Tools to Promote Adherence to the Canadian Family Practice Guidelines for the Assessment and Management of Group A Streptococcal Pharyngitis.

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A former family medicine resident physician at Steinbach Family Medical Centre (SFMC), Dr. Aaron Dubyna, authored a chart review study as part of the academic requirements of his residency, titled: Improving Adherence to the Canadian Family Practice (CFP) Guidelines for the Assessment and Management of Group A Pharyngitis.[1] The goals of this study were to attempt to quantify whether physicians in the Steinbach were using Rapid Antigen Detection Testing (RADT) and prescribing antibiotics appropriately with regards to the management of acute pharyngitis.[1] Dr Dubyna modeled his study off of a similar study conducted out of Boston Children's Hospital (Brennan-Krohn et al., 2018) using a retrospective chart analysis to determine how often the use of a clinical rule was documented in pediatric patients complaining of pharyngitis that received either RADT, antibiotics, or both.[1,2] The findings of Dr Dubyna's study will be discussed below, especially his recommendations to create a template within the new EPR system (InputHealth™) being used at SFMC, with the aim of improving adherence to the CFP guidelines. The creation of this template, and associated patient questionnaires, was the focus of my Home for the Summer 2018 project.[1]

Complaints of sore throat are one of the most common reasons that people will go to see a primary care physician, especially in the pediatric population, and especially in the colder months in temperate climates.[3] Some physicians have remarked on the tendency of patients to arrive at the clinic with preconceived notions about the necessity of receiving antibiotics to treat the symptoms of their sore throat.[1] While symptomatic infections of the pharynx caused by Group A β-hemolytic Streptococcus (GABHS) are not uncommon in temperate areas with a distinct winter season, and especially in the population aged 5-15 years, there are some concerns that due diligence is not always followed with respect to determining the cause of acute sore throat, potentially leading to unnecessary prescribing of antibiotics.[1,3] This is because despite the prevalence of GABHS in the population, at least 70% of sore throats in those five to fifteen years of age, and up to 95% of sore throats in adults and those under age five, have viral etiologies.[3] As such, the CFP recommends the use of a clinical decision rule in the management of acute sore throat, based on the CENTOR/McIsaac criteria.[3]

Table 1. CENTOR criteria for assessing suspected Streptococcal pharyngitis.[4]

Presence of cough?	Yes: 0, No: +1
Tender anterior cervical lymphadenopathy?	Yes: +1, No: 0
Fever and/or history of fever?	Yes: +1, No: 0
Tonsillar exudate and/or edema?	Yes: +1, No: 0

The Canadian guidelines differ from the full CENTOR/McIsaac criteria in that they do not make use of the age criteria, but state that the criteria as used "will successfully identify most patients who need treatment for GABHS infection, while decreasing antibiotic use for sore throat by about 80%".[3] Clinicians should assess patients using the above criteria, and score them appropriately. Patients receiving a score of 1 or less are unlikely to be suffering from GABHS: both testing and antibiotics are considered unnecessary, and a recommendation of supportive care including NSAIDs is the best course of action.[1,3] Meanwhile, in those receiving a score of 2 or more, RADT should be used to determine if GABHS infection is likely: a positive test should be followed with prescription of penicillin or amoxicillin (1st generation cephalosporin or macrolide if allergic to penicillin). Despite the relatively low sensitivity (~80%) of the RADT, negative tests should not be followed with empirical antibiotic treatment, and throat cultures should be considered.[3] This is because antibiotics have been shown to reduce symptoms in sore throats by a median of just 16 hours, and most sore throats will have resolved within one week with or without antibiotic treatment.[5] Furthermore, NSAIDS have been shown to be at least as helpful for symptom management in sore throats, while antibiotics are used primarily to reduce the likelihood of post-streptococcal sequelae, such as otitis media, sinusitis, peritonsillar abscess, and rarely, Scarlet fever.[1,7] It is not necessary to start empirical treatment before receiving positive throat cultures to achieve this benefit.[7]

Dr Dubyna's study reviewed the charts of 591 randomly selected patients aged 3-17, who had received a diagnostic code related to sore throat in the past 3 years at SFMC. After exclusion criteria were applied, the cohort was 262 charts reviewed, which was comparable to the benchmark study.[1,2] The study measured three outcomes: first, whether or not the use of the clinical decision rule was documented; second, how often RADT was being performed appropriately; and third, how frequently are the correct antibiotics (type and duration) being prescribed.[1] The goals of this study came from consultation with the physicians practicing at SFMC, who gave a consensus opinion that the decision rule was likely not often being used in clinical practice.[1] As such, the group at SFMC felt that improving adherence to the CFP guidelines regarding the management of sore throats would very likely result in less unnecessary/inappropriate testing and prescribing of antibiotics, thereby constituting a quality improvement at SFMC.[1] The key overall results of Dr. Dubyna's study are listed below in Table 2.

Table 2. Overall results.[1]

Appropriate documentation of clinical rule	49.2% (95% CI 43.0% to 55.5%)
Appropriate use of Rapid Antigen Detection Test	47.1% (95% CI 40.7% to 53.6%)
Appropriate choice and duration of antibiotics*	74.5% (95% CI 66.8% to 81.4%)

*Note above that there was no assessment made of how often antibiotics were being prescribed, as this was deemed to have too many confounding factors; rather, if antibiotics were used, an assessment was made of whether the type and duration of antibiotics used were appropriate.[1] While some weaknesses of the study were identified by the author, such as the subjectivity of the assessment of the various criteria used in the clinical decision rule by different clinicians; overall, it was felt that there was significant room for improvement at SFMC in the adherence to the CFP guidelines, and by extension, improvement in resource and antibiotic stewardship.[1]

The result of this study was that the author, in conjunction with the group at SFMC, made a recommendation to take advantage of certain features in the new electronic patient record (EPR) system being used at SFMC to facilitate the desired improvements identified by the author.[1] The new EPR system (InputHealth™) allows for the use of templates that can be selected, both manually or automatically according to presenting complaints and/or patient input at the time of registration, to improve accurate documentation of patient encounters. These templates also prompt the clinician to remember key elements of the history, exam, assessment and plan for the issue that the template is designed for. It was the intention of Dr Dubyna that someone would create such a template for acute pharyngitis, to encourage clinicians to make use of the CFP decision rule by both gently reminding clinicians of the rule and making it very easy to document its use.[1]

The group at SFMC gave me the task of creating the template recommended by Dr Dubyna, as well as both a pre- and post-visit questionnaires relating to the management of pharyngitis that could be sent to patients via SMS or email: another feature of InputHealth that SFMC wanted to exploit. InputHealth allows for patients to book their own visits online, to see either their own family physician at SFMC or to see the same day care clinic (SDCC). This process is governed by InputHealth, which prompts the patient to select an appropriate length of visit in accordance with what they are selecting as their primary concern. While not many patients are taking advantage of the online registration process currently, the goal of SFMC is that more patients will use this feature in the future as they become more familiar with it. One of the features associated with this process is that automated electronic questionnaires (Qnaires™) can be designed and programmed to be sent to patients that book for certain presenting issues, e.g. sore throat. Patients can choose how they prefer to receive such surveys.

As such, I designed a Qnaire that would be sent to any patient that booked an appointment with a complaint of a sore throat. This Qnaire started with an educational component, informing patients that most sore throats are the result of viral infections,

and therefore will not respond to antibiotic therapy. Patients are then told that some sore throats are caused by GABHS, that antibiotics may be prescribed in these cases, to help avoid certain complications, and that a physician will be able to determine whether this is the case. A short description of key symptoms associated with viral infections (sneeze, conjunctivitis, cough, runny nose) was listed, as well as some hallmarks of GABHS, to help patients to think about the nature of their own sore throat. Finally, a list of "red flag" symptoms was provided, with a prompt to seek urgent medical attention if any red flag symptoms are present. The goal here was not to discourage patients from visiting a clinic, but rather, to provide some basic education and to reinforce the idea that antibiotics are not necessary for all sore throats, and that the physician can help make an accurate assessment of the correct course of action. The Qnaire then proceeds to ask a list of questions, mostly about symptoms, to gather some pre-visit information that may help the attending clinician to make a diagnosis during the patient encounter. The results of this Qnaire are designed to be easily available to the clinician as soon as they open the patient's e-chart.

Next, following the recommendation of Dr Dubyna, I designed a template that could be used during an encounter that is tagged by the clinician as "sore throat", "pharyngitis", or "strep throat". There are two ways this works, either the patient has self-registered online, and received the Qnaire, or else they inform the clinician during the encounter that they are there because of a sore throat. For the former, the template will be automatically populated into the encounter on the patient's chart; for the latter, the clinician simply selects "sore throat", "pharyngitis", or "strep throat" as the presenting complaint/issue, and the system automatically pulls in the appropriate template.

On the template, there are sections for history, exam, assessment and plan, the same as for any encounter on InputHealth. However, the template populates each field with options that are pertinent to the patient with a complaint of sore throat. For example, under history, there are a list of "text bubbles" with the heading: symptoms of viral upper respiratory infections, including sneeze, cough, runny nose, et cetera. These bubbles need only to be selected with a mouse click to populate the data into the note. This not only reminds the clinician to ask about these symptoms to help make an accurate diagnosis, but also facilitates better rapport with the patient during the encounter, as it eliminates the need for focus-intensive typing. Certain bubbles have dual-select options, and these are for the CENTOR criteria employed by the CFP guideline. When the clinician selects these boxes, the option of either: Present, or Absent, is listed, along with the respective score it lends to the decision rule (e.g. +1). Each criteria is clearly identified as such. Under the assessment heading, a reminder of how the criteria works is included, and clinicians must select a bubble pertaining to the score they calculate.

When selected, each bubble has a specific prompt providing instruction as per the guideline: e.g. score 2 or more - use RADT. There is then a bubble for the RADT test which, if selected, allows the user to choose positive or negative result. Each option has a corresponding prompt of how to follow up - either prescribe antibiotics or consider culture.

The whole process allows the clinician to quickly arrive at a diagnosis and to document the use of the clinical decision rule in their rationale of arriving at that diagnosis. Under the plan heading, there is a feature that automatically populates in the patient's known allergies, and has a prompt to ask the patient about penicillin allergy. There is then a list of antibiotic choices, with first-line therapy (penicillin/amoxicillin) being listed as such, or, if penicillin allergy is suspected/known, then a second-line list of appropriate antibiotics appears. Recommended duration of therapy appears when the antibiotic of choice is selected. The goal of this template is not to police clinicians, but rather to serve an easy tool that reminds one how to assess and manage GABHS, improves accountability and documentation, and arms the clinician with the means to show the patient an official process by which the decision to test/not test or prescribe/not prescribe antibiotics was made. This is especially important in light of the frequency with which physicians at SFMC report that patients are demanding antibiotics even where they may not be indicated.[1]

Finally, I was able to design a follow-up Qnaire that would automatically be sent to patients whose charts were coded as "sore throat", "pharyngitis", or "strep throat". This Qnaire did not have an educational component, and was kept as simple and brief as possible, to encourage the greatest proportion of completion among recipients. The post-visit Qnaire was meant for the collection of data surrounding antibiotic usage following an visit to the clinic for a complaint of sore throat. It included questions such as: "did you receive a diagnosis of strep throat?", "did you receive a prescription for antibiotics?", "did you fill that prescription?", "if not, why not", "did you have any side effects from the antibiotics?". Each question was set up so that it would only appear as a follow-up question if the appropriate response was selected in a previous question. In this way, the Qnaire could be designed so that respondents would never be asked questions which did not pertain to their circumstances, which we hoped would improve the flow and pertinence of the Qnaire for the respondent. Importantly, the question "did you receive a prescription for antibiotics?" would not appear if the option "did not receive diagnosis of strep throat" was selected. This was by design, so that respondents would not possibly be given the impression that they should have received antibiotics when they did not have GABHS diagnosis. The Qnaire finishes by asking the respondent how long it took for their symptoms to resolve.

Overall, the paper by Dr Dubyna demonstrated that there was room for improvement with regards to documenting the use of the CFP clinical decision rule in the management of acute pharyngitis. By extension, the assumption was that lack of documentation translated to inappropriate testing and prescribing of antibiotics, which was borne out in the finding of the study by Dr Dubyna. Creating the template and Qnaires that were recommended by Dr Dubyna and others at SFMC, will hopefully facilitate an improvement in both testing and prescribing practices with regards to the management of acute pharyngitis. Furthermore, use of these custom tools will hopefully encourage and empower the clinicians at SFMC to design and use other such tools, which can lead to improvements in other areas of care.

References
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