Negative Staphylococci Assessment Algorithm

Blood Culture(s) Positive For Coagulase Negative Staphylococci (CoNS):



**Risk factors for CNS include presence of: intravascular catheters, hemodialysis catheters, vascular grafts, recent prosthetic joints or hardware, presence of a pacemaker, prosthetic cardiac valves.

† Signs/symptoms of infection include any 2 of: increased temperature $>38.3^{\circ}\text{C}$, increased white blood cells, respiratory rate, signs of local inflammation; or any one of: unexplained hypotension, disseminated intravascular coagulation

N.B. a single venipuncture represents one culture, but may consist of an aerobic and anaerobic bottle.

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Example 1: The Ottawa Hospital – “Coagulase Negative Staphylococcus: To Treat or Not To Treat...” - Info Pharm; May-June 2006 (continued)

Conclusion

Clinical judgment is required for interpretation of the significance of CoNS blood cultures or CVC tips, as there are minimal validated criteria to guide the clinician. The included algorithm can act as an aid in the interpretation of positive cultures, and may help minimize the unnecessary prescribing of antibiotics.

References:

1) Archer GL. *Staphylococcus epidermidis* and other Coagulase-Negative Staphylococci. In: Mandell GL, Bennett JE, Dolin R, editors. *Principles and Practice of Infectious Disease*. 5th ed. Philadelphia: Churchill Livingstone;2000:2092-100. 2) Rupp ME, *et al.* *Clin Infect Dis* 1994;19:231-45. 3) Thylefors JD, *et al.* *Infect Control Hosp Epidemiol* 1998;19:581-9. 4) Diekema DJ, *et al.* *Int J Antimicrob Agents* 2002;20:412-8. 5) Wisplinghoff H, *et al.* *Clin Infect Dis* 2004;39:309-17. 6) Herwaldt LA, *et al.* *Clin Infect Dis* 1996;22:14-20. 7) Seo SK, *et al.* *Am J Med* 2000;109:697-704. 8) Everts RJ, *et al.* *J Clin Microbiol* 2001;39:3393-4.

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PHARMACOTHERAPIE

LES STAPHYLOCOQUES À COAGULASE NÉGATIVE : TRAITER OU NE PAS TRAITER...

Présentation de la bactérie problématique

Le groupe de bactéries appelées staphylocoques à coagulase négative (SCoN) comprend diverses espèces, la plus courante étant le *Staphylococcus epidermidis*. Malgré leur ressemblance au *Staphylococcus aureus* (SA) à la coloration de Gram (amas de coques gram-positives), ils se distinguent de diverses façons du SA : 1) ils ne produisent pas de coagulase, une enzyme, 2) ils font toujours partie de la flore cutanée normale, et 3) ils sont moins virulents^{1,2}.

Les SCoN ne sont généralement pas considérés comme des pathogènes lorsqu'ils apparaissent à la culture d'échantillons non stériles (p.ex. plaies). De plus, on estime qu'environ 80 pour cent des hémocultures positives quant aux SCoN sont le fait d'une contamination³. Ces contaminants peuvent provenir de la peau du patient ou de celle du personnel de l'hôpital (p.ex. phlébotomiste, personnel du laboratoire). Au fil des ans, cependant, les SCoN sont devenus une cause importante de bactériémie véritable et sont maintenant impliqués dans environ 20 à 30 pour cent des bactériémies nosocomiales chez l'adulte^{4,5}. Cette situation s'explique par le recours accru de la médecine moderne à des prothèses, notamment à des cathétères veineux centraux (CVC). Les SCoN ont tendance à adhérer aux matériaux externes et à produire une pellicule ou un « film » biologique, entraînant prolifération et bactériémie^{1,2}.

En conséquence, les cliniciens doivent souvent décider s'ils vont ou non traiter lorsqu'il y a des SCoN dans les hémocultures de leurs patients. Le traitement subséquent à la contamination des hémocultures entraîne des ordonnances inutiles d'antibiotiques, en particulier de vancomycine, puisque les SCoN sont souvent résistants aux autres antibiotiques.

Éléments à envisager lors de l'interprétation des hémocultures

On a tenté, dans plusieurs études, de déterminer les facteurs qui pourraient aider le praticien à déterminer la signification clinique d'une hémoculture positive quant aux SCoN. Ces facteurs comprennent le nombre d'hémocultures positives, le délai pour le résultat positif de l'hémoculture, l'espèce et les antibiogrammes. Même si ces facteurs peuvent être d'une certaine utilité lorsqu'ils sont pris en compte ensemble, on ne peut se fier sans équivoque à aucune de ces variables⁷.

Quand ils évaluent l'importance des cultures positives, les cliniciens doivent prendre en compte les éléments suivants :

1. État clinique du patient : le patient présente-t-il des signes ou symptômes d'infection?
2. Facteurs de risque : le patient est-il porteur d'un facteur de risque (appareil prosthétique) qui expliquerait la bactériémie à SCoN (p. ex. CVC; cathéter d'hémodialyse, anastomose ou greffe; greffe vasculaire; prothèse valvulaire cardiaque; stimulateur cardiaque; prothèse ou implant articulaire, surtout récent; ou endoprothèse urinaire)^{1,2}?
3. Nombre d'hémocultures positives (Note : même si du sang provenant de la même ponction veineuse est inoculé dans plus d'un flacon, on considère qu'il s'agit d'une seule hémoculture, souvent appelée « ensemble » (set) lorsque plus d'un flacon est inoculé). Même si le nombre d'hémocultures positives sert souvent à déterminer l'importance des SCoN présents, (c.-à-d. que deux hémocultures positives sont probablement plus significatives qu'une seule hémoculture positive), il faut souligner qu'une seule hémoculture positive n'est pas nécessairement sans importance (si le patient est porteur d'un facteur de risque)⁶. D'autre part, de multiples hémocultures positives peuvent résulter d'une contamination. Dans une étude, par exemple, 55 pour cent des patients qui avaient deux hémocultures positives ou plus quant aux SCoN présentaient différentes souches, identifiées par typage moléculaire, ce qui suggère une contamination⁷. Il faut aussi insister sur le fait que le nombre de flacons positifs lors d'une même hémoculture ne constitue pas un indice fiable de son importance clinique et que ce critère ne peut pas servir à déterminer si un isolat représente une véritable infection ou une contamination.

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4. Le patient présente-t-il des signes d'endocardite? (L'infection à SCoN de valvules cardiaques endogènes est plutôt rare, mais néanmoins possible, et doit être envisagée à la suite de multiples hémocultures positives chez un patient, même en l'absence de facteur de risque¹.)

L'importance d'un prélèvement adéquat d'échantillons d'hémoculture

Un prélèvement bien fait des échantillons d'hémoculture facilite l'interprétation des résultats quant aux SCoN en fournissant le nombre approprié d'échantillons à analyser. À L'Hôpital d'Ottawa (HO), les infirmières doivent donc prélever deux échantillons, de deux endroits différents, lorsque qu'une hémoculture est demandée. Le premier échantillon est prélevé dans un flacon aérobie et anaérobie, alors que le deuxième échantillon est prélevé dans un flacon aérobie. Il faut faire très attention de bien désinfecter la peau avec de la chlorhexidine ou de l'alcool avant la ponction veineuse. Idéalement, deux échantillons d'hémoculture périphériques doivent être prélevés, mais si c'est impossible et que le patient a un cathéter central, un des échantillons peut être prélevé de cet endroit. Les échantillons périphériques sont préférables parce que les cultures faites à partir de sang prélevé d'un cathéter central risquent deux fois plus de susciter la culture d'un contaminant que les hémocultures faites à partir d'un échantillon prélevé par ponction veineuse⁸. On trouvera des renseignements complémentaires dans l'infonet sous l'onglet Département de pathologie et de médecine de laboratoire à la section « Microbiology » du « Laboratory Manual » (pages 40 à 42).

Une culture du bout du cathéter intravasculaire installé en profondeur peut aussi être source de confusion, particulièrement en association avec une hémoculture négative. Une « culture positive » (c.-à-d. >15 colonies d'un microorganisme) n'est pas diagnostique d'une infection reliée au cathéter. Ce n'est qu'un indice de colonisation du cathéter. Des hémocultures simultanées sont requises pour évaluer s'il pourrait s'agir d'une bactériémie. Même si les bouts des cathéters sont souvent colonisés par des SCoN au moment de leur retrait, il n'en résulte de fait qu'un faible pourcentage de bactériémie².

Expérience acquise à L'Hôpital d'Ottawa

Une revue a été menée à L'HO pour évaluer l'approche de gestion des hémocultures positives quant aux SCoN chez les patients immunocompétents. Les bactériémies liées à des SCoN ont été classées à l'aide de critères prédéterminés, en bactériémie véritable, contamination probable ou cas indéterminé. Parallèlement, les résultats positifs à la culture des bouts des CVC ont été qualifiés d'infection véritable ou probable liée au cathéter, de colonisation seulement ou de cas indéterminé. Un infectiologue a revu tous les « cas indéterminés » afin de les classer plus précisément.

Résultats de culture : De mai à septembre 2004, 167 cultures positives pour SCoN chez 145 patients ont été évaluées. Ces analyses comprenaient des hémocultures (51,5 %), des cultures de bouts de cathéter (42 %), ainsi que des cultures à la fois de sang et de bouts de cathéter (6,5 %). Chez les patients dont les hémocultures étaient positives, 14,4 pour cent ont été qualifiés de porteurs d'une bactériémie véritable selon les définitions de l'étude, 53,6 pour cent correspondaient à la définition de contamination et 32 pour cent ont dû être revus par un infectiologue pour en déterminer l'importance. La signification des hémocultures n'était donc pas claire dans près du tiers des cas. Parmi les cas non déterminés, toutefois, 77 pour cent ont été qualifiés de cas de contamination après l'examen de l'infectiologue.

Ordonnance d'antibiotiques : Des antibiotiques ont été prescrits dans tous les cas d'infection véritable, mais aussi dans 34 pour cent des cas de cultures contaminées (incluant sang et bouts de cathéter), entraînant 239 jours d'antibiothérapie inutile, la plupart du temps sous vancomycine (188 jours).

Autres observations lors de l'étude :

- Des 183 hémocultures, 72 (39,3 %) étaient des hémocultures uniques.
- Des 92 cultures de bouts de cathéter, 41 (44,5 %) n'ont été accompagnées d'aucune hémoculture dans les 48 heures suivant la culture du bout du cathéter.
- Des 13 patients chez qui le bout du cathéter était « colonisé » et qui ont été traités par antibiotique, huit n'ont fait l'objet d'aucune hémoculture et les cinq autres ont fait l'objet d'une hémoculture dont les résultats ont été négatifs.

Approche et recommandations :

À la lumière de ces résultats, voici les recommandations que nous pouvons formuler :

- Ne pas demander de culture du bout du cathéter au moment du retrait de ce dernier à moins d'un soupçon de bactériémie reliée au cathéter. Dans un tel cas, deux hémocultures prélevées à deux endroits différents selon la description ci-dessus doivent aussi être faites.
- Ne pas traiter les patients si les résultats de la culture du bout du cathéter sont positifs quant aux SCoN en l'absence d'une hémoculture positive.
- Si l'importance clinique d'une hémoculture quant aux SCoN est incertaine et qu'aucune antibiothérapie n'a encore été instaurée, répéter deux hémocultures. On peut instaurer l'antibiothérapie ou attendre les résultats des hémocultures répétées, compte tenu du poids des soupçons et de l'état clinique du patient.

6

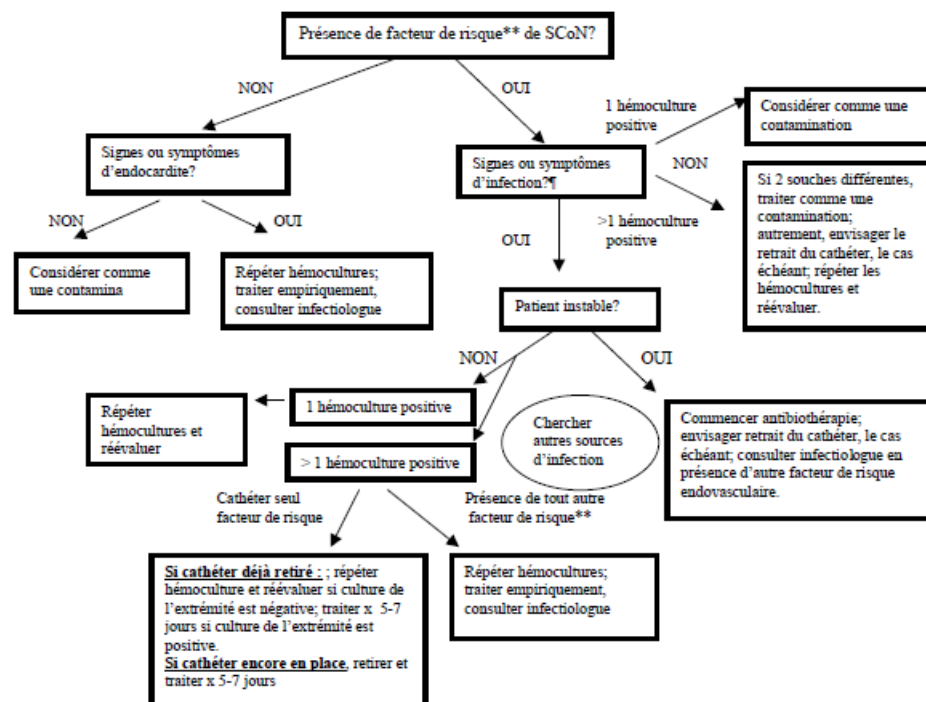
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Example 1: The Ottawa Hospital – “Coagulase Negative Staphylococcus: To Treat or Not To Treat...” - Info Pharm; May-June 2006 (continued)

Algorithme d'évaluation des staphylocoques à coagulase négative (SCoN)

Hémoculture(s) positive(s) pour SCoN



**Les facteurs de risque de SCoN sont les suivants : présence de cathéter intravasculaire, cathéter d'hémodialyse, greffe vasculaire, prothèse ou implant articulaire récent, présence d'un stimulateur cardiaque ou d'une prothèse valvulaire cardiaque.

† Les signes et symptômes d'infection comprennent 2 critères quelconques parmi les suivants : hausse de la température >38,3 °C, augmentation des leucocytes, de la fréquence respiratoire, signes d'inflammation localisée; hypotension inexpliquée ou coagulation intravasculaire disséminée.

N.B. une ponction veineuse représente une seule hémoculture, mais l'échantillon peut avoir été réparti dans un flacon aérobie et un flacon anaérobie.

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Example 1: The Ottawa Hospital – “Coagulase Negative Staphylococcus: To Treat or Not To Treat...” - Info Pharm; May-June 2006 (continued)

Conclusion

L'interprétation des hémocultures ou des cultures de bout de cathéter positives quant aux SCoN repose sur le jugement clinique, compte tenu du peu de critères validés pouvant guider le clinicien. L'algorithme ci-joint peut aider à l'interprétation de cultures positives et pourrait contribuer à réduire les ordonnances inutiles d'antibiotiques.

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www.asksam.com/ovrdis/ Date: January-March 2012		
PHARMACOTHERAPY	ANTIMICROBIAL STEWARDSHIP: PRESERVING OUR ANTIBIOTIC RESOURCES AT THE OTTAWA HOSPITAL	

*"We must recognize that the misuse of antibiotics affects the cost of medical care and the ecology of the bacterial flora. These are matters of concern to all physicians because the practice of one affects all."*¹
(Kunin CM, et al., 1973).

WHY ANTIMICROBIAL STEWARDSHIP?

Antimicrobials are life-saving drugs and have revolutionized the management of infections since penicillin was used clinically in the 1940's. Today, antimicrobials are frequently prescribed with an estimated 30 to 60 percent of hospitalized patients receiving at least one dose of antimicrobial. For patients in Intensive Care Units (ICUs), this figure is closer to 70 percent.³⁻⁵ Retrospective reviews have consistently shown that up to 50 percent of antibiotic prescribing may be suboptimal.^{4,6-8} Unnecessary or inappropriate antimicrobial prescribing can compromise patient outcomes, expose a patient to side effects and drug interactions, promote an environment that facilitates the induction and emergence of resistant organisms, and results in a significant increase in costs.

Unfortunately, the utility of our antibiotic armamentarium is constantly threatened by increasing antibiotic resistance, a problem faced worldwide. In addition, it is unlikely that new antimicrobial agents effective against many of the resistant organisms of concern will be available in the near future.⁹ Extrapolating from US data, an estimated 220,000 patients develop a hospital-acquired infection each year in Canada.¹⁰ Hospital-acquired infections are increasingly caused by resistant organisms. Patients with serious infections due to multi-drug resistant bacteria have a longer length of stay, higher mortality rate, and significantly increased healthcare costs compared to patients with infections due to more susceptible bacteria.¹¹ For example, patients with a bloodstream infection (bacteremia) with a resistant gram negative bacteria producing extended-spectrum beta-lactamase (ESBL) had a higher mortality rate (35% vs. 16%) and longer length of stay following the bacteremia (11 vs. 5 days) compared to patients with bacteremia due to a non-ESBL producing bacteria. The estimated additional cost per patient in this study was \$9,620 USD.¹²

Infection prevention and control measures, along with antimicrobial stewardship (AS), are the two main strategies to limit antimicrobial resistance.⁹

WHAT IS ANTIMICROBIAL STEWARDSHIP?

"Stewardship" is "the careful and responsible management of something entrusted to one's care".¹³ Antimicrobial stewardship has been defined in many ways; however, the key message is always the same: a coordinated effort to ensure the judicious and effective use of antimicrobials. Ideally, this involves the ongoing assessment of the need for, the choice, the dose, the route, and the duration of antimicrobial therapy. The primary goals of AS are to optimize patient clinical outcomes while minimizing the unintended consequences of antimicrobial use, such as toxicity, super-infections (e.g., *C. difficile* infection), and the emergence of resistance.^{6,8} Reducing health care costs without adversely affecting the quality of care is a secondary goal of AS.⁶

The concept of AS is not new; however, this activity is becoming increasingly recognized as an important component of patient care, particularly in the hospital setting. Many associations and agencies are advocating for formal antimicrobial stewardship programs (ASPs) to promote judicious antimicrobial use, improve patient care,

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and contain the development of antibiotic resistance. These include: 1) Ontario Public Health and The Ontario Hospital Association¹⁴; 2) Accreditation Canada (an ASP is now a required organizational practice for acute care institutions)¹⁵; 3) in the USA, The Infectious Disease Society of America (IDSA), The Society of Healthcare Epidemiology of America (SHEA), and the Center for Disease Control (CDC)^{6,8}; 4) The World Health Organization (WHO)¹⁶; and 5) various national government bodies.

In 2007, IDSA and SHEA published guidelines for the development of ASPs in the institutional setting, recognizing that ASP activities benefit both patient outcomes as well as help limit antibiotic resistance.⁶

ANTIMICROBIAL STEWARDSHIP PROGRAMS

Antimicrobial stewardship programs are formal, coordinated, multi-disciplinary efforts to monitor, manage, and optimize antimicrobial use, with the ultimate goal of improving patient outcomes. The primary team is typically an Infectious Diseases (ID) physician and pharmacist(s), whose main role is to work with clinical teams to provide education and guidance to optimize patient-specific antimicrobial therapy. Infection Control practitioners, Microbiology, hospital administration, and information technology also play a vital role in successful ASPs.⁶

Active AS strategies, namely concurrent (during active treatment) review with feedback to the prescriber, and antimicrobial restriction with preauthorization, have been shown to be the most successful in improving antimicrobial use.⁶ These activities may be supplemented by education, guideline and pathway development, intravenous to oral conversion programs, and resistance surveillance and selective susceptibility reporting by the microbiology laboratory.

Although the focus of earlier reports of AS activities was often cost savings, the more recent literature of ASPs has examined a variety of outcomes, including appropriateness of prescribing, expenditures, antibiotic resistance, and clinical outcomes. Most of these studies reported economic benefits; some have shown improvements in resistance and patient outcomes such as a reduced incidence of *C. difficile* infection. There were considerable differences in these studies with respect to type of facility or patient population, type of activity, and outcomes.^{17,18}

More recent reports include implementation of a concurrent review and feedback ASP in a 12-bed community hospital ICU in Toronto. The program resulted in a significant decrease (39%) in anti-pseudomonal antibiotics, costs (decrease of 36% per patient day) and rates of nosocomial *C. difficile*, compared to the same time period in the year prior to ASP implementation. Severity of illness and ICU mortality rate were similar before and after implementation.¹⁹ In another trial examining the impact of an ASP in an internal medicine service, teams were randomly assigned to intervention by an ASP versus standard availability of prescribing guidelines. Patients prescribed one of three specific antibacterials (i.e., piperacillin-tazobactam, vancomycin, or levofloxacin) were assessed. A significantly higher proportion of prescribing was deemed appropriate in the ASP group compared to controls (guidelines only), with an associated lower median duration of inappropriate antibiotic use (2 vs. 5 days, $p<0.001$). Compared with patients in the control group, patients in the intervention group had a similar mortality rate, but a significantly shorter median length of hospital stay.²⁰

ANTIMICROBIAL STEWARDSHIP PROGRAM AT TOH

Although current efforts and activities at The Ottawa Hospital (TOH) encourage appropriate antibiotic use, a dedicated ASP was recommended by the Antimicrobial Subcommittee of the Pharmacy and Therapeutics Committee to achieve further improvements. A formal ASP was recently approved by Senior Management and commenced in the fall of 2011. The TOH ASP team consists of two part time pharmacists with support from an ID physician.

The vision, mission, and goals of the new program are presented in Figure 1. A ward-based approach, using a General Medicine ward at the General campus and the ICU at the Civic campus, was selected for the first phase of the program. Prospective review with real-time feedback to the prescribing team, one of the two primary activities recommended by the IDSA/SHEA guidelines, was selected as the desired strategy. This method encourages the ongoing assessment of antimicrobial therapy, as opposed to an initial assessment only. Program evaluation and outcomes will include antimicrobial drug costs and usage, rates of *C. difficile*, and the percentage of recommendations accepted. Interim results indicate that the most frequent types of recommendations to date made by the ASP include discontinuation of antibiotics (not or no longer required, sufficient duration of therapy), ‘de-escalation’ (selecting an agent with a narrower spectrum of activity, often based on culture results), and optimizing the dose or route.²¹ The program has been well received to date and plans to expand the program within the hospital are underway.

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ANTIMICROBIAL STEWARDSHIP: WHAT CAN YOU DO?

In order to be successful, AS must be a corporate commitment. All hospital staff can participate in AS by embracing the culture and making the optimization of antimicrobial use a priority within the hospital. Other actions which can impact antimicrobial use include: 1) reassessing and eliminating catheters (e.g., urinary, intravenous) that are no longer required; 2) accessing expertise (e.g., consulting ID); 3) obtaining cultures before antibiotics are initiated; 4) regularly reviewing the ongoing need in patients prescribed antimicrobials, with regular reminders by nurses and pharmacists; 5) promoting vaccination; 6) participating in the development and following infection treatment guidelines based on local resistance patterns (consult the TOH Antibigram and TOH Guidelines for Empiric Therapy available under “Resources” on vOasis); and 7) documenting the rationale and plan for antimicrobial therapy in the patient’s chart.^{8,22} (A recent review indicated that documentation for patients prescribed antibiotic therapy at TOH was suboptimal).²³

CONCLUSION

Antimicrobial resistance, coupled with a diminishing pipeline of new antimicrobial agents, is both a local and global concern. Antibiotic stewardship programs are increasingly being advocated worldwide as a means to promote judicious antimicrobial use, improve patient safety, and contain the development of antibiotic resistance. Although over 35 years old, the introductory quote in this document is even more pertinent today. Antimicrobial stewardship is pivotal in preserving the future utility of antimicrobial agents.

Figure 1: TOH Antimicrobial Stewardship Program: Vision, Mission, and Goals

Vision:	
To be a recognized leader in achieving and promoting excellence in the appropriate use of antimicrobial agents.	
Mission:	
1)	To improve patient outcomes and safety by enhancing the quality of antimicrobial prescribing
2)	To advance the knowledge and skills of health care professionals in prescribing antimicrobials and promote the importance of stewardship
3)	To identify research opportunities and assess novel interventions in order to advance the direction of antimicrobial stewardship
Goals:	
1)	Optimize clinical outcomes of patients treated with antimicrobial agents
2)	Reduce adverse events related to antimicrobial use
3)	Impede the rise of antimicrobial resistance
4)	Enable more cost-effective antimicrobial prescribing practice
5)	Achieve sustained improvements in antimicrobial prescribing practices
6)	Evaluate and disseminate methods and measures to improve antimicrobial stewardship

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PHARMACOTHÉRAPIE

GESTION DE L'UTILISATION DES ANTIMICROBIENS : PRÉSERVER NOS RESSOURCES ANTIBIOTIQUES À L'HÔPITAL D'OTTAWA

« Nous devons reconnaître que le mauvais usage des antibiotiques a une incidence sur le coût des soins médicaux et sur l'écologie de la flore bactérienne. Il s'agit de questions d'intérêt pour tous les médecins puisque la pratique d'un médecin a des répercussions sur tout le monde. »¹ (Kunin C.M. et coll., 1973). (Traduction)

POURQUOI GÉRER L'UTILISATION DES ANTIMICROBIENS?

Les antimicrobiens sont des médicaments qui permettent de sauver des vies, et ils ont révolutionné la prise en charge des infections depuis l'utilisation clinique de la pénicilline dans les années 1940. Aujourd'hui, les antimicrobiens sont souvent prescrits et on estime que de 30 à 60 % des patients hospitalisés reçoivent au moins une dose d'antimicrobien. Chez les patients des unités des soins intensifs, ce pourcentage se rapproche davantage de 70 %²⁻⁵. Des études rétrospectives ont montré de façon régulière que jusqu'à 50 % des prescriptions d'antibiotiques pouvaient être sous-optimales⁶⁻⁸. La prescription inutile ou inappropriée d'un antimicrobien peut compromettre les résultats thérapeutiques, exposer un patient à des effets indésirables et à des interactions médicamenteuses, créer un environnement favorisant l'induction et l'émergence d'organismes résistants et entraîner une augmentation significative des coûts.

Malheureusement, l'utilité de notre arsenal antibiotique est constamment menacée par l'augmentation de la résistance aux antibiotiques, un problème à l'échelle mondiale. De plus, il est peu probable que de nouveaux agents antimicrobiens efficaces contre de nombreux organismes résistants préoccupants soient disponibles dans un avenir rapproché⁹. En réalisant une extrapolation à partir des données américaines, on estime que 220 000 patients développent chaque année une infection nosocomiale au Canada¹⁰. Or, les infections nosocomiales sont de plus en plus causées par des organismes résistants. Les patients atteints d'infections graves liées à des bactéries résistantes à plusieurs médicaments ont un séjour plus long à l'hôpital, affichent un taux de mortalité plus élevé et leurs soins entraînent des coûts de traitement nettement plus élevés comparativement aux patients atteints d'infections liées à des bactéries plus sensibles¹¹. Par exemple, les patients atteints d'une infection du sang (bactériémie) causée par une bactérie gram négatif résistante et productrice de bêta-lactamase à spectre étendu (BLSE) ont un taux de mortalité supérieur (35 % par rapport à 16 %) et un séjour plus long après la bactériémie (11 jours par rapport à 5 jours) comparativement aux patients atteints d'une bactériémie causée par une bactérie ne produisant pas de BLSE. Le coût additionnel par patient estimé dans cette étude était de 9 620 \$ US¹².

La prévention des infections et les mesures de contrôle, avec la gestion de l'utilisation des antimicrobiens, sont les deux principales stratégies pour limiter la résistance aux antimicrobiens⁹.

QU'EST-CE QUE LA GESTION DE L'UTILISATION DES ANTIMICROBIENS?

La « gestion de l'utilisation » correspond à « la gestion prudente et responsable d'un bien qui aurait été confié par une personne »¹³. De fait, la gestion de l'utilisation des antimicrobiens a été définie de plusieurs façons; toutefois, le message clé est toujours le même : il s'agit d'un effort coordonné en vue d'assurer l'utilisation judicieuse et efficace des antimicrobiens. Idéalement, une telle gestion nécessite l'évaluation continue du besoin à l'égard d'un traitement antimicrobien ainsi que du choix, de la dose, de la voie d'administration et de la durée d'un tel traitement. Les principaux objectifs de la gestion de l'utilisation des antimicrobiens consistent à optimiser les

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résultats thérapeutiques tout en réduisant au minimum les conséquences involontaires du recours aux antimicrobiens, telles que la toxicité, les surinfections (p. ex., infection à *C. difficile*) et l'émergence d'organismes résistants^{6,8}. La réduction des coûts associés aux soins de santé sans entraîner de diminution de la qualité des soins représente un objectif secondaire de la gestion de l'utilisation des antimicrobiens⁶.

Le concept de gestion de l'utilisation des antimicrobiens n'est pas nouveau; cependant, cette activité est de plus en plus reconnue comme étant une composante importante des soins prodigués aux patients, particulièrement au sein des établissements de santé. Plusieurs associations et organismes font la promotion de programmes officiels de gestion de l'utilisation des antimicrobiens afin d'encourager le recours judicieux aux antimicrobiens, d'améliorer les soins aux patients et de contenir l'apparition de résistances aux antibiotiques. Ces associations et organismes comprennent : 1) Santé publique Ontario et l'Association des hôpitaux de l'Ontario¹⁴; 2) Agrément Canada (un programme de gestion de l'utilisation des antimicrobiens est maintenant une pratique organisationnelle requise pour les établissements de soins aigus)¹⁵; 3) aux États-Unis, l'Infectious Disease Society of America (IDSA), la Society of Healthcare Epidemiology of America (SHEA) et le Center for Disease Control (CDC)^{6,8}; 4) l'Organisation mondiale de la Santé (OMS)¹⁶ et 5) divers organismes gouvernementaux nationaux.

En 2007, l'IDSA et la SHEA ont publié des lignes directrices pour l'élaboration de programmes de gestion de l'utilisation des antimicrobiens dans les établissements de santé, lesquelles lignes directrices reconnaissent que les activités des programmes de gestion de l'utilisation des antimicrobiens permettent d'améliorer les résultats observés chez les patients et aident à limiter la résistance aux antibiotiques⁶.

PROGRAMMES DE GESTION DE L'UTILISATION DES ANTIMICROBIENS

Les programmes de gestion de l'utilisation des antimicrobiens sont des efforts formels, coordonnés et multidisciplinaires qui visent à surveiller, à gérer et à optimiser le recours aux antimicrobiens, et leur objectif ultime est d'améliorer les résultats thérapeutiques. L'équipe principale d'un tel programme est habituellement composée d'un infectiologue et de pharmaciens, dont le rôle principal consiste à travailler avec les équipes cliniques afin de fournir de l'éducation et des directives en vue d'optimiser le traitement antimicrobien pour chaque patient. Les praticiens responsables de la prévention des infections ainsi que la Division de microbiologie, l'administration de l'hôpital et le Service de la technologie de l'information jouent aussi un rôle essentiel au sein des programmes de gestion de l'utilisation des antimicrobiens⁶.

Les stratégies actives de gestion de l'utilisation des antimicrobiens, principalement l'examen du dossier des patients (durant la phase active du traitement) avec une rétroaction au médecin prescripteur et la restriction antimicrobienne avec préautorisation, se sont avérées les plus positives en ce qui a trait à l'amélioration du recours aux antimicrobiens⁶. De telles activités peuvent être complétées par de l'éducation, l'élaboration de lignes directrices et de marches à suivre, la mise en place de programmes de conversion de médicaments intraveineux à des médicaments oraux ainsi que la surveillance de la résistance et le signalement de cas de sensibilité sélective par le laboratoire de microbiologie.

Bien que le centre d'intérêt des premiers rapports sur les activités de gestion de l'utilisation des antimicrobiens ait été l'économie de coûts, les documents plus récents portant sur les programmes de gestion de l'utilisation des antimicrobiens ont examiné différents paramètres, incluant la pertinence de prescrire des antimicrobiens, les dépenses, la résistance aux antibiotiques et les résultats cliniques. La plupart de ces études ont fait état de bienfaits économiques; certaines ont souligné des améliorations en termes de résistance et de résultats thérapeutiques, comme une diminution des cas d'infections à *C. difficile*. Des différences considérables ont été observées entre ces études en ce qui a trait au type d'établissement ou de population de patients, au type d'activité et aux résultats^{17,18}.

Des rapports plus récents portent notamment sur la mise en œuvre d'un programme de gestion de l'utilisation des antimicrobiens avec examen des dossiers de patients durant la phase active de traitement et rétroaction dans une Unité des soins intensifs de 12 lits d'un hôpital communautaire de Toronto. Le programme a entraîné une diminution nette du recours aux antibiotiques anti-pseudomoniques (39 %), des coûts (diminution de 36 % par jour-patient) et des taux d'infections nosocomiales à *C. difficile*, comparativement à la même période de l'année précédant la mise en œuvre du programme de gestion de l'utilisation des antimicrobiens. La gravité de la maladie et le taux de mortalité à l'Unité des soins intensifs étaient similaires avant et après la mise en œuvre du programme¹⁹. Dans un autre essai visant à examiner l'effet d'un programme de gestion de l'utilisation des antimicrobiens au sein d'un Département de médecine interne, des équipes ont été réparties de façon aléatoire à l'une des deux stratégies suivantes : intervention en fonction d'un programme de gestion de l'utilisation des antimicrobiens ou intervention selon la disponibilité standard de lignes directrices pour la prescription. Des patients ayant reçu une prescription pour un des trois antibactériens sélectionnés (c.-à-d., pipéracilline-tazobactam, vancomycine ou lévofloxacine) ont été évalués. Une proportion nettement supérieure de prescriptions ont été jugées

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Example 2: The Ottawa Hospital - “Antimicrobial Stewardship: Preserving Our Antibiotic Resources at The Ottawa Hospital”. Info Pharm; January-March 2012 (continued)

appropriées dans le groupe soumis au programme de gestion de l'utilisation des antimicrobiens comparativement au groupe témoin (lignes directrices seulement), avec une durée médiane connexe inférieure de recours inapproprié à un antibiotique (2 jours par rapport à 5 jours, $p < 0,001$). Comparativement aux patients du groupe témoin, les patients du groupe soumis au programme étaient associés à un taux de mortalité similaire mais aussi à une durée médiane de séjour nettement plus courte³⁰.

PROGRAMME DE GESTION DE L'UTILISATION DES ANTIMICROBIENS À L'HO

Bien que les efforts et les travaux actuels réalisés à L'Hôpital d'Ottawa (L'HO) encouragent le recours approprié aux antibiotiques, la mise en place d'un programme dédié de gestion de l'utilisation des antimicrobiens a été recommandée par le Sous-comité sur les antimicrobiens du Comité de pharmacologie et de thérapeutique afin d'améliorer la situation davantage. Un programme officiel de gestion de l'utilisation des antimicrobiens a récemment été approuvé par la haute direction et a été mis sur pied à l'automne 2011. L'équipe du programme de gestion de l'utilisation des antimicrobiens de L'HO est constituée de deux pharmaciens à temps partiel qui bénéficient du soutien d'un infectiologue.

La vision, la mission et les objectifs du nouveau programme sont présentés à la Figure 1. Une approche fondée sur les unités de soins, utilisant l'Unité de médecine générale du Campus Général et l'Unité des soins intensifs du Campus Civic, a été choisie pour la première phase du programme. L'examen prospectif des dossiers de patients avec une rétroaction en temps réel à l'équipe à l'origine de la prescription, l'une des deux stratégies principales recommandées par les lignes directrices de IDSA/SHEA, a été la stratégie privilégiée. Cette méthode encourage l'évaluation continue du traitement antimicrobien, contrairement à la réalisation d'une évaluation initiale seulement. L'évaluation et les résultats du programme comprendront les coûts et l'usage des antimicrobiens, le taux d'infection à *C. difficile* et le pourcentage de recommandations acceptées. Les résultats préliminaires indiquent que les types de recommandations les plus fréquentes faites à ce jour par le programme de gestion de l'utilisation des antimicrobiens comprennent l'arrêt des antibiotiques (pas ou plus requis, durée de traitement suffisante), la « diminution » du traitement (en choisissant un agent ayant un spectre d'activité plus étroit, souvent à la lumière des résultats de culture) et l'optimisation de la dose ou de la voie d'administration³¹. Jusqu'à maintenant, le programme a été bien reçu, et des plans visant à étendre le programme au sein de l'hôpital sont en cours d'élaboration.

GESTION DE L'UTILISATION DES ANTIMICROBIENS : QUE POUVEZ-VOUS FAIRE?

Pour que la gestion de l'utilisation des antimicrobiens soit efficace, l'ensemble de l'établissement doit s'engager à y prendre part. Tout le personnel de l'hôpital peut participer à la gestion de l'utilisation des antimicrobiens en adoptant la culture et en faisant de l'optimisation du recours aux antimicrobiens une priorité au sein de l'hôpital. D'autres mesures peuvent avoir une incidence sur le recours aux antimicrobiens, notamment : 1) réévaluer et éliminer les cathéters (p. ex., urinaires, intraveineux) qui ne sont plus nécessaires; 2) avoir accès à de l'expertise (p. ex., consulter un infectiologue); 3) prélever des cultures avant d'administrer des antibiotiques; 4) passer régulièrement en revue les besoins continus des patients ayant reçu une prescription pour des antibiotiques, avec des rappels réguliers par les infirmières et les pharmaciens; 5) promouvoir la vaccination; 6) participer à l'élaboration de lignes directrices sur le traitement des infections et suivre ces lignes directrices en fonction des schémas locaux de résistance (consulter l'antibiogramme de L'HO et les lignes directrices de L'HO pour le traitement empirique qui sont disponibles sous « Ressources » dans vOacis); et 7) documenter la justification et le plan du traitement antimicrobien dans le dossier du patient^{8,22}. (Un revue récente a indiqué que la documentation associée aux patients recevant une prescription pour une antibiothérapie à L'HO était sous-optimale)²³.

CONCLUSION

La résistance aux antibiotiques, conjuguée à une réduction de la gamme de nouveaux agents antimicrobiens, représente une préoccupation locale et mondiale. Les programmes de gestion de l'utilisation des antibiotiques sont de plus en plus encouragés partout dans le monde en tant que façon de promouvoir l'utilisation judicieuse des antimicrobiens, d'améliorer la sécurité des patients et de contenir l'apparition de résistance aux antibiotiques. Bien qu'elle date de plus de 35 ans, la citation qui apparaît au début de ce document est encore plus pertinente aujourd'hui. La gestion de l'utilisation des antimicrobiens est un élément central en vue de préserver l'utilité future des agents antimicrobiens.

Figure 1 : Programme de gestion de l'utilisation des antimicrobiens de L'HO : vision, mission et objectifs

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Example 2: The Ottawa Hospital - “Antimicrobial Stewardship: Preserving Our Antibiotic Resources at The Ottawa Hospital”. Info Pharm; January-March 2012 (continued)

Vision :

Être reconnu comme un chef de file en atteignant et en favorisant l'excellence en ce qui a trait au recours aux agents antimicrobiens.

Mission :

- 1) Améliorer les résultats et la sécurité des patients en rehaussant la qualité des prescriptions pour des antimicrobiens.
- 2) Perfectionner les connaissances et les aptitudes des professionnels de la santé en ce qui a trait à la prescription d'antimicrobiens et promouvoir l'importance de la gestion de l'utilisation des antimicrobiens.
- 3) Décélérer les occasions de recherche et évaluer les nouvelles interventions de manière à faire progresser la direction de la gestion de l'utilisation des antimicrobiens.

Objectifs :

- 1) Optimiser les résultats cliniques chez les patients traités avec des agents antimicrobiens.
- 2) Diminuer les effets indésirables liés à l'utilisation d'antimicrobiens.
- 3) Freiner l'augmentation des cas de résistance aux antimicrobiens.
- 4) Permettre une pratique plus rentable en matière de prescription d'antimicrobiens.
- 5) Réaliser des améliorations soutenues sur le plan des pratiques de prescription d'antimicrobiens.
- 6) Évaluer et faire connaître les méthodes visant à améliorer la gestion de l'utilisation des antimicrobiens.

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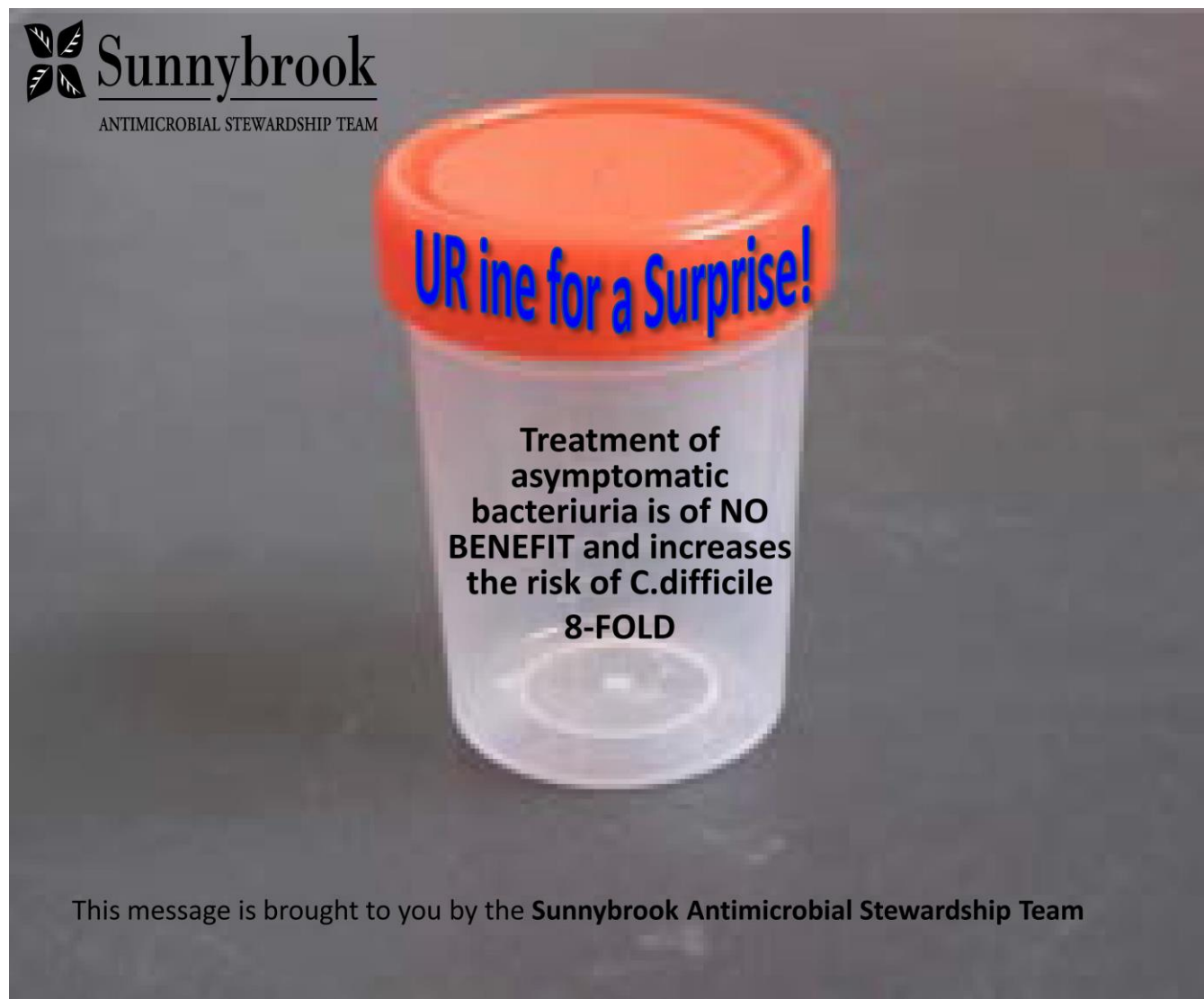
Example 3: Sunnybrook Health Sciences Centre - UR ine for a Surprise! Poster Series



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Example 3: Sunnybrook Health Sciences Centre - UR ine for a Surprise! Poster Series (continued)



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Example 4: Halton Healthcare - New Pharmacist Orientation Guide at HHS. Organizational Pharmacy Core Competencies: Antimicrobial Stewardship



New Pharmacist Orientation Guide at HHS

Organizational Pharmacy Core Competencies Antimicrobial Stewardship

ANTIMICROBIAL STEWARDSHIP			Assessment	
Assessment levels:			Self-assessment	Preceptor/delegate assessment
P = Pass F = Fair S = Satisfactory G = Good E = Excellent			Date	Initials/ Date
Competency	Resources	Evaluation		
Understand the role of the Infectious Diseases (ID) pharmacist and ID physician for Antimicrobial Stewardship	<ul style="list-style-type: none"> - ID Pharmacist - ID Physician - HHS Antimicrobial Stewardship Policy and Procedure - ID Pharmacist's job description 	<ul style="list-style-type: none"> - Preparation of list of patient summaries for further review by the ID physician - Preparation of list of anti-infective agents due to expire by automatic stop order - Meet with unit pharmacist (daily Pharmacy Stewardship Rounds) - Attend Stewardship Rounds with ID physician for both ICU and non-ICU areas 		
Understand the role a staff pharmacist plays in the stewardship program	<ul style="list-style-type: none"> - ASHP, CSHP - Staff Pharmacist's job description (Also see competencies on timing, choice of therapy, dosing, route, duration etc. listed below) 	<ul style="list-style-type: none"> - Describe how to initiate review of a patient by the Antimicrobial Stewardship Program (ASP) - Documentation of interventions using SBAR format - Understand how to contact a physician - Make a verbal recommendation to a physician - Make a written recommendation to a physician in multidisciplinary section of the chart - Write a telephone order - Write a medication change as per HHS medication policy (e.g. Therapeutic Interchange, Automatic Stop Order, Drug Order Clarification) 		

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Example 4: Halton Healthcare - New Pharmacist Orientation Guide at HHS.

Organizational Pharmacy Core Competencies: Antimicrobial Stewardship (continued)

New Pharmacist Orientation Guide at HHS			Assessment	
ANTIMICROBIAL STEWARDSHIP			Self-assessment	Preceptor/delegate assessment
Assessment levels:			Date	Initials/Date
P = Pass F = Fair S = Satisfactory G = Good E = Excellent				
Competency	Resources	Evaluation		
Understand how optimal timing of antimicrobial therapy is achieved	- Medication Administration Times Policy - Drug Order Clarification and Therapeutic Interventions Policy	- Demonstrate how to modify a patient's medication schedule to avoid drug-drug interactions (e.g. calcium and levofloxacin), by documenting a medication order change		
Understand how pharmacists can influence the choice of antimicrobial therapy	- Sanford Guide - Anti-Infective Formulary - Therapeutic Interchange Policy and list - Reserved Drug Policy and list	- Review drug interaction between rifampin and anticoagulant medications - Review treatment options for a patient requiring treatment of community acquired pneumonia (CAP) who is taking medications that prolong the QT interval		
Understand how pharmacists can optimize the dosing of antimicrobials	- UHN Guidelines for Anti-Infective Use - Therapeutic Interchange Policy - Drug Order Clarification and Therapeutic Interventions Policy - Dosing Guidelines in Renal Impairment (Awaiting placement on Connections, Pharmacy Team Site)	- Describe how to monitor a patient receiving treatment with vancomycin and/or aminoglycoside - Demonstrate how to adjust the dose of an antimicrobial agent for a patient with renal insufficiency		
Understand how pharmacists can optimize the route of administration of antimicrobial therapy	- Antimicrobial Stewardship Guideline for Pharmacists: IV to PO (Connections, Pharmacy Team Site)	- Provide examples of highly bioavailable antimicrobial agents - Demonstrate how to recommend appropriate IV to PO stepdown		

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Example 4: Halton Healthcare - New Pharmacist Orientation Guide at HHS. Organizational Pharmacy Core Competencies: Antimicrobial Stewardship (continued)

New Pharmacist Orientation Guide at HHS				
ANTIMICROBIAL STEWARDSHIP			Assessment	
Assessment levels:			Self-assessment	Preceptor/delegate assessment
P = Pass F = Fair S = Satisfactory G = Good E = Excellent			Date	Initials/ Date
Competency	Resources	Evaluation		
Understand how pharmacists can optimize the duration of antimicrobial therapy	- Automatic Stop Order Policy	- Review and assess an antimicrobial agent appearing on the expired drug list		
Understand how pharmacists can contribute to management of <i>Clostridium difficile</i> infection (CDI)	- Clostridium difficile Diagnosis and Management Algorithm - Vancomycin Enema for CDI Order Set and Administration Instructions (via HOPP) - Antimicrobial Stewardship Guideline for Pharmacists – CDI (Connections, Pharmacy Team Site) - Oral Vancomycin for Emergency Discharge Use (Connections, Pharmacy Team Site)	- Perform a medication review for a patient newly diagnosed with CDI		
Understand the process for obtaining a Special Access anti-infective agent (e.g. artesunate, quinine injectable, rifampin injectable, isoniazid injectable, ivermectin tablets)	- Special Access Medications Policy - Special Access Forms (See links on S: drive) - Formulary Comments screen in MediTech for IV artesunate and IV quinine	- Describe the process for obtaining IV antimalarial agents on an urgent basis via the Canadian Malaria Network - Describe the process for obtaining a Special Access medication, e.g. IV rifampin, on an urgent (same day) basis		

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Example 4: Halton Healthcare - New Pharmacist Orientation Guide at HHS. Organizational Pharmacy Core Competencies: Antimicrobial Stewardship (continued)

New Pharmacist Orientation Guide at HHS				
ANTIMICROBIAL STEWARDSHIP			Assessment	
Assessment levels:			Self-assessment	Preceptor/delegate assessment
P = Pass F = Fair S = Satisfactory G = Good E = Excellent			Date	Initials/ Date
Competency	Resources	Evaluation		
Understand the place of desensitization to antimicrobials in patients with suspected or known allergies	<ul style="list-style-type: none"> - Desensitization Protocol for Penicillin G (See IV guideline for Penicillin G) - Antimicrobial Stewardship Guideline for Pharmacists: Penicillin Desensitization - Desensitization Protocol for Ampicillin (draft) - Desensitization Protocol for Ceftriaxone (draft) 	<ul style="list-style-type: none"> - Describe the rationale for the process of drug desensitization - Describe the responsibilities of a physician wishing to prescribe a desensitization protocol 		
Understand the application of Penicillin G benzathine (long-acting Penicillin G injectable form) in the treatment of syphilis infection	<ul style="list-style-type: none"> - Penicillin G Benzathine – Use and Procurement (Connections, Pharmacy Team Site) 	<ul style="list-style-type: none"> - Describe the logistics for providing treatment with Penicillin G benzathine 		
Understand protocols for prevention of HIV -post-exposure prophylaxis (PEP) -prevention of intrapartum mother to child transmission of HIV	<ul style="list-style-type: none"> - Accidental Exposure to Blood-Borne Pathogens (HBV, HCV and HIV) – note: this policy is in draft and not yet published - Order sets for prevention of mother to child transmission of HIV (via HOPP) 	<ul style="list-style-type: none"> - Describe where to find the resources relating to the prevention of HIV - Describe where to locate kits for prevention of HIV 		
Understand how vaccines are stored and distributed at HHS	<ul style="list-style-type: none"> - HHS Formulary (sections 80:08 and 80:12) - Vaccine Storage and Handling Policy - Medical Directive: Administration of Influenza Vaccine - Splenectomy Order Set 	<ul style="list-style-type: none"> - Describe where the pharmacy inventory of vaccines are stored - Describe the process of obtaining vaccines (Public Health) - Describe the process for supplying a vaccine for use in a patient care area 		

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Example 4: Halton Healthcare - New Pharmacist Orientation Guide at HHS. Organizational Pharmacy Core Competencies: Antimicrobial Stewardship (continued)

New Pharmacist Orientation Guide at HHS				
ANTIMICROBIAL STEWARDSHIP			Assessment	
Assessment levels:			Self-assessment	Preceptor/delegate assessment
P = Pass F = Fair S = Satisfactory G = Good E = Excellent			Date	Initials/ Date
Competency	Resources	Evaluation		
Understand the role of the Microbiology Laboratory in contributing to Antimicrobial Stewardship (including HHS antibiogram)	- Microbiology Lab Personnels - HHS Antibiogram (EPPIC)	- Receive an orientation tour to the Microbiology Lab - Demonstrate adequate interpretation of microbiology results in EMR while working up a patient case		
Receive an orientation to Pandemic Planning	- Director of Pharmacy	- Be aware that corporate and departmental pandemic plans exist - Explain how a pharmacist's responsibilities might be affected during a pandemic situation		
Understand the relevance of performance indicators and measurables in monitoring the effectiveness of Antimicrobial Stewardship	- Infectious Diseases Pharmacist - Minutes of Antimicrobial Stewardship Committee meetings (see also Pharmacy and Therapeutics Committee meeting Minutes) - Antimicrobial Stewardship Accreditation 2013 Binder	- Describe how the effectiveness of the ASP is measured (DDD per 1000 patient days, IV to PO data, intervention data, expiring medications data)		
Understand the place of the Antimicrobial Stewardship Committee at HHS	- Antimicrobial Stewardship Committee Terms of Reference - Antimicrobial Stewardship Committee meeting Minutes - Antimicrobial Stewardship Accreditation 2013 Binder	- Describe three of the goals of the Antimicrobial Stewardship Committee - List the departments that are represented on the Antimicrobial Stewardship Committee		

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