NEW CDSS APP!

Antimicrobial CDSS Online

CDSS

Antimicrobial Computer Decision Support System

Frequently Asked Questions

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What is the Antimicrobial CDSS?

A tool within the Computerized Patient Record System (CPRS) that offers antimicrobial prescribing advice at the point of order entry. The system is structured as an order menu decision tree that contains quick orders pre-programmed with appropriate antimicrobial regimens for specific infectious diseases and syndromes.

The Antimicrobial CDSS is also available online and as a mobile app, known as Antimicrobial CDSS Online. The content of this version mirrors CPRS's version but does not contain antimicrobial quick orders and is for reference only.

What are the Goals of the Antimicrobial CDSS?

Improve patient outcomes, reduce rates of microbial resistance, prevent adverse patient outcomes, optimize costs and improve providers' lives. In addition to these goals, the program fulfills antimicrobial stewardship quality standards implemented by the Joint Commission.

Why Should I use the Antimicrobial CDSS?

Improve patient outcomes

In a 2013 study, Minneapolis Veterans Affairs Medical Center (MVAMC) antimicrobial courses ordered through the Antimicrobial CDSS within CPRS were significantly more likely to be appropriate from start to completion, (44%) compared to non-CDSS courses (33%, P = 0.013)[1]. This is consistent with other studies that have shown significant improvement in appropriate use of antimicrobials when CDSS programs are utilized[2].

Order restricted antimicrobials (Minneapolis VAHCS only)

The Minneapolis VAHCS has a restricted antimicrobial formulary. A restricted formulary reduces the cost of health care and is an integral part of antimicrobial stewardship[3]. The Antimicrobial CDSS within CPRS provides a method of formulary restriction that doesn't require a call back from pharmacy or a prior authorization for the antimicrobial to be approved. Restricted antimicrobials ordered outside the Antimicrobial CDSS within CPRS require ID approval.

Increased efficiency

Along with being able to order restricted antimicrobials without a prior authorization, the Antimicrobial CDSS within CPRS provides quick orders pre-programmed with appropriate antimicrobial regimens for specific infectious diseases. Using the system saves time and increases the efficiency of the ordering provider.

How do I Access the Antimicrobial CDSS?

The Antimicrobial CDSS has been designed to offer antimicrobial prescribing advice quickly and efficiently. Since inpatient, outpatient and emergency department medications are ordered differently, the Antimicrobial CDSS has separate CPRS versions for ordering in these locations.

The Antimicrobial CDSS Online version mirrors CPRS content with minor differences and is for reference only as it contains no antimicrobial quick orders. At the Minneapolis VAHCS, restricted antimicrobials must be ordered through the Antimicrobial CDSS in CPRS.

Accessing within CPRS

To access the Antimicrobial CDSS in CPRS, open CPRS and click on the "Orders" tab at the bottom left-hand side of the CPRS window.
*Note: The below directions are specific for the Minneapolis Veterans Affairs Health Care System (VHACS) only. Access at other VAHCSs will vary.
For inpatients:
On the left-hand side of the "Orders" tab, click on the "Medicine Inpt Orders…" option (Figure 1) In the right-hand column of the window that pops up, under the "INFECTIONS" header, select "#341 Antimicrobials (CDSS)…". The main menu of the Inpatient Antimicrobial CDSS will now be open.
For outpatients:
On the left-hand side of the "Orders" tab, click on the "Medicine Outpt Orders…" option (Figure 1).   In the right-hand column of the window that pops up, select "#55 Antimicrobial (CDSS)… ". The main menu of the Outpatient Antimicrobial CDSS will now be open.
For emergency department patients:
On the left-hand side of the "Orders" tab, click on the "Emergency Department Orders…" option (Figure 1).   In the right-hand column of the window that pops up, select "#62 ED Antimicrobial CDSS… ". The main menu of the Outpatient Antimicrobial CDSS will now be open.

Accessing from web or mobile device (Orders must be placed in CDSS in CPRS)

To access the Antimicrobial CDSS from the web, on any device or network, open this link: Antimicrobial CDSS Online <OR> use the link that is available in the main menu of the Antimicrobial CDSS in CPRS <OR> use the link in the "Tools" menu of CPRS under "More" option.

Installing and updating app (Orders must be placed in CDSS in CPRS)

Use the link above to navigate to the Antimicrobial CDSS Online. You will be able to install or update the app on your device using the directions below based on type of device.

PC and Android Devices:
Once the App is ready to install or update on your PC or Android device, a button with the text "Install/Update App" will appear at the bottom of the Antimicrobial CDSS Online home screen or at the top right of the window when version is selected (Figure 2). Press the button to and follow the prompts to complete the installation or update.

If the "Install/Update App" button is not visible, wait a few minutes for the button to appear. If the button does not appear, you already have the current ve rsion of the app installed on your device.

Apple Devices:
Select the "Share" button, located at the top or bottom of the browser (appears as a square with an arrow pointing up). Once the App is ready to install or update, the "Add to Home Screen" option will appear (Figure 3). Select this option and follow the prompts to complete the installation or update.
If the "Add to Home Screen" option is not visible, wait a few minutes for the option to appear. If the option does not appear, you already have the current version of the app installed on your device.

What if I Can't Find the Infectious Disease I am Looking For?

Although the Antimicrobial CDSS contains recommendations for the majority of infectious diseases, it does not include them all. If you cannot find the infectious disease in the decision tree, within the index or using the search function (Antimicrobial CDSS Online version only), search for a broader term or synonym (e.g. instead of "chicken pox" search for "varicella"). If you still cannot find the infectious disease you are looking for, contact the Antimicrobial Stewardship Team (Muthu Narayan, DO or Eric Geurkink, PharmD) for help.

Navigate using the decision tree (all versions)

The main menu of the Antimicrobial CDSS contains links to categories of infectious diseases based on syndrome/organ system (e.g. cardiovascular, genitourinary, etc.), organisms (e.g. gram-positive bacteria, gram-negative bacteria, viruses, etc.) and other special cases (Figure 4). To navigate to specific infectious disease, select the category the infectious disease is associated with. Within the category menu, select the specific infectious disease sub-menu for recommendations, quick orders and pertinent resources (e.g., section-specific consults, important drug properties, CDSS system help resources, etc.) (Figure 5).

Navigate using the Index

The index is in the main menu at the top of the left-hand column under the header "Index of Antimicrobial CDSS content" and is also located at the top next to the home button in the online version. The index contains an alphabetized list of Antimicrobial CDSS content. Find the infectious disease, organism or other topic you are looking for by scrolling down the list. When you locate the term you are looking for, click on it to be linked to the menu containing specific recommendations, quick orders and pertinent resources (Figure 6).

Search for the term (web and mobile versions)

The search field is located at the top left of the online version. In the search field, type the term (i.e. pertussis) you are looking for. A list of all recommendations that contain the search term will be displayed, sorted by number of matches (Figure 7).

What if a Desired Antimicrobial is not Provided in the Recommendations?

The Antimicrobial CDSS has been developed locally with input from a broad, representative group of clinicians. All antimicrobial recommendations within the Antimicrobial CDSS are reviewed by a clinical pharmacist and an Infectious Diseases Specialist. Recommendations are based on local susceptibility patterns, clinical evidence, local preferences, and national guidelines. In rare cases, the recommended antimicrobials and listed alternatives may not be preferred for the patient you are treating (e.g. isolate resistance, allergy, etc.). In these cases, a broader set of alternative antimicrobials may be ordered through the Antimicrobial CDSS in CPRS. Like other antimicrobial orders in the CDSS, antimicrobials ordered through the Alternative Antimicrobials menu do not require a prior authorization or ID approval.

To access the Alternative Antimicrobials menu, within the CPRS version of the CDSS, navigate to the menu containing antimicrobial recommendations for the infectious disease you are treating. At the very top of the menu, select option #2 "Select here for help, legend, consults, alternative antimicrobials and more". In the next menu, select option #8 "Alternative Antimicrobials to CDSS Recommendations." Select the reason an alternative antimicrobial is required, then the Alternative Antimicrobials menu will pop up (Figure 8).

The Alternative Antimicrobial menu contains antimicrobial regimens that have been deemed appropriate for use as alternatives to recommended antimicrobials by the Antimicrobial P&T Subcommittee. If the list does not contain the preferred antimicrobial, contact or consult Infectious Diseases or submit a prior authorization request.

The regimens provided in the Alternative Antimicrobial menu are not tailored for a specific infectious disease. The dose, frequency, and duration must be changed based on the infectious disease you are treating as well as for patient specific factors. The usage of alternative antimicrobials is monitored by the Antimicrobial CDSS team for appropriateness and to identify infectious diseases for addition to the system.

What are the Limitations of CDSS Quick Orders in CPRS?

Quick orders are preprogrammed with the typically recommended antimicrobial dose, frequency, and solution for the specific infectious disease. For outpatient prescriptions, when a range is recommended by CDSS, the prescription order will default to the lowest dose and days' supply. For inpatient orders, durations are listed in the recommendations but are not included in the quick order. If desired, the provider must select a duration when completing an inpatient quick order.

Quick orders are not tailored to specific patient factors such as renal insufficiency, comorbidities, contraindications, weight, allergies, etc. The provider must assess every patient closely for these factors and modify recommended antimicrobials if needed. Drug information is available within the Antimicrobial CDSS for reference by the provider (see below "Where Can I Find Drug Information Within the Antimicrobial CDSS?")

Where Can I Find Drug Information Within the Antimicrobial CDSS?

To assist the provider in deciding on therapy, dosing, etc., drug information is provided within specific antimicrobial recommendations and a link to more in-depth information is provided through the General Information menu in the CPRS version of CDSS (Figure 9). Alternatives to preferred antimicrobials are often provided in recommendations. A broader selection of alternative antimicrobials is provided in the Alternative Antimicrobial menu of the Antimicrobial CDSS in CPRS (see above "What if a Preferred Antimicrobial is not Provided in the Recommendations?").

Further Questions and Feedback

You can contact the Antimicrobial CDSS team by phone, Skype or email.

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Figures

Figure 1. Accessing the Antimicrobial CDSS in CPRS within Minneapolis VAHCS
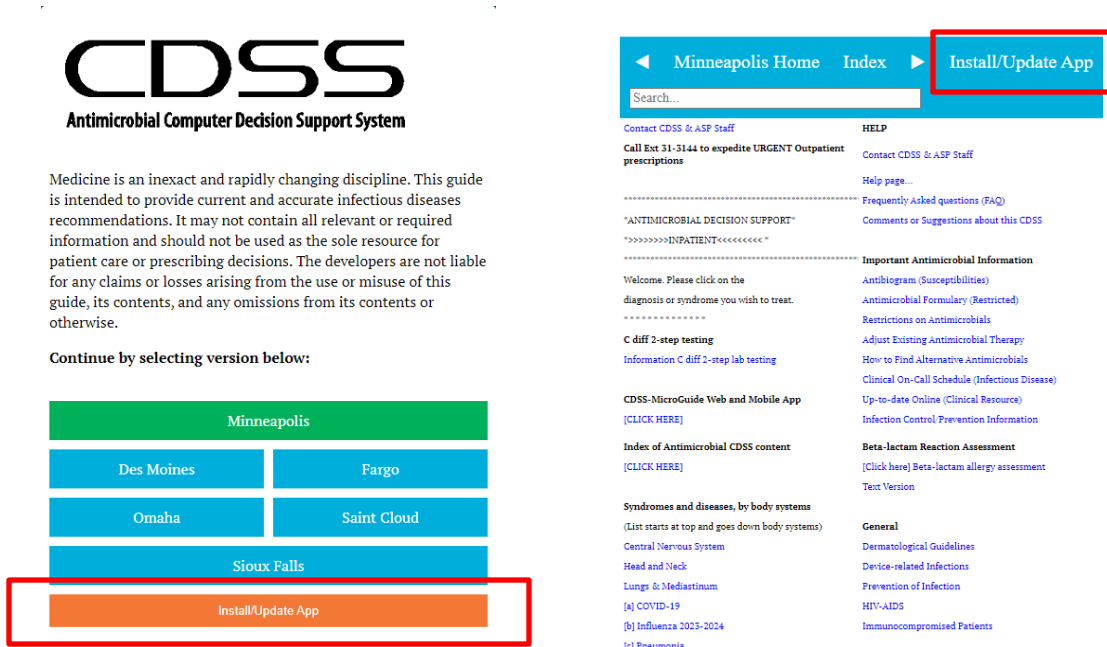
Figure 2. Installing or updating the app on PC and Android devices from the home page or when version is selected.
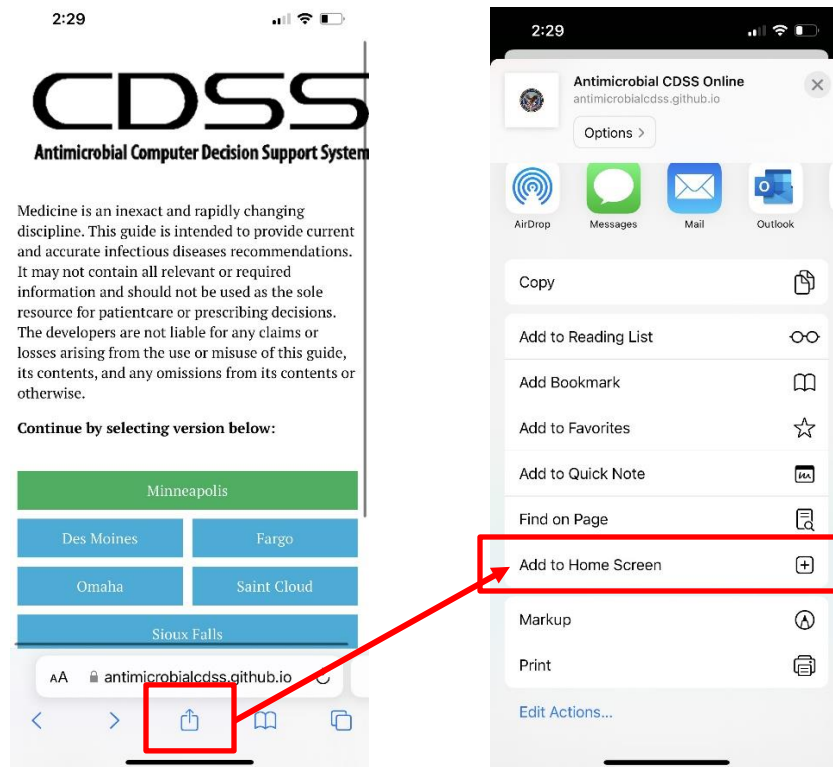
Figure 3. Installing or updating the app on Apple devices
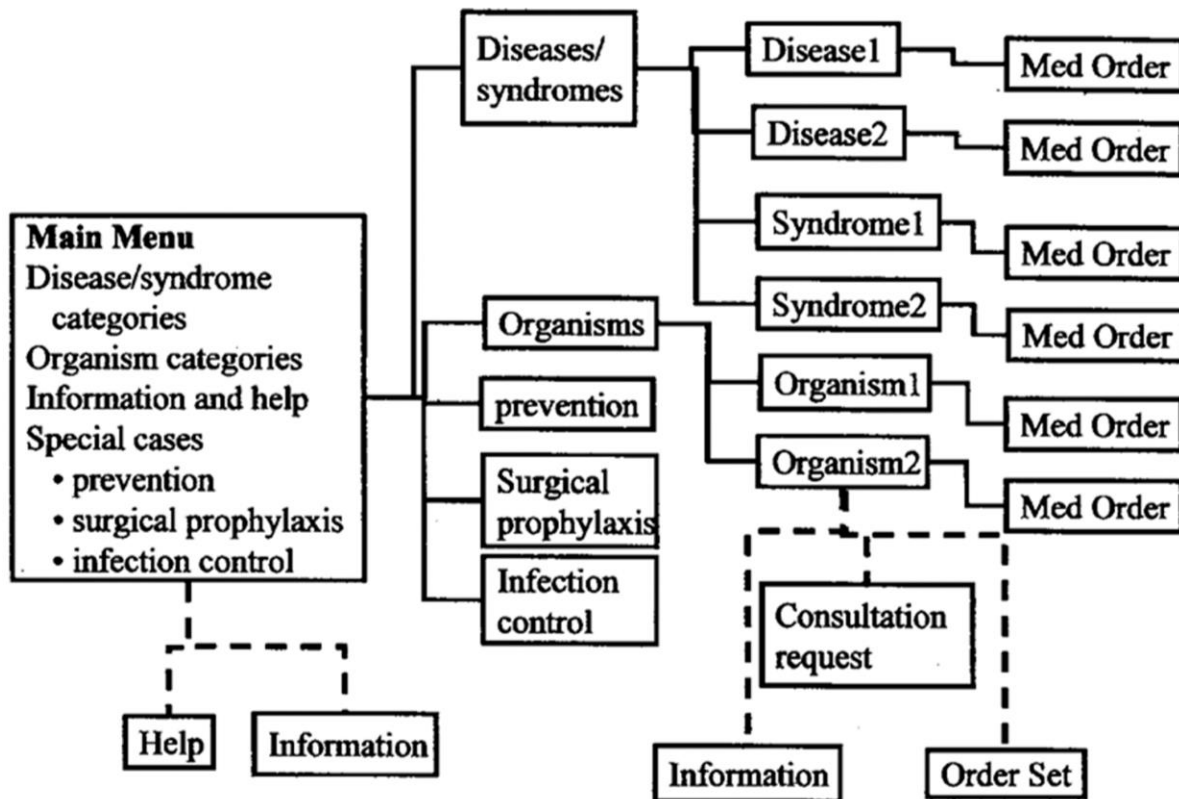
Figure 4. Structure of the Antimicrobial CDSS
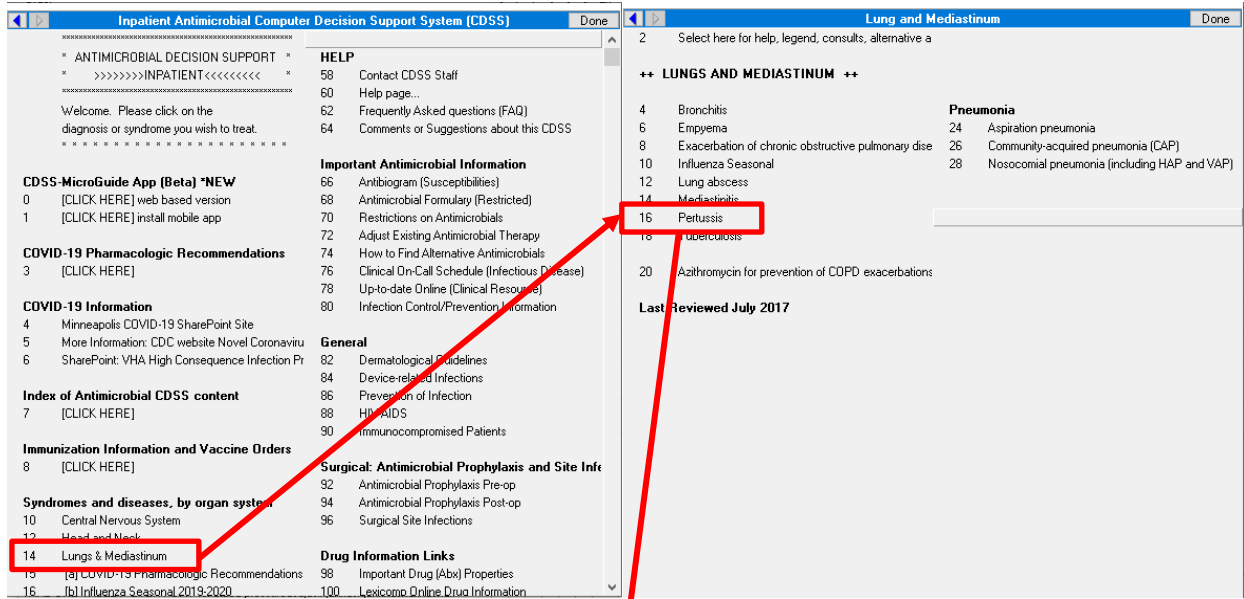
CDSS main menu

Category menu
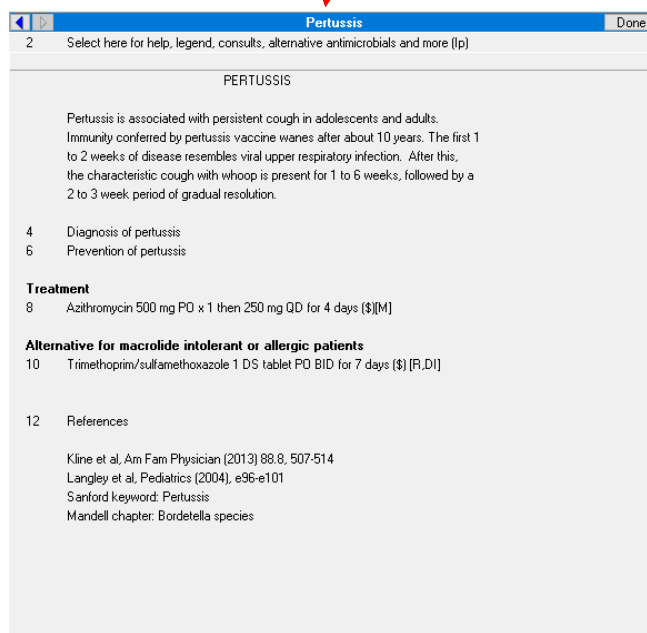
Disease specific menu with recommendations

Figure 5. Navigating using the decision tree
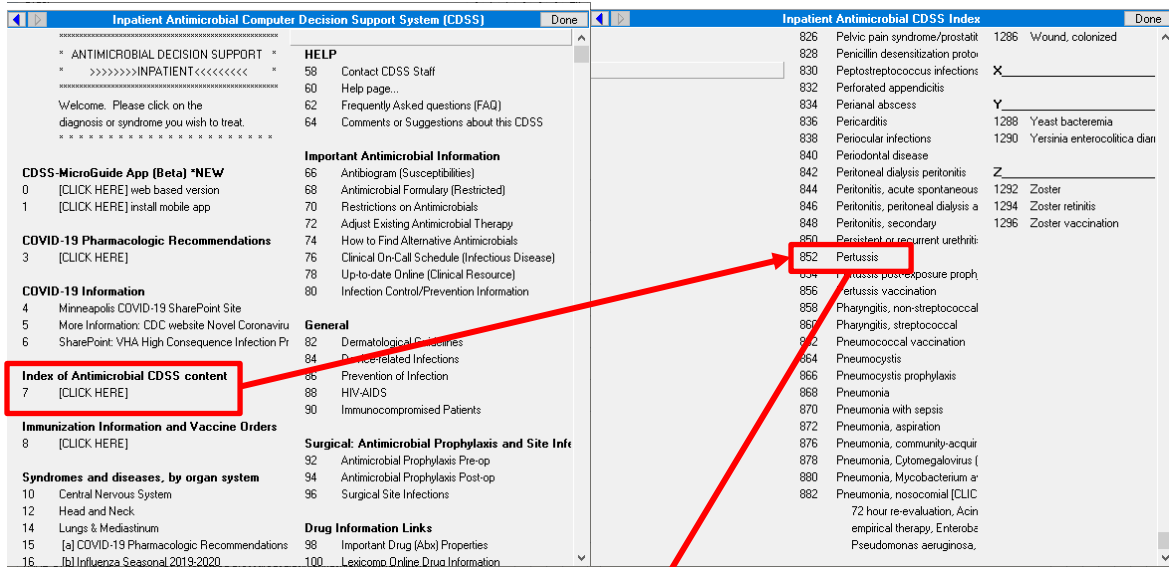
CDSS main menu   **Index menu**
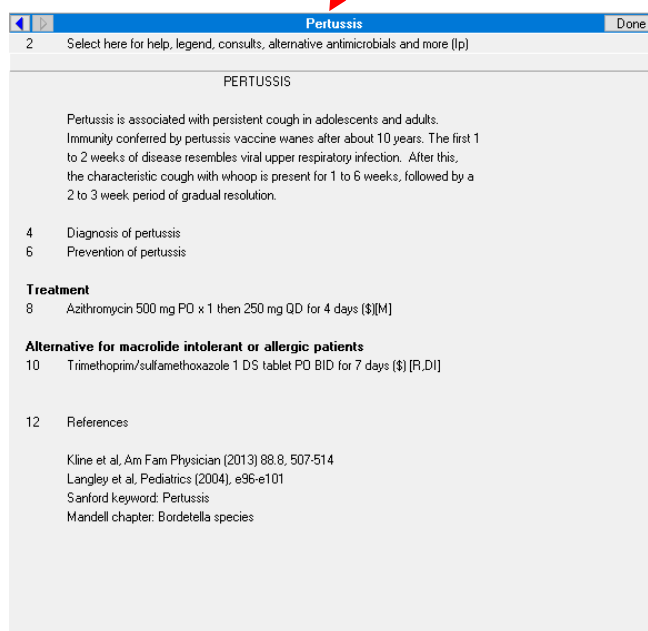
Disease specific menu with recommendations

Figure 6. Navigating using the index

Figure 7. Using Search Function in Web and Mobile App Versions of CDSS

Disease specific menu with recommendations

General Information Menu

Reason for alternative antimicrobial menu

Alternative Antimicrobials menu

Figure 8. Navigating to the Alternative Antimicrobials menu

PERTUSSIS

Pertussis is associated with persistent cough in adolescents and adults. Immunity conferred by pertussis vaccine wanes after about 10 years. The first 1 to 2 weeks of disease resembles viral upper respiratory infection. After this, the characteristic cough with whoop is present for 1 to 6 weeks, followed by a 2 to 3 week period of gradual resolution.

4 Diagnosis of pertussis
6 Prevention of pertussis

Treatment
8 Azithromycin 500 mg PO x 1 then 250 mg QD for 4 days ($)[M]

Alternative for macrolide intolerant or allergic patients
10 Trimethoprim/sulfamethoxazole 1 DS tablet PO BID for 7 days ($) [R,DI]

12 References

Antimicrobial information. Coding is defined within the Legend located in the General Information menu (see below).

Disease specific menu with recommendations

GENERAL INFORMATION

2 Help and Additional Information Menu
3 Infectious Diseases Consult
4 Consult Menu - place consults to specialty service
6 Antibiogram
8 Alternative Antimicrobials to CDSS Recommendations - select here
10 Contact Information
12 Antimicrobial Information

LEGEND
14 Important Drug Properties
[DI] = Important interactions between antimicrobial and other drugs
[H] = Hepatic excretion of antimicrobial
[M] = Minimal risk posed by antimicrobial
[O] = Other important antimicrobial property
[R] = Renal excretion of antimicrobial

16 Antimicrobial Cost Information
($) = <10 dollars per day
($$) = 10-50 dollars per day
($$$) = 51-100 dollars per day
($$$$) = 101-400 dollars per day
($$$$$) = >400 dollars per day

++ IMPORTANT DRUG PROPERTIES PAGE ++
Select below for drug info from online database

4 Acyclovir PO
6 Acyclovir IV
8 Albendazole PO
10 Amantadine PO
12 Amikacin IV
14 Amoxicillin PO
16 Amoxicillin-clavulanate PO
18 Amphotericin B IV
20 Ampicillin IV
22 Ampicillin-sulbactam IV
24 Atovaquone PO
26 Azithromycin PO
28 Azithromycin IV
30 Aztreonam IV
32 Benzathine penicillin IM
34 Caspofungin IV
36 Cefazolin IV
38 Cefepime IV
40 Cefixime PO
42 Cefotetan IV
44 Cefoxitin IV
46 Cefpodoxime PO
48 Ceftazidime IV
50 Ceftriaxone IM
52 Ceftriaxone IV
54 Cefuroxime PO
56 Cephalexin PO
58 Chloramphenicol IV
60 Ciprofloxacin PO
62 Ciprofloxacin IV
64 Clarithromycin PO
66 Clindamycin PO
68 Clindamycin IV
70 Clindamycin Vaginal
72 Clotrimazole Topical

Select antimicrobial to navigate to Sanford Guide website for additional drug information

*Note: Sanford Guide links to specific antimicrobial information is only available in the Minneapolis VAHCS Antimicrobial CDSS

General Information Menu   **Important Drug Properties Menu**

Figure 9. Drug information resources

References

1. Filice et al. *Use of a Computer Decision Support System and Antimicrobial Therapy Appropriateness, infection control and hospital epidemiology.* 2013, 34.6

2. Rawson et al. *A systematic review of clinical decision support systems for antimicrobial management.* Clinical Microbiology and Infection. 2017; 1e9

3. Dellit 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.* Clinical Infectious Diseases 2007; 44:159–77