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SOLICITATION AMENDMENT
MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

Title - Sujet Nursing Agency Services	
Solicitation No. - N° de l'invitation HT426-172611/C	**Amendment No. - N° modif.** 005
Client Reference No. - N° de référence du client HT426-172611	**Date** 2017-12-04
GETS Reference No. - N° de référence de SEAG PW-$$XF-005-31945	
File No. - N° de dossier 005xf.HT426-172611	**CCC No./N° CCC - FMS No./N° VME**
Solicitation Closes - L'invitation prend fin **at - à 02:00 PM** **on - le 2017-12-13**	**Time Zone** **Fuseau horaire** Eastern Standard Time EST
F.O.B. - F.A.B. **Plant-Usine:** ☐ **Destination:** ☐ **Other-Autre:** ☐	
Address Enquiries to: - Adresser toutes questions à: Chapple, Jeremy	**Buyer Id - Id de l'acheteur** 005xf
Telephone No. - N° de téléphone (819) 420-2226 ( )	**FAX No. - N° de FAX** ( ) -
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Canada

NURSING AGENCY SERVICES TO REMOTE, ISOLATED, AND SEMI ISOLATED FIRST NATION (FN) COMMUNITIES ON BEHALF OF HEALTH CANADA (HC)

SOLICITATION NO. HT426-172611/C

AMENDMENT 005

This amendment contains the following sections:

1. Questions and Answers
2. Modifications to the Solicitation

Section 1: Questions and Answers

Note: Questions are numerically sequenced upon arrival at PSPC. A question and its answer will be provided via BuyandSell as the response becomes available. Potential Bidders are therefore advised that questions and answers may be issued via BuyandSell out of sequence. The following questions have been received. In accordance with Article 13 of the 2003 Standard Instructions - Goods or Services - Competitive Requirements (2017-04-27), which has been incorporated into the RFP, the questions and corresponding answers are provided to all potential Bidders as set out below:

Question 10:
In respect of Amendment 002, Question #3, we wish to seek a clarification with the answer that those referred to as 'Personal Support Workers' constitute Healthcare Professionals for the purposes of Attachment 1 to Part 4 (for all Regions).

Section 1.0 of Attachment 1 to Part 4 (for all Regions), defines 'Healthcare Professionals' as "individuals who provide preventative, curative, promotional and/or rehabilitative health care services in a systematic way to individuals, families or communities". This definition applies to the mandatory and point-rated technical evaluation criteria for the RFP.

In the answer to Question #3 in Amendment 002, Canada has indicated that a 'Personal Support Worker' falls within Attachment 1 to Part 4's definition of a 'Healthcare Professional' despite Personal Support Workers not having a national standard, officially recognized designation, licensing standard, or a regulatory body.

We are seeking clarification, as we would assert that a Personal Support Worker is incapable of providing all of the services listed under Part 1, Section 1.2, of the RFP and in the roles set out in the definition of a 'Healthcare Professional'. For instance, a Personal Support Worker cannot diagnosis an illness. Following on the fact that the roles of Personal Support Workers are vastly different than the roles of nurses, nurse practitioners, and doctors, we would assert that the provision and management of personal support workers is vastly different that the provision and management of nurses, nurse practitioners, and doctors. For instance, a nursing home having thirty five full time Personal Support Workers would meet mandatory technical criterion O-MT1 under this RFP.

Our questions are:

A) Is the answer given in Amendment 002 correct or are only the roles stated in the bullet 3 of the A-MT1, M-MT1, O-MT1 and Q-MT1 Bid Preparation Instructions, which state " 3) designation of Healthcare Professional (e.g. Registered Nurse (RN), Nurse Practitioner (NP), Doctor, etc.);" relevant for the

evaluation of mandatory technical criteria A-MT1, M-MT1, O-MT1 and Q-MT1 for the provision of services under this RFP ?

B) If Canada's Answer #3 (published in Amendment 002) is correct, what other health care roles does Health Canada consider as falling within the definition of 'Healthcare Professional', such that the provision and management of these individuals can be listed for evaluation of the mandatory technical criteria A-MT1, M-MT1, O-MT1 and Q-MT1?

For instance, would the following roles be included?

- Midwife [i.e. registration under College of Midwives of Ontario (with exception to Aboriginal midwives); four year university degree; alternative is four-year Aboriginal Midwifery Training Program, etc.]
- Health Care Aide
- Nursing Attendant
- Hospital Orderly
- Health Care Attendant
- Addiction Worker
- Dietary Aide

Answer 10:

A) Canada confirms that Answer #3, published in Amendment 002, is correct; Personal Support Workers will be accepted by Canada as "Healthcare Professionals" for the purposes of demonstrating mandatory technical criteria A-MT1, M-MT1, O-MT1 and Q-MT1.

The A-MT1, M-MT1, O-MT1 and Q-MT1 technical criteria evaluate a Bidder's capacity, and experience, in the provision and management of a Roster of individuals (within the healthcare field) at a volume consistent with Health Canada's requirement.

A Bidder's capacity and experience in the provision of Registered Nurses and/or Nurse Practitioners, consistent with Annex A, Statement of Work, will be evaluated through the RT1 point rated technical criteria (for all Regions).

B) For the purposes of the A-MT1, M-MT1, O-MT1 and Q-MT1 technical criteria, Canada will accept any role that provides preventative, curative, promotional and/or rehabilitative health care services in a systematic way to individuals, families or communities as a Healthcare Professional.

As a result, Canada would accept Midwives, Health Care Aides, Nursing Attendants, Hospital Orderlies, Health Care Attendants, Addiction Workers and Dietary Aides for the purposes of demonstrating mandatory technical criteria A-MT1, M-MT1, O-MT1 and Q-MT1.

Question 11:

To satisfy mandatory technical criterion A-MT3, M-MT3, O-MT3 and Q-MT3 the Bidder must submit a detailed outline of its proposed Contract Nurse Training Program (CNTP) in accordance with Appendix J of Annex A and should clearly describe for each section of the CNTP (i.e. sections A to I) the following pedagogical elements: Theory, Practicum and Assessment (Of Theory and Practicum).

The A-RT2.1, M-RT2.1, O-RT2.1 and Q-RT2.1 point rated technical criteria state that for each of the ten Key Service Requirements listed, Bidders should present a detailed description of its pedagogical approach, as incorporated in its proposed CNTP, including the theoretical and practicum components and, in addition, provide the methods as to how the Contract Nurses (CNs) are evaluated theoretically and in a practicum setting. The Bidder should also demonstrate how this training is integrated into its ongoing professional development of CNs.

We are concerned about the degree of overlap and duplication of content between A-MT3, M-MT3, O-MT3 and Q-MT3 and A-RT2.1, M-RT2.1, O-RT2.1 and Q-RT2.1. Here are four examples,

- Key Service Requirement 1), Maternal / *prenatal care, including high risk pregnancy,* is a component of Appendix J of Annex A, CNTP, section D), *Management and Assessment of Obstetrical, Gynecological and Newborn Clients.*

- Key Service Requirement 2) Newborn and pediatric assessment, including well baby assessments (Rourke and Nippissing) are components of of Appendix J of Annex A, CNTP, section D) *Management and Assessment of Obstetrical, Gynecological and Newborn Clients* and Appendix J of Annex A, CNTP, section C), *Management and Assessment of Pediatric Clients*.

- Key Service Requirement 3), *History and physical assessment of adults and older adults* are components of Appendix J of Annex A, CNTP, section B), *Management and Assessment of Adult Clients*.

- Key Service Requirement 10), *Emergency assessment and management,* is a component of Appendix J of Annex A, CNTP, section E), *General Emergencies and Major Trauma*.

We are fully aware of the fact that Bidders can cross-reference material. At this time of writing, the most comprehensive description of our Contract Nurse Training Program is presented in the A-MT3, M-MT3, O-MT3 and Q-MT3 Mandatory Technical Criteria Section. We are concerned about the following possible scenarios:

1. Precluding our ability to advance to Phase III of the Phased Bid Compliance Process due to cross-referenced material that is presented in a Point Rated Technical Criteria section; and

2. Compromising our ability to achieve the maximum points available for and A-RT2.1, M-RT2.1, O-RT2.1 and Q-RT2.1 (750 points worth 25% of the score) if we were to direct evaluators to A-MT3, M-MT3, O-MT3 and Q-MT3 for further detail.

We would appreciate some specific direction.

Finally, it should be noted that the scale of overlap and duplicated content to which we refer is significant.

Answer 11:
Bidders must determine how to best structure the format and content of their bid within the requirements of the RFP. Bidders should address clearly, and in sufficient depth, the points that are subject to the evaluation criteria against which the bid will be evaluated.

The ten Key Service Requirements identified in point rated technical criteria A-RT2.1, M-RT2.1, O-RT2.1 and Q-RT2.1 are criterial elements of the scope of the work that will be delivered by Contract Nurses for this requirement. As a result, although they are covered by the subject matter included in Appendix J of Annex A, the pedagogical approach to ensuring a contract nurse will acquire and maintain the necessary skill to perform their duties in these ten Key Service Requirements should be incorporated within the Bidder's proposed CNTP and are included in the point rated evaluation in order to ensure that the Contract Nurses are prepared for the unique challenges of working in Remote, Isolated, and Semi-Isolated communities.

To facilitate the evaluation of the bid, Canada requests that Bidders address and present topics in the order of the evaluation criteria under the same headings. To avoid duplication, Bidders may refer to different sections of their bids by identifying the specific paragraph and page number where the subject topic has already been addressed; however this is not mandatory. Canada will evaluate bids in accordance with Part 4 of the RFP. Whether or not a Bidder determines that the best approach is to structure their bid using

cross references or by duplicating information in order to address the evaluation criteria will be at the Bidder's discretion.

Question 12:

Can Canada please provide clarity on the following enquiry regarding *Part 3 – Bid Preparation Instructions, sub-section 3.1, e) Submission of Only One Bid:*

If a Bidder bids on a particular Region and the Bidder has named a proposed subcontractor as part of its bid, would that proposed subcontractor then be precluded from submitting a bid as a primary Bidder for a different Region?

Answer 12:

The 2003 (2017-04-27) Standard Instructions - Goods or Services - Competitive Requirements defines a Bidder as: "the person or entity (or, in the case of a joint venture, the persons or entities) submitting a bid to perform a contract for goods, services or both. It does not include the parent, subsidiaries or other affiliates of the Bidder, or its subcontractors."

Attachment 1 to Part 4, Technical Criteria (in all Regions), evaluates the experience, capacity, and proposed methodology of the Bidder and not that of any of its proposed subcontractors.

As a result, since proposed subcontractors do not form part of the bidding entity, under the example provided above, the proposed subcontractor could bid on any Region provided that they do so in accordance with Part 3, sub-section 3.1, e) of the RFP.

In addition, in accordance with Part 3, sub-section 3.1, e), (iii), individual members of a joint venture cannot participate in another bid, either by submitting a bid alone or by participating in another joint venture.

Question 13:

A) Under Annex F (Aboriginal Participation Component):

i. Can a Bidder submit a response to the solicitation if the bid contains solely Indirect Benefits?
ii. What is meant by Key Performance Indicator (KPI)?
iii. How does Health Canada intend to grant the PIF (Quebec $100,000.00)?

B) Under Annex G (Performance Measurement Framework); What is the proportion of points to be awarded under the Performance Evaluation Criteria (What is the percentage awarded under items a, b, c and d)?

Answer 13:

Please note that Bidders are not required to submit information with respect to Annex F, Aboriginal Participation Component (APC) nor Annex G, Performance Measurement Framework (PMF) as part of their bids.

In accordance with Annex A, Statement of Work (for all Regions), section 6, d), the Contractor must, within 30 calendar days of Contract Award, submit an Aboriginal Participation Component (APC) Plan to the APC Authority, for review and acceptance, describing how the Contractor will meet, or exceed, the minimum annual APC requirement as detailed in Annex F.

A) **i.** Canada requests that the Contractor meets the required Minimum Annual APC Transaction Value, to the best of its ability, through creation of Direct Benefits. A Contractor may meet the required Minimum Annual APC Transaction Value solely though Indirect Benefits, however doing so would result is a score of 0 points for Key Performance Indicator #4, as indicated in Annex G, Performance Management Framework and would hinder the Contractor's ability to obtain a Performance Incentive Fee (PIF) (see Annex G for further details).

ii. Please refer to Annex G, page 2 of 8, for a definition of a Key Performance Indicator (KPI). With respect to the APC, KPI 4 measures the amount of money spent by the Contractor on Direct Benefits as per the Aboriginal Participation Component.

iii. Please refer to Annex G, page 7 of 8, sections 32 and 33.

B) Please refer to Annex G, page 7 of 8, sections 32 and 33.

Question 14:
At article 1.2.8, Page 5 of 72, why is Quebec listed in the excluded locations of the bid?

Answer 14:
In accordance with article 1.2.8 of the RFP, only locations within Quebec that are subject to Comprehensive Land Claims Agreements (CLCAs) are excluded from the bid solicitation. None of the Locations of Work stated in Appendix H to annex A, Quebec Region, fall within a CLCA and therefore are not excluded from this solicitation.

Question 15:
At Attachment 1 to Part 4,Page 2 of 15, A-MT1 it states that: "The Bidder must demonstrate that they have a minimum of 24 calendar months of cumulative experience, within the last five years prior to solicitation issuance date, in the provision and management of a Roster of no less than 10 Healthcare Professionals within Canada."

Suggestion: As the Work conducted under the contract will be executed by Registered Nurses (RNs) and Nurse Practitioners (NPs), qualifying criteria for bidding on this RFP should reflect hours worked by RNs and NPs. Other Healthcare Professionals (e.g. Doctors, Personal Support Workers) will hold no influence on the selection process for a winning bid. We suggest that the term "Healthcare Professionals" be replaced by "RNs and NPs."

Answer 15:
The A-MT1, M-MT1, O-MT1 and Q-MT1 technical criteria evaluate a Bidder's capacity, and experience, in the provision and management of a Roster of individuals (within the healthcare field) at a volume consistent with Health Canada's requirement.

A Bidder's capacity and experience in the provision of Registered Nurses and/or Nurse Practitioners, consistent with Annex A, Statement of Work, will be evaluated through the RT1 point rated technical criteria (for all Regions).

As a result, the suggested change will not be applied and the RFP remains the same.

Question 16:
At Part 7, Page 51 of 72, subsection 1.2.3.3.2.1 it states: "The Contractor must acknowledge receipt of the TA Form to the TAA via email within 1 working day of receipt. The Contractor must within 3 working days, or within any longer time period as specified in the TA Form, provide the TAA who initiated the process with a signed and dated response prepared and submitted using the TA Form received from the TAA, containing at a minimum the information listed below:"

Suggestion: Due to the format of receiving each TA via its own e-mail message, coupled with the volume of TAs that the Contractor will consistently receive, we recommend that the acknowledgement email process only be reserved for urgent or emergency needs, and not included in the Regular TA process. Likewise, in order to effectively confirm an assignment and book travel in a timely fashion, we suggest that

the TA confirming the assignment be sent to the Contractor within 3 working days after the signed TA has been provided to Canada.

Answer 16:
Canada reviewed the suggested change and has determined that the current RFP best reflects Health Canada's operational requirement. As a result, the suggested change will not be applied and the RFP remains the same.

Question 17:
At Part 7, page 53 of 72, sub-section 1.2.3.3.4, it states: "For emergency processes, when services are to be requested during weekends, statutory holidays, or outside of regular business hours, Emergency Service Requests (ESR) will be issued by a delegated Health Canada representative against a preapproved TA for ESRs, using the Emergency Service Request form in Appendix 2 to Annex E."

Suggestion: During non-regular business hours, we recommend that it is stipulated that the need be communicated promptly via phone as well as e-mail, to ensure that the need is effectively received within the required timeframe.

Answer 17:
In each instance, and based on operational requirements, Canada will notify the Contractor of the ESR using a combination of one, or all, of the emergency communication methods listed in Annex A, Statement of Work (for all Regions), Section 7, c).

As a result, the suggested change will not be applied and the RFP remains the same.

Question 18:
At Part 7, Page 53 of 72, sub-section 1.2.3.3.4.1 it states: "Within the time period specified in the TA for ESRs Form, the Contractor must provide the TAA who initiated the process with a signed and dated response prepared and submitted using the TA for ESR Form received from the TAA.

Whenever urgent services are required during the pre-approved TA for ESRs period, a delegated Health Canada representative will initiate the ESR process. Within two hours, the Contractor must respond to the request by providing the delegated Health Canada representative with:

(1) the name of the proposed resource (as stated in the accepted workforce roster);
(2) the travel itinerary; and
(3) a completed, signed and dated response prepared and submitted using the ESR form."

Suggestion: To effectively confirm an urgent need in a timely fashion, we suggest that Canada also respond via phone and e-mail to proceed with booking a resource for an urgent need within 2 hours of the Contractor replying with the availability of a resource.

Answer 18:
Due to the nature of ESR requirements, and the pressing need for Canada to obtain a qualified Contract Nurse in those cases, Canada will always endeavour to respond to the Contractor as expeditiously as possible.

As a result, the suggested change will not be applied and the RFP remains the same.

Question 19:
At Part 7, Page 65 of 72, sub-section 7.10, i) it states:

"

(A) If the Contractor does not provide a replacement Contract Nurse within the timelines as stipulated in article 2.1.1 of the Contract, the Contractor must credit to Canada an amount equal to 50% of the firm Regular Hourly Rate of the required Contract Nurse for each day (or partial day) of delay (up to a maximum of 8 hours per workday) in providing the Contract Nurse, up to a maximum of 10 days total.

(B) In addition to 7.10 (i), (A) above, in the event that Canada must relocate a Health Canada nurse, or an alternate Contract Nurse, to backfill a position that the Contractor has not provided a replacement Contract Nurse in accordance with article 2.1.1 of the Contract, then the Contractor must provide a fee credit to Canada that is equal to the cost of all transportation associated with the temporary relocation of the Health Canada nurse (or an alternate Contract Nurse) to that Location of Work. Canada will provide the Contractor with copies of receipts demonstrating the costs incurred by Canada for temporary relocation of the Health Canada nurse or an alternate Contract Nurse for any fee credits claimed under this clause."

Suggestion: Parts A and B stipulate penalties for the Contractor failing to provide a replacement nurse in a scenario where the original nurse could not perform their duties. However, there are a multitude of situations a nurse may find themselves in where they would be unable to fulfill working the timeframe of their assignment. With that said, it is the nature of the agency to encourage the nurse in question to fulfill their duties and complete the entire length of the assignment. To the same extent, it is also within the best interests of the agency to find a replacement nurse to fulfill the needs of the assignment. It is only when all resources have been completely exhausted that an agency will not be able to fill the need with a replacement nurse. It is for these reasons that we suggest that Part A of Section 7.10 be removed from the RFP.

Answer 19:
As stated in Part 7, Page 65 of 72, sub-section 7.10, iv), the credits are liquidated damages and represent their best pre-estimate of the loss to Canada in the event of the applicable failure. No credit is intended to be, nor will it be construed as, a penalty.

Timelines for provision of a replacement Contract Nurse vary based on the reasoning as to why a Contract Nurse needs to be replaced and are stipulated in PART 7, Page 57 of 72, article 2.1.1.
As a result, the suggested change will not be applied and the RFP remains the same.

Question 20:
At Annex A – Manitoba, Page 10 of 12, Section 9, Location of Work, it states: "While the location of the requirement will be identified at the time of the initial Task Authorization, HC or their delegate(s) reserves the right to change the location of the delivery of services at any point prior to or during the Task Authorization due to operational requirements. In such circumstances, the Technical Authority or their delegates will endeavor to provide the Contractor with as much notice as possible of the change of Location of Work. Should a Contract Nurse refuse to change location, the Contract Nurse will be sent back to Designated Transportation Hub and the Contractor must provide a replacement of personnel in accordance with article 2.1.1 of the Contract."

Similar to Question 19 above, the reasoning in which a Contract Nurse refuses to change location during an assignment are varied and often valid. Reasons can include but are not limited to the following:

- BCR (Band Council)
- Loss of regular wages due to travel

- Safety issues, etc.

If a Contract Nurse provides a valid reason to their unwillingness to change locations, we suggest that the immediate action is not to send the nurse back to the Designated Transportation Hub, but to allow the nurse to fulfill their assignment at their currently stationed community and that Canada works with the Contractor to find an alternate solution. In addition, from cost saving perspective, relocation of resources in the middle of the assignment will add unnecessary additional costs to both Canada and supplier.

Answer 20:
Canada reviewed the suggested change and has determined that due to operational requirements the current RFP best reflects Health Canada's requirement. As a result, the suggested change will not be applied and the RFP remains the same.

Question 21:
With respect to Appendix A to Annex A for the Manitoba, there are zero out of province Designated Transportation Hubs (i.e. Ontario hubs); however there is a high volume of Manitoba licensed nurses who reside outside of the Manitoba Region. In order to achieve a higher fill rate we suggest adding the following cities, in addition to the existing designated transportation hubs, to the Manitoba Region:

- Toronto, ON
- Ottawa, ON

Answer 21:
Canada considers the Designated Transportation Hubs, as currently stated in Appendix A to Annex A for each Region, as appropriate and does not anticipate adding additional cities. However, Canada will accept alternate Designated Transportation Hubs where an equivalent cost, or cost savings, can be demonstrated to the satisfaction of the Task Authorization Authority (TAA).

Please see modifications 55 to 58.

Question 22:
At Annex A – Manitoba, Page 5 of 12 it states that:

"Health Canada reserves the right to request provision of a Contract Nurse with a specific gender in cases where it is warranted to do so based on a specific clinical requirement."

How often does Canada anticipate such requests to take place? How can Canada ensure that this type of request will be applied fairly in response to a critical need and will not be used for the purpose of excluding people or a certain gender from providing nursing services?

Answer 22:
At this time Canada cannot predict how often such a request will take place. The timing, location and duration of such requests are based on clinical operational requirements identified by nursing management. Canada does not intend to use this right to exclude or discriminate against persons of a certain gender from providing nursing services. The intent is to enable Canada to deliver appropriate health care to patients.

Question 23:
At Annex A – Manitoba, Page 5 of 12, describes a Pre-Placement Orientation (PPO).

a) Where will the pre-placement orientation be held?
b) With respect to Segment 2: 3 days on-site training, who will decide on the location to hold the orientation?

Answer 23:

a) At this time Canada anticipates that Segment 1 of the pre-placement orientation will be held in Winnipeg, Manitoba, however this location is subject to change. Confirmation of the Segment 1 location will be provided by Canada at the Start-Up Phase.
b) The location of Segment 2 of the pre-placement orientation will be decided by Canada. Confirmation of the Segment 2 location will be provided by Canada at the Start-Up Phase.

Question 24:

With respect to Annex A – Manitoba, Page 4 of 12, section 4, v), statutory holidays, in the event that a statutory holiday falls on a non-clinical day (i.e. Saturday or Sunday); stations are normally closed on the following weekday in lieu of the statutory holiday. Will the "weekday in lieu of the statutory holiday" be recognized as a statutory holiday?

Answer 24:

No. There is no provision for "in lieu" days for statutory holidays under the Contract. The Contractor will be paid in accordance with Annex B, Basis of Payment.

Question 25:

With respect to Annex B (All Regions), Page 3 of 7, sub-section 3.1.2, Travel Time While in Transit, in the event that it takes longer than expected while in transit, what would be the compensation rate for transit that is beyond the stated time frame, 06:00 am and 11:00 pm?

Answer 25:

The Contractor will be paid in accordance with Annex B, sub-section 3.1.2, for time in transit between the hours of 06:00 am and 11:00 pm (which represents Regular Working Hours). Time spent in transit after 11:00 pm will not be compensated until 06:00 am the following day (if the Contract Nurse is still in transit).

Question 26:

With respect to Annex B (All Regions), Page 4 of 7, 4.1, Professional Fees, based on historical data (current contracts), can Canada please provide the year to date data of how many contracts have been cancelled (more than 14 calendar days and less than 14 days) and provide the reasons for cancelling?

Answer 26:

To date Canada has not cancelled any of the three contracts issued under the previous RFP for these services (RFP #HT360-123541/C). With respect to cancellation of authorized Task Authorizations issued under the three existing contracts, approximately 44 TAs have been cancelled since December 2016. At this time Canada does not have the data tracking capability to provide a breakdown of this number by more than 14 calendar days and less than 14 calendar days nor by the reason for cancellation.

Question 27:

Based on what standard did Canada come up with a compensation of $250/day for cancelling assignments in less than 14 calendar days? $250/7.5 hours (regular working hours per day) = approximately $33.33 of hourly rate, which is substantially lower than the standard industrial pay rate.
In fairness, in the event Canada terminates a TA or reduces the period of services of TA less than 14 calendar days prior to the period of service start date as indicated in an authorized TA, and alternative assignments of similar duration and timeline of the period reduced, or terminated, have not been offered to the Contractor, the Contractor should be able to invoice Canada an amount equal to 50% of the firm Regular Hourly Rate of the required Contract Nurse for each day (or partial day) of delay (up to a maximum of 8 hours per workday) in providing the Contract Nurse, up to a maximum of 10 days total.

Answer 27:
Please see modifications 60 to 63.

Question 28:
HC requires a more qualified Registered Nurse (i.e. degree only) to work in Ontario than in Alberta, Manitoba or Quebec when the Canada wide FNIHB job postings, clinical guidelines/competencies, community health nurse role, etc. are the same. What is the rationale?

The change in education requirements in Ontario, from the current contract's requirement for a diploma or degree to degree only, may significantly reduce the number of qualified resources available to perform Work in Ontario.

Answer 28:
The educational requirement set for nurses working in Ontario Region under this RFP corresponds with the FNIHB Ontario Region's current internal staffing practice for nurses working in FNIHB Ontario Region's Remote & Isolated, and Semi-Isolated nursing stations.

Question 29:
With respect to Annex A – Manitoba, Page 9 of 12, Article 8:

A) Will Canada only accept a Transpiration of Dangerous Goods (TDG) certificate from certain providers?

B) Is there a cost associated with The Privacy Basics and Privacy Impact Assessments online course available on the publichealth.gc.ca/training site?

Answer 29:
A) Canada is not endorsing a particular TDG course or provider. The contractor must ensure that the TDG training corresponds to the requirements of nurses working in a remote and isolated locations and Transport Canada safety standards and regulations.

B) At this time there is no cost to with the online course.

Question 30:
It is to our understanding that Canada anticipates to award one contract per Region.(Alberta, Manitoba, Ontario, and Quebec). Please explain how each contract will be managed? Will each contract be monitored and managed by one Technical Authority, or will it be broken down by Region (i.e. for each contract, the Contractor will be dealing with the Technical Authority from the province where the services are required)?

Answer 30:
It is anticipated that each contract will be managed by the same Contracting Authority, Technical Authority, and Task Authorization Authorities regardless of their Region. At present, these authorities are located in the National Capital Region (NCR), however, this is subject to change and could be revised throughout the period of performance of the contracts. Any changes to the authorities will be applied through a contract amendment.

Question 31:
We have a request for clarification with respect to Amendment 003, page 2 of 8, modifications 24 and 25 which state:

"24. At Annex A, Statement of Work - Ontario, Page 1 of 12, Table of Contents:
DELETE: 13. Non-Compete……..Page 12

25. At Annex A, Statement of Work - Ontario, Page 12 of 12, Article 13:
DELETE: Article 13, Non-Compete, in its entirety."

Why has Canada deleted the non-compete clause?

Answer 31:
Following further review and analysis of the Non-Compete Clause a decision was made to remove the clause due to the complexity of managing such a clause in a decentralized operational environment.

Question 32:
We have a request for clarification with respect to Part 3, page 9 of 72, sub-section 3.1, c), (i) - Format of Bid which states: "Use 8.5 x 11 inch (216 mm x 279 mm) page formatting."

We would like to point out that the Excel attachment to the RFP, entitled Attachment 2 to part 4 including the schedules for MT1, RT1, RT2 and the Pricing Schedule, is formatted such that when it is printed, the default is a landscape format on legal size paper (8.5 X 14)

Can Canada clarify if this easy to read, and analyze legal format is acceptable.

Answer 32:
Canada confirms that the current print format, of landscape on legal size paper (8.5 X 14), is acceptable for Attachment 2 to part 4, Appendix MT1, Appendix RT1.1 and Appendix RT1.2.

Section 2: Modifications to the Solicitation

The Request for Proposals (RFP) is hereby modified as follows:

59. At Part 7, page 60 of 72, sub-section 2.2, Supplemental General Conditions:

DELETE: 4008 (2008-12-12), Personal Information, apply to and form part of the contract.

INSERT: **Personal Information**

01 Interpretation

1. In the Contract, unless the context otherwise requires,

"General Conditions"

means the general conditions that form part of the Contract;

"Personal Information"

means information about an individual, including the types of information specifically described in the *Privacy Act*, R.S. 1985, c. P-21;

"Record"

means any hard copy document or any data in a machine-readable format containing Personal Information;

2. Words and expressions defined in the General Conditions and used in these supplemental general conditions have the meanings given to them in the General Conditions.

3. If there is any inconsistency between the General Conditions and these supplemental general conditions, the applicable provisions of these supplemental general conditions prevail.

02 Ownership of Personal Information and Records

To perform the Work, the Contractor will be provided with and/or will be collecting Personal Information from third parties. The Contractor acknowledges that it has no rights in the Personal Information or the Records and that the Technical Authority owns the Records. On request, the Contractor must make all the Personal Information and Records available to the Technical Authority immediately in a format acceptable to the Technical Authority.

03 Use of Personal Information

The Contractor agrees to create, collect, receive, manage, access, use, retain, and dispose of the Personal Information and the Records only to perform the Work in accordance with the Contract.

04 Collection of Personal Information

1. If the Contractor must collect Personal Information from a third party to perform the Work, the Contractor must only collect Personal Information that is required to perform the Work. The Contractor must collect the Personal Information from the individual to whom it relates and the Contractor must inform that individual (at or before the time when it collects the Personal Information) of the following:

    a. that the Personal Information is being collected on behalf of, and will be provided to, the Technical Authority;

    b. the ways the Personal Information will be used;

    c. that the disclosure of the Personal Information is voluntary or, if there is a legal requirement to disclose the Personal Information, the basis of that legal requirement;

    d. the consequences, if any, of refusing to provide the information;

    e. that the individual has a right to access and correct his or her own Personal Information; and

f. that the Personal Information will form part of a specific personal information bank (within the meaning of the *Privacy Act*), and also provide the individual with information about which government institution controls that personal information bank, if the Technical Authority has provided this information to the Contractor.

2. The Contractor, its subcontractors, and their respective employees must identify themselves to the individuals from whom they are collecting Personal Information and must provide those individuals with a way to verify that they are authorized to collect the Personal Information under a Contract with Canada.

3. If requested by the Technical Authority, the Contractor must develop a request for consent form to be used when collecting Personal Information, or a script for collecting the Personal Information by telephone. The Contractor must not begin using a form or script unless the Contracting Authority first approves it in writing. The Contractor must also obtain the Contracting Authority's approval before making any changes to a form or script.

4. At the time it requests Personal Information from any individual, if the Contractor doubts that the individual has the capacity to provide consent to the disclosure and use of his or her Personal Information, the Contractor must ask the Technical Authority for instructions.

05 Maintaining the Accuracy, Privacy and Integrity of Personal Information

The Contractor must ensure that the Personal Information is as accurate, complete, and up to date as possible. The Contractor must protect the privacy of the Personal Information. To do so, at a minimum, the Contractor must:

a. not use any personal identifiers (e.g., social insurance number) to link multiple databases containing Personal Information;

b. segregate all Records from the Contractor's own information and records;

c. restrict access to the Personal Information and the Records to people who require access to perform the Work (for example, by using passwords or biometric access controls);

d. provide training to anyone to whom the Contractor will provide access to the Personal Information regarding the obligation to keep it confidential and use it only to perform the Work. The Contractor must provide this training before giving an individual access to any Personal Information and the Contractor must keep a record of the training and make it available to the Technical Authority if requested;

e. if requested by the Technical Authority, before providing anyone with access to the Personal Information, require anyone to whom the Contractor provides access to the Personal Information to acknowledge in writing (in a form approved by the Technical Authority) their responsibilities to maintain the privacy of the Personal Information;

f. keep a record of all requests made by an individual to review his or her Personal Information, and any requests to correct errors or omissions in the Personal Information (whether those requests are made directly by an individual or by the Technical Authority on behalf of an individual);

g. include a notation on any Record(s) that an individual has requested be corrected if the Contractor has decided not to make the correction for any reason. Whenever this occurs, the Contractor must immediately advise the Technical Authority of the details of the requested correction and the reasons for the Contractor's decision not to make it. If directed by the Technical Authority to make the correction, the Contractor must do so;

h. keep a record of the date and source of the last update to each Record;

i. maintain an audit log that electronically records all instances of and attempts to access Records stored electronically. The audit log must be in a format that can be reviewed by the Contractor and the Technical Authority at any time; and

j. secure and control access to any hard copy Records.

06 Safeguarding Personal Information

The Contractor must safeguard the Personal Information at all times by taking all measures reasonably necessary to secure it and protect its integrity and confidentiality. To do so, at a minimum, the Contractor must:

a. store the Personal Information electronically so that a password (or a similar access control mechanism, such as biometric access) is required to access the system or database in which the Personal Information is stored;

b. ensure that passwords or other access controls are provided only to individuals who require access to the Personal Information to perform the Work;

c. not outsource the electronic storage of Personal Information to a third party (including an affiliate) unless the Contracting Authority and the Technical Authority have first consented in writing;

d. safeguard any database or computer system on which the Personal Information is stored from external access using methods that are generally used, from time to time, by prudent public and private sector organizations in Canada in order to protect highly secure or sensitive information;

e. maintain a secure back-up copy of all Records, updated at least weekly;

f. implement any reasonable security or protection measures requested by the Technical Authority from time to time; and

g. notify the Contracting Authority and the Technical Authority immediately of any security breaches; for example, any time an unauthorized individual accesses any Personal Information.

07 Appointment of Privacy Officer

The Contractor must appoint someone to be its privacy officer and to act as its representative for all matters related to the Personal Information and the Records. The Contractor must provide that person's name to the Contracting Authority and the Technical Authority within ten (10) days of the award of the Contract.

08 Quarterly Reporting Obligations

Within thirty (30) calendar days of the end of each quarter (January-March; April-June; July-September; October-December), the Contractor must submit the following to the Technical Authority:

a. a description of any new measures taken by the Contractor to protect the Personal Information (for example, new software or access controls being used by the Contractor);

b. a list of any corrections made to Personal Information at the request of an individual (including the name of the individual, the date of the request, and the correction made);

c. details of any complaints received from individuals about the way in which their Personal Information is being collected or handled by the Contractor; and

d. a complete copy (in an electronic format agreed to by the Technical Authority and the Contractor) of all the Personal Information stored electronically by the Contractor.

09 Threat and Risk Assessment

Within ninety (90) calendar days of the award of the Contract and, if the Contract lasts longer than one year, within thirty (30) calendar days of each anniversary date of the Contract, the Contractor must submit to the Technical Authority a threat and risk assessment, which must include:

a. a copy of the current version of any request for consent form or script being used by the Contractor to collect Personal Information;

b. a list of the types of Personal Information used by the Contractor in connection with the Work;

c. a list of all locations where hard copies of Personal Information are stored;

d. a list of all locations where Personal Information in machine-readable format is stored (for example, the location where any server housing a database including any Personal Information is located), including back-ups;

e. a list of every person to whom the Contractor has granted access to the Personal Information or the Records;

f. a list of all measures being taken by the Contractor to protect the Personal Information and the Records;

g. a detailed explanation of any potential or actual threats to the Personal Information or any Record, together with an assessment of the risks created by these threats and the adequacy of existing safeguards to prevent these risks; and

h. an explanation of any new measures the Contractor intends to implement to safeguard the Personal Information and the Records.

10 Audit

The Technical Authority may audit the Contractor's compliance with these supplemental general conditions at any time. If requested by the Technical Authority, the Contractor must provide the Technical Authority (or the Technical Authority's authorized representative) with access to its premises and to the Personal Information and Records at all reasonable times. If the Technical Authority identifies any deficiencies during an audit, the Contractor must immediately correct the deficiencies at its own expense.

11 Statutory Obligations

1. The Contractor acknowledges that both the Contracting Authority, handling Personal Information and Records for contract administration purposes, and the Technical Authority are required to handle the Personal Information and the Records in accordance with the provisions of Canada's *Privacy Act*, *Access to Information Act*, R.S. 1985, c. A-1, and *Library and Archives of Canada Act*, S.C. 2004, c. 11. The Contractor agrees to comply with any requirement established by the Contracting Authority and the Technical Authority that is reasonably required to ensure that the Contracting Authority and the Technical Authority meet their obligations under these acts and any other legislation in effect from time to time. As a clarification, the Contracting Authority's handling of Personal Information and Records, for contract administration purposes, are limited to the cases as specifically detailed in these supplemental general conditions.

2. The Contractor acknowledges that its obligations under the Contract are in addition to any obligations it has under the *Personal Information Protection and Electronic Documents Act*, S.C. 2000, c. 5, or similar legislation in effect from time to time in any province or territory of Canada. If the Contractor believes that any obligations in the Contract prevent it from meeting its obligations under any of these laws, the Contractor must immediately notify the Contracting Authority and the Technical Authority of the specific provision of the Contract and the specific obligation under the law with which the Contractor believes it conflicts.

12 Disposing of Records and Returning Records to Canada

The Contractor must not dispose of any Record, except as instructed by the Technical Authority. On request by the Technical Authority, or once the Work involving the Personal Information is complete, the Contract is complete, or the

Contract is terminated, whichever of these comes first, the Contractor must return all Records (including all copies) to the Technical Authority.

13 Legal Requirement to Disclose Personal Information

Before disclosing any of the Personal Information pursuant to any applicable legislation, regulation, or an order of any court, tribunal or administrative body with jurisdiction, the Contractor must immediately notify the Contracting Authority and the Technical Authority, in order to provide the Contracting Authority and the Technical Authority with an opportunity to participate in any relevant proceedings.

14 Complaints

The Technical Authority and the Contractor each agree to notify the other immediately if a complaint is received under the *Access to Information Act* or the *Privacy Act* or other relevant legislation regarding the Personal Information. Each Party agrees to provide any necessary information to the other to assist in responding to the complaint and to inform the other immediately of the outcome of that complaint.

15 Exception

The obligations set out in these supplemental general conditions do not apply to any Personal Information that is already in the public domain, as long as it did not become part of the public domain as a result of any act or omission of the Contractor or any of its subcontractors, agents, or representatives, or any of their employees.

60. At Annex B, Basis of Payment – Alberta, Page 4 of 7, sub-section 4.1, Professional Fees:

DELETE: Sub-section 4.1, Professional Fees, in its entirety.

INSERT: **4.1 Professional Fees:**

4.1.1 There will be no charge to Canada for a TA terminated for convenience, or a reduction to the period of services of a TA, if written notification is provided to the Contractor 14 or more calendar days prior to the period of service start date as indicated in an authorized TA.

4.1.2 Where a TA is terminated for convenience by Canada with less than 14 calendar days prior to the period of service start date, as indicated in an authorized TA, and an alternative assignment(s) of a total duration equivalent to at least 75% of the original period of service, and a period of service start date within 3 calendar days (before or after) the terminated TA, have not been offered to the Contractor within 48 hours of the TA termination notice, the Contractor may invoice Canada at an amount equal to 50% of the firm Regular Hourly Rate of the required Contract Nurse for each day of the TA period of service (up to a maximum of 8 hours per workday), up to a maximum of 10 days total.

4.1.3 Where the period of services of a TA is reduced by more than 5 days by Canada less than 14 calendar days prior to the period of service start date, as indicated in an authorized TA, and an alternative assignment(s) of at least the

same duration and timeline to the period reduced have not been offered to the Contractor within 48 hours of the reduction notice, the Contractor may invoice Canada at an amount equal to 50% of the firm Regular Hourly Rate of the required Contract Nurse for each day of the reduction to the period of service (up to a maximum of 8 hours per workday), up to a maximum of 10 days total.

61. At Annex B, Basis of Payment – Manitoba, Page 4 of 7, sub-section 4.1, Professional Fees:

DELETE: Sub-section 4.1, Professional Fees, in its entirety.

INSERT: **4.1 Professional Fees:**

4.1.1 There will be no charge to Canada for a TA terminated for convenience, or a reduction to the period of services of a TA, if written notification is provided to the Contractor 14 or more calendar days prior to the period of service start date as indicated in an authorized TA.

4.1.2 Where a TA is terminated for convenience by Canada with less than 14 calendar days prior to the period of service start date, as indicated in an authorized TA, and an alternative assignment(s) of a total duration equivalent to at least 75% of the original period of service, and a period of service start date within 3 calendar days (before or after) the terminated TA, have not been offered to the Contractor within 48 hours of the TA termination notice, the Contractor may invoice Canada at an amount equal to 50% of the firm Regular Hourly Rate of the required Contract Nurse for each day of the TA period of service (up to a maximum of 8 hours per workday), up to a maximum of 10 days total.

4.1.3 Where the period of services of a TA is reduced by more than 5 days by Canada less than 14 calendar days prior to the period of service start date, as indicated in an authorized TA, and an alternative assignment(s) of at least the same duration and timeline to the period reduced have not been offered to the Contractor within 48 hours of the reduction notice, the Contractor may invoice Canada at an amount equal to 50% of the firm Regular Hourly Rate of the required Contract Nurse for each day of the reduction to the period of service (up to a maximum of 8 hours per workday), up to a maximum of 10 days total.

62. At Annex B, Basis of Payment – Ontario, Page 4 of 7, sub-section 4.1, Professional Fees:

DELETE: Sub-section 4.1, Professional Fees, in its entirety.

INSERT: **4.1 Professional Fees:**

4.1.1 There will be no charge to Canada for a TA terminated for convenience, or a reduction to the period of services of a TA, if written notification is provided to the Contractor 14 or more calendar days prior to the period of service start date as indicated in an authorized TA.

4.1.2 Where a TA is terminated for convenience by Canada with less than 14 calendar days prior to the period of service start date, as indicated in an authorized TA, and an alternative assignment(s) of a total duration equivalent to at least 75% of the original period of service, and a period of service start date within 3 calendar days (before or after) the terminated TA, have not been offered to the Contractor

within 48 hours of the TA termination notice, the Contractor may invoice Canada at an amount equal to 50% of the firm Regular Hourly Rate of the required Contract Nurse for each day of the TA period of service (up to a maximum of 8 hours per workday), up to a maximum of 10 days total.

4.1.3 Where the period of services of a TA is reduced by more than 5 days by Canada less than 14 calendar days prior to the period of service start date, as indicated in an authorized TA, and an alternative assignment(s) of at least the same duration and timeline to the period reduced have not been offered to the Contractor within 48 hours of the reduction notice, the Contractor may invoice Canada at an amount equal to 50% of the firm Regular Hourly Rate of the required Contract Nurse for each day of the reduction to the period of service (up to a maximum of 8 hours per workday), up to a maximum of 10 days total.

63. At Annex B, Basis of Payment – Quebec, Page 4 of 7, sub-section 4.1, Professional Fees:

DELETE: Sub-section 4.1, Professional Fees, in its entirety.

INSERT: **4.1 Professional Fees:**

4.1.1 There will be no charge to Canada for a TA terminated for convenience, or a reduction to the period of services of a TA, if written notification is provided to the Contractor 14 or more calendar days prior to the period of service start date as indicated in an authorized TA.

4.1.2 Where a TA is terminated for convenience by Canada with less than 14 calendar days prior to the period of service start date, as indicated in an authorized TA, and an alternative assignment(s) of a total duration equivalent to at least 75% of the original period of service, and a period of service start date within 3 calendar days (before or after) the terminated TA, have not been offered to the Contractor within 48 hours of the TA termination notice, the Contractor may invoice Canada at an amount equal to 50% of the firm Regular Hourly Rate of the required Contract Nurse for each day of the TA period of service (up to a maximum of 8 hours per workday), up to a maximum of 10 days total.

4.1.3 Where the period of services of a TA is reduced by more than 5 days by Canada less than 14 calendar days prior to the period of service start date, as indicated in an authorized TA, and an alternative assignment(s) of at least the same duration and timeline to the period reduced have not been offered to the Contractor within 48 hours of the reduction notice, the Contractor may invoice Canada at an amount equal to 50% of the firm Regular Hourly Rate of the required Contract Nurse for each day of the reduction to the period of service (up to a maximum of 8 hours per workday), up to a maximum of 10 days total.

64. At Annex E, TA Form, Page 1 of 3, Cost of Task, Cancellation Fee:

DELETE: Cancelation Fee, in its entirety

65. Health Canada will shortly be updating the Pharyngitis and Rheumatic Fever sections of the First Nations and Inuit Health Branch (FNIHB) Clinical Practice Guidelines for Nurses in Primary Care

(CPGs).

The above referenced CPGs as written at the date of RFP publication (November 3, 2017), will be used for evaluation purposes. Bidders should disregard *Chapter 2 - Adult Care – Ears, Nose, Throat and Mouth* and *Chapter 11 – Pediatric and Adolescent Care - Cardiovascular System* as published on Health Canada's website following December 4, 2017.

Bidders will find attached:

- *Chapter 2 - Adult Care – Ears, Nose, Throat and Mouth (last revised August 2011),* and
- *Chapter 11 – Pediatric and Adolescent Care - Cardiovascular System (last revised September 2011)*, for reference in the preparation of their bids.

ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED

CHAPTER 2 – EARS, NOSE, THROAT AND MOUTH

First Nations and Inuit Health Branch (FNIHB) Clinical Practice Guidelines for Nurses in Primary Care.
The content of this chapter was revised August 2011.

Table of Contents

ASSESSMENT OF THE EARS, NOSE, THROAT (ENT) AND MOUTH

HISTORY OF PRESENT ILLNESS AND REVIEW OF SYSTEMS

The following characteristics of each symptom should be elicited and explored:

- Onset (sudden or gradual)
- Chronology
- Current situation (improving or deteriorating)
- Location
- Radiation
- Quality
- Timing (frequency, duration)
- Severity
- Precipitating and aggravating factors
- Relieving factors
- Associated symptoms
- Effects on daily activities
- Previous diagnosis of similar episodes
- Previous treatments
- Efficacy of previous treatments

CARDINAL SYMPTOMS

Characteristics of specific symptoms should be elicited, as follows.

Ears

- Recent changes in hearing
- Compliance with and effectiveness of hearing aid
- Itching
- Earache
- Discharge
- Tinnitus
- Vertigo
- Ear trauma, including Q-tip use

Nose

- Nasal discharge or postnasal drip
- Epistaxis
- Obstruction of airflow
- Sinus pain, pressure
- Itching
- Anosmia
- Nasal trauma

Mouth and Throat

- Dental status
- Oral lesions
- Bleeding gums
- Sore throat
- Dysphagia (difficulty swallowing)
- Hoarseness or recent voice change

Neck

- Pain
- Swelling
- Enlarged glands

Other Associated Symptoms

- Fever
- Malaise
- Nausea or vomiting

PAST MEDICAL HISTORY (SPECIFIC TO ENT)

- Frequent ear or throat infections
- Rhinosinusitis
- Trauma to head or ENT area
- ENT surgery
- Audiometric screening results indicating hearing loss
- Allergies
- Smoking
- Prescription or over-the-counter medications used regularly

FAMILY HISTORY (SPECIFIC TO ENT)

- Others at home with similar symptoms
- Seasonal allergies
- Asthma
- Hearing loss
- Menière's disease
- ENT cancer

PERSONAL AND SOCIAL HISTORY (SPECIFIC TO ENT)

- Frequent exposure to water (swimmer's ear)
- Use of foreign object to clean ear
- Crowded living conditions
- Dental hygiene habits
- Exposure to smoke or other respiratory toxins
- Recent air travel
- Occupational exposure to toxins or loud noises

REVIEW OF SYSTEMS

Obtain a history about other relevant systems for the presenting concern. This may include information about the eyes, central nervous system, gastrointestinal system and/or respiratory system.

PHYSICAL EXAMINATION

GENERAL APPEARANCE

- Apparent state of health
- Degree of comfort or distress
- Colour (flushed or pale)
- Nutritional status (obese or emaciated)
- Match between appearance and stated age
- Difficulty with gait or balance

EARS

Inspection

- Pinna: lesions, abnormal appearance or position
- Canal: discharge, swelling, redness, wax, foreign bodies
- Ear drum: colour, light reflex, landmarks, bulging or retraction, perforation, scarring, air bubbles, fluid level
- Assess mobility of ear drum using pneumatic otoscope (if available)

Palpation

- Tenderness over tragus or mastoid process
- Tenderness on manipulation of the pinna

Estimate hearing with a watch or whisper test; perform screening audiometry or tympanography (if equipment available). Perform Weber and Rinne tests.

NOSE

Inspection

- External: inflammation, deformity, discharge, bleeding
- Internal: colour of mucosa, edema, deviated septum, polyps, bleeding points
- Transilluminate sinuses for dulling of light reflex
- Nasal vs. mouth breathing

Palpation

- Sinus (frontal and maxillary) and nasal tenderness

Percussion

- Sinus (frontal and maxillary) and nasal tenderness

MOUTH AND THROAT

Inspection

- Lips: colour uniformity (light to dark pink), lesions, symmetry of lips
- Oral mucosa and tongue: breath odour; colour; lesions of buccal mucosa, palate, tongue; tenderness of floor of mouth
- Gums *(see the section "Gingivitis" in this chapter)*: redness, swelling
- Xerostomia *(see the section "Xerostomia" in this chapter*) (dry mouth)
- Teeth: caries, fractures
- Throat: colour, tonsillar symmetry and enlargement, exudates, uvula midline

NECK

Inspection

- Symmetry
- Swelling
- Masses
- Redness
- Thyroid enlargement
- Active range of motion

Palpation

- Tenderness, enlargement, mobility (passive range of motion), contour and consistency of masses
- Thyroid: size, consistency, contour, position, tenderness

LYMPH NODES OF THE HEAD AND NECK

Palpation

- Tenderness, enlargement, mobility, contour and consistency of nodes
- Pre- or post-auricular nodes
- Anterior and posterior cervical nodes
- Tonsillar
- Submaxillary
- Submandibular
- Occipital

COMMON PROBLEMS OF THE EARS AND NOSE

ANTERIOR EPISTAXIS

Localized bleeding from the anterior portion of the nasal septum.

CAUSES

- Trauma and irritation
- Drying of nasal mucosa due to lack of humidity in environment
- Foreign-body irritation
- Nasal tumour (rare)

Predisposing Factors

- Allergic rhinitis
- Deviated nasal septum
- Infection of the upper respiratory tract
- Local vascular lesions
- Nasal polyps
- Cocaine use
- Nasal spray use
- Systemic coagulopathies
- Drugs (warfarin, NSAIDs)
- Hematological malignancies
- Hypertension
- Liver failure
- Uremia
- Blood dyscrasias (hemophilia, von Willebrand's disease)

HISTORY

- Exposure to one or more of the predisposing factors
- Usually unilateral
- Profuse bleeding or blood-streaked nasal discharge
- Determine duration, amount and frequency of bleeding
- Use of anticoagulants, ASA products or other medications such as topical nasal steroid sprays
- History of easy bruising or bleeding elsewhere (for example, melena, heavy menstrual periods)
- Family history of bleeding disorders (von Willebrand's disease)

PHYSICAL FINDINGS

- Examine client sitting up and leaning forward so that the blood will flow forward
- Blood pressure normal unless bleeding is severe enough to cause loss of volume
- Heart rate may be elevated because of fear or if bleeding is severe enough to cause loss of volume
- Obvious deformity or displacement may be present
- Bleeding from anterior portion of septum may be present
- Inspect throat for posterior bleeding
- Sinuses may feel tender
- Septum may be deviated

DIFFERENTIAL DIAGNOSIS

- Infection of nasal mucosa
- Dryness and irritation of nasal mucosa
- Nasal fracture
- Foreign body
- Tumor
- Tuberculosis
- Blood dyscrasias

DIAGNOSTIC TESTS

None.

MANAGEMENT

Goals of Treatment

- Stop loss of blood
- Prevent further episodes

Appropriate Consultation

Usually not necessary unless complications arise or serious underlying pathology is a concern.

Nonpharmacologic Interventions

Most bleeding will be stopped by application of pressure to both sides of the nose, with firm pressure against the nasal septum for 15–20 minutes.

Client Education

- Recommend increasing room humidity (client should keep a pot of water on the stove at all times, especially in winter)
- Counsel client about appropriate use of medications (dosage and side effects; avoidance of overuse)
- Recommend avoidance of known irritants and local trauma (nose-picking, forceful nose-blowing)
- Instruct client about first-aid control of recurrent epistaxis (sitting up and leaning forward; applying firm, direct pressure to soft part of nose)
- Recommend liberal use of lubricants such as petroleum jelly (for example, Vaseline) in the nares to promote hydration of the nasal mucosa
- Advise client to trim fingernails to avoid trauma from nose-picking

Pharmacologic Interventions

If direct pressure alone is insufficient to stop the bleeding, try a topical vasoconstrictor:

xylometazoline 0.1% drops (Otrivin)

Soak a cotton ball with the solution. Place the medicated cotton ball in the anterior portion of the nose. Press firmly against the bleeding nasal septum for 10–20 minutes.

If there is failure to control bleeding with this measure, nasal packing should be performed.

Anesthesia and vasoconstriction:[1]

- Soak cotton ball in a mix of 1% lidocaine with epinephrine (1:1000)
- Put 1–2 cotton balls into the bleeding nostril. (If bleeding is not clearly unilateral, put cotton balls into both nostrils.)
- Put a dry cotton ball at the external nares to prevent leakage and dripping
- Leave cotton balls in place for 10 minutes
- Pack the anterior nasal cavity with one-half inch ribbon gauze soaked in Vaseline layered anterior to as far posterior as possible, starting at the nasal floor and going toward the nasal roof. Leave in place for 2–3 days
- Nasal tampons or Gelfoam, if available, are alternatives to ribbon gauze

Monitoring and Follow-Up

Follow up to remove packing in 2–3 days.

Referral

Refer to a physician to rule out other pathologies if the problem is recurrent or if the client is older. If there has been trauma (for example, a fist fight), it is important to rule out septal hematoma. Management of hematoma of the nasal septum is surgical, and medevac is necessary.

CERUMINOSIS (IMPACTED CERUMEN)

Obstruction of the ear canal by cerumen (ear wax).

CAUSES

Cerumen is produced naturally by the ear canal and is normally cleared by the body's own mechanisms. Occasionally, cerumen is produced in excessive amounts and partially or totally occludes the ear canal.

HISTORY

- Ear pain
- Sensation of fullness
- Itching
- Conductive hearing loss

PHYSICAL FINDINGS

- Wax blocks canal
- Canal may be reddened and swollen
- Abnormal Weber and Rinne test results (evidence of conductive loss) may be present

DIFFERENTIAL DIAGNOSIS

- Foreign-body irritation
- Otitis media
- Otitis externa

COMPLICATIONS

- Hearing loss
- Otitis externa

DIAGNOSTIC TESTS

None.

MANAGEMENT

Goals of Treatment

- Remove wax
- Treat any underlying irritation of the canal

Appropriate Consultation

Consulting a physician is usually not necessary.

Nonpharmacologic Interventions

Sometimes it is helpful to soften the wax with a few drops of slightly warmed mineral oil or baby oil before attempting to irrigate the ear. Inject lukewarm water upward within ear canal with an ear syringe until wax is cleared (only do this if tympanic membrane is visible and intact).

To prevent ceruminosis, anyone who produces large amounts of cerumen can periodically (once or twice weekly) instill 3 drops of a 1:1 solution of hydrogen peroxide and water into each ear to decrease the likelihood of impaction. One or two drops of baby oil once or twice weekly will help to keep wax soft. Only instill a solution if the tympanic membrane is intact.

Monitoring and Follow-Up

Advise client to return as necessary if symptoms recur.

LABYRINTHITIS[2]

Disorder involving inflammation of the vestibular labyrinth in the inner ear. Most commonly presents as a self-limiting condition following a viral upper respiratory illness (URI). This section also includes benign positional vertigo.

CAUSES[3]

- Viral infection – influenza, parainfluenza, adenovirus, RSV, coxsackie, CMV, varicella zoster
- Bacterial infections (*S. pneumoniae, H. influenzae, M. catarrhalis, P. aeruginosa, P. mirabilis*): If found in nearby structures such as middle ear, such infections may cause the following:
  - Fluid to collect in the labyrinth (serous labyrinthitis)
  - Fluid to directly invade the labyrinth, causing pus-producing (suppurative) labyrinthitis
- Trauma or injury to head or ear
- Allergies
- Certain medications taken in high doses (for example, furosemide[4], ASA, some IV antibiotics, or phenytoin at toxic levels[5])
- Benign tumor of the middle ear
- Benign positional vertigo, where small stones or calcified particles break off within the vestibule and bounce around. The particles trigger nerve impulses that the brain interprets as movement
- Neuronitis
- Vasculitis
- Rarely, more serious causes of vertigo can mimic labyrinthitis, such as:
  - Tumors at the base of the brain
  - Strokes or insufficient blood supply to the brainstem or the nerves surrounding the labyrinth

HISTORY

- Vertigo (most prominent symptom)
- Dizziness
- Nausea and vomiting
- Fluctuating hearing loss
- Tinnitus
- Malaise
- Perspiration

PHYSICAL FINDINGS

- Diaphoresis
- Increased salivation
- Nystagmus

DIFFERENTIAL DIAGNOSIS

- Menière's disease
- Chronic bacterial mastoiditis
- Drug-induced damage to the vestibular labyrinth
- Acoustic neuroma
- Multiple sclerosis
- Temporal-lobe epilepsy

COMPLICATIONS

- Permanent hearing loss
- Falls potentially leading to injury
- Meningitis (if bacterial cause)

DIAGNOSTIC TESTS

None.

MANAGEMENT

Goals of Treatment

- Identify and treat underlying disorder if anything other than viral labyrinthitis is suspected
- Supportive treatment of symptoms only

Appropriate Consultation

Consult a physician if the client's symptoms persist for more than 1 week with therapy or if anything other than a simple viral illness is suspected.

Nonpharmacologic Interventions

Advise client to rest in a darkened room with eyes closed during acute attacks (otherwise, activity as tolerated).

Advise client to drink fluids in sufficient quantity to maintain hydration status.

If benign paroxysmal positional vertigo is suspected, instruct the patient to do the modified Epley exercise TID until free from vertigo for 24 hours. These modified Epley instructions are for the left side. Each side should be done once with every set of exercises:

- Start sitting in the middle of a bed, with a pillow behind, so if laying down it will be under your shoulders
- Turn head 45 degrees to left side (looking over shoulder)
- Lie back quickly with shoulders on pillow and head reclined onto the bed. Hold for 30 seconds
- Turn head only 90 degrees to the right (without raising it) and hold for 30 seconds
- Turn body and head another 90 degrees to the right and hold for 30 seconds
- Sit up on right side, with legs hanging down over side of bed

Pharmacologic Interventions

Treat nausea and vomiting:

dimenhydrinate (Gravol), 50 mg PO or rectal suppository q6h prn

Monitoring and Follow-Up

Follow up in 1 or 2 days to monitor symptom control. Ensure that the client remains hydrated if nausea or vomiting is significant.

Referral

Refer to a physician if anything other than viral labyrinthitis is suspected, especially if attacks are severe or recurrent. A neurology consult may be necessary to identify and treat underlying disorder.

MENIÈRE'S DISEASE (ENDOLYMPHATIC HYDROPS)

A disorder in which there is inadequate absorption of endolymph fluid in the inner ear so it accumulates and distorts the membranous labyrinth resulting in recurrent attacks of a cluster of symptoms.

CAUSES

Unknown, but the best theory suggests that it is an inner ear response to an injury (for example, reduced inner ear pressure, allergy, endocrine disease, lipid disorder, vascular disorder, viral infection).

Risk Factors

- Caucasian heritage
- Stress
- Allergy
- High salt intake
- Exposure to noise

HISTORY

- Occurs as episodic attacks lasting several hours with intervening periods of remission
- Fluctuating loss of low-frequency hearing
- Tinnitus
- Vertigo (spontaneous attacks lasting from 20 minutes to several hours)
- Sensation of fullness in the ear
- Nausea, vomiting
- Ataxia; falls may occur
- Prostration (inability to stand up because motion increases symptoms)

PHYSICAL FINDINGS

- Pallor
- Sweating
- Distress, prostration
- May be some measure of dehydration if vomiting is severe

– Audiometry testing with pure tones may show low-frequency sensorineural nerve loss and impaired speech distinction
– Tuning fork tests (Weber and Rinne) confirm validity of the audiometry results

DIFFERENTIAL DIAGNOSIS

– Viral labyrinthitis
– Benign positional vertigo
– Acoustic neuroma
– Syphilis
– Multiple sclerosis
– Vertebrobasilar disease

COMPLICATIONS

– Hearing loss
– Injury from falls during attacks
– Inability to work
– Failure to diagnose acoustic neuroma

DIAGNOSTIC TESTS

None.

MANAGEMENT

Goals of Treatment

– Control symptoms
– Ascertain underlying cause

Appropriate Consultation

Consult physician for help with diagnosis (not urgent so long as client is stable and symptoms are controlled with treatment).

Nonpharmacologic Interventions

Client Education

Counsel client about prevention of attacks:

– stress-reduction strategies
– avoidance of excessive salt intake
– smoking cessation
– reduction of alcohol intake
– avoidance of ototoxic medications such as acetylsalicylic acid (ASA)

Bed rest as necessary until vertigo settles.

Pharmacologic Interventions

For acute attack, control nausea and vomiting:

dimenhydrinate (Gravol), 50 mg PO or rectal suppository q6h prn

Monitoring and Follow-Up

Assess hearing at least annually in clients with stable symptoms.

Referral

Refer to a physician if symptoms are not controlled or if hearing loss is evident. A neurology consult may be necessary to identify and treat underlying disorder.

OTITIS EXTERNA[6]

Infection or inflammation of the ear canal, which presents in two forms:

– A benign painful infection of the outer canal
– Malignant (necrotizing) otitis externa is a potentially lethal form that usually occurs in elderly, immunocompromised or diabetic patients. Involves bacterial spread to the cartilage of the external ear with pain and edema. It may be accompanied by a fever and systemic manifestations of infection

CAUSES

– Gram-negative rods: Proteus, Pseudomonas
– Gram-positive cocci (less common): Staphlylococcus, Streptococcus
– Fungal infection (for example, candidiasis)

Predisposing Factors

– Hearing aids
– Narrow ear canal
– Use of cotton-tipped applicators
– Use of ear plugs
– Swimming

Risk Factors

– Immunocompromised status, for example:
  – Patients with diabetes
  – Patients on immunosuppressant medication
  – Post-transplant surgery
  – Chronic systemic steroid use

HISTORY

- Ear pain (otalgia)
- Pruritus or irritation
- Purulent discharge from canal (cheesy white, greenish blue or gray)
- Recent exposure to water or mechanical trauma
- Reduced hearing or feelings of fullness in ear may be present
- Unilateral headache may be present

PHYSICAL FINDINGS

- Temperature may be elevated
- Redness and edema of ear canal
- Purulent exudate or debris in canal
- Tympanic membrane usually normal (may be slightly reddened)
- If edema and debris are severe, it may be impossible to visualize the tympanic membrane
- Manipulation of pinna or pressure on tragus causes pain
- Peri-auricular and anterior cervical nodes may be enlarged and tender

DIFFERENTIAL DIAGNOSIS

- Acute otitis media with perforation
- Skin condition involving the ear (for example, eczema)
- Mastoiditis
- Furuncle in canal
- Foreign-body irritation

COMPLICATIONS

- Severe otitis externa with closure of canal
- Cellulitis of the external ear and face

DIAGNOSTIC TESTS

None. Swab for culture and sensitivity is not routinely indicated.

MANAGEMENT

Goals of Treatment

- Relieve pain
- Prevent recurrence
- Eradicate infection

Appropriate Consultation

Consultation usually not needed, unless complicated by cellulitis of the external ear or face, the problem is recurrent, the therapy failed, systemic symptoms are present (for example, fever), the client is immunocompromised (for example, diabetic) or malignant otitis externa is suspected.

Nonpharmacologic Interventions

Debriding the canal is critical, and the importance of this step cannot be overemphasized. Clean the outer ear and the canal with normal saline and gently debride the area of debris and exudate with a gauze wick.

If there is significant drainage or if there is threat of further narrowing, an ear wick (1 inch [2.5 cm] of cotton or gauze) threaded gently into the canal and left there will help keep the canal open and ensure that medicated drops reach the distal part of the canal. The wick will eventually fall out as edema subsides or can be removed after 2–3 days.

Client Education

- Counsel about appropriate use of medications (if possible, have another family member instill drops and clean the ear)
- Counsel about proper ear hygiene before instilling medications
- Advise client about preventing recurrent irritation (for example, client should not use cotton-tipped applicators in the ears)
- Recommend proper drying of ears after swimming or use of ear plugs while swimming, bathing or showering
- Counsel client about proper hygiene of hearing aids and ear plugs

For recurrent episodes, start the client on prophylactic measures:

Burrow's solution (Buro-Sol otic solution), 2 or 3 drops after swimming or showers

or

solution of half vinegar and half sterile water, 2 or 3 drops after swimming or showers

Pharmacologic Interventions[7]

Manage pain with simple analgesics:

acetaminophen (Tylenol) 325 mg, 1–2 tabs PO q4-6h prn

As otitis externa can be very painful, stronger analgesia may be necessary if acetaminophen does not control pain.

Otitis Externa (Acute Uncomplicated):

If there is no danger of perforated tympanic membrane, start:

gramicidin/polymyxin (Optimyxin) eye/ear solution 4 drops qid for 7 days

If the tympanic membrane cannot be visualized or is perforated:

ciprofloxacin/dexamethasone (Ciprodex) otic solution, 4 drops bid for 7 days

Malignant (Necrotizing) Otitis Externa:

Contact physician as treatment requires parenteral antibiotics with coverage for *Pseudomonas* species (for example, ciprofloxacin) in addition to hospital care.

Fungal Otitis Externa (Otomycosis):

Fungal organisms can cause otitis externa, especially in immunocompromised patients. In mild to moderate cases of otitis externa due to fungi, treat with antifungal agents:

clotrimazole 1% cream (Canesten), apply bid for 7 days

or

Locacorten Vioform otic drops, 2 drops bid for 7 days (can be obtained from a retail pharmacy)

Monitoring and Follow-Up

Follow up 7 days after course of therapy is complete. Instruct client to return sooner if pain increases or if fever develops despite therapy.

Referral

Immediately refer cases of malignant (necrotizing) otitis externa to a hospital after consultation with a physician, especially clients with comorbid conditions (such as an immunocompromised status or diabetes). They require admission to hospital for intravenous (IV) antibiotic therapy.

OTITIS MEDIA, ACUTE[8]

Infection of the middle ear.

CAUSES

- Viral in 25% of cases
- Bacterial forms due to *Streptococcus pneumoniae* (primarily), *Haemophilus influenzae*, *Moraxella catarrhalis*

Active or passive smoking is a major predisposing factor.

HISTORY

- General malaise and fever
- Ear pain (throbbing)
- Sensation of fullness
- Hearing decreased
- Tinnitus or roaring in ear, vertigo
- Purulent discharge if drum perforated
- Infection of the upper respiratory tract may be present concurrently or may precede the otitis media

PHYSICAL FINDINGS

- Temperature may be elevated
- Client may be mildly or moderately ill
- Tympanic membrane red, dull, bulging
- Bony landmarks obscured or absent
- Possible perforation and purulent discharge in canal
- Decreased mobility of tympanic membrane (as noted with pneumatic otoscope if available)
- Bullae seen on tympanic membrane (but only in cases of mycoplasma infection)
- Peri-auricular and anterior cervical nodes enlarged and tender

DIFFERENTIAL DIAGNOSIS

- Acute otitis externa
- Transient middle-ear effusion (not an infection)
- Mastoiditis
- Trauma or foreign-body irritation
- Referred ear pain from dental abscess or temporomandibular joint dysfunction

COMPLICATIONS

- Reduced hearing
- Serous otitis media
- Mastoiditis
- Chronic otitis media
- Meningitis
- Epidural abscess
- Cholesteatoma

DIAGNOSTIC TESTS

None. Swab for culture and sensitivity if there is discharge.

MANAGEMENT

Goals of Treatment

- Eradicate infection
- Relieve pain
- Prevent complications

Appropriate Consultation

Usually not necessary if condition is uncomplicated.

Nonpharmacologic Interventions

Client Education

- Recommend increased rest in the acute febrile phase
- Counsel client about appropriate use of medications (dosage, compliance, follow-up)
- Explain disease course and expected outcome (serous otitis media may persist for several weeks)
- Recommend avoidance of flying until symptoms have resolved

Pharmacologic Interventions[7]

To relieve pain and fever:

acetaminophen (Tylenol), 325 mg, 1–2 tabs PO q4-6h prn

Antibiotic therapy:

amoxicillin (Amoxil), 500 mg PO tid for 7 days

or

azithromycin (Zithromax) 500 mg PO on first day then 250 mg PO od for 4 days

Monitoring and Follow-Up

- Instruct client to return in 3 days if symptoms do not improve or if symptoms progress despite therapy
- Follow up in 7 days: look for development of serous otitis media
- Assess hearing 1 month after treatment if any symptoms persist

Referral

Not necessary if condition is uncomplicated.

OTITIS MEDIA, CHRONIC SUPPURATIVE[9]

Nonresolving or recurrent low-grade infection of the middle ear associated with perforation of the tympanic membrane.

It can become a dangerous clinical problem if it spreads from being a simple mucosal disease to causing in-growth of stratified epithelium into the middle ear (a cholesteatoma), although such conditions are rare.

CAUSES

- Generally develops as a consequence of recurrent acute otitis media and tympanic membrane rupture
- *Proteus, Pseudomonas or Staphylococcus* (usually polymicrobial)

HISTORY

- Hearing decreased
- Continuous foul-smelling discharge from the ear
- Tinnitus
- Usually no pain, occasional dull ache
- No fever

PHYSICAL FINDINGS

- Client appears generally well
- Foul-smelling purulent drainage from ear canal
- Perforation of tympanic membrane
- Conductive hearing loss

DIFFERENTIAL DIAGNOSIS

- Chronic otitis externa
- Sub-acute otitis media

COMPLICATIONS

- Permanent, severe hearing loss
- Mastoiditis
- Cholesteatoma

DIAGNOSTIC TESTS

None. Swab any drainage for culture.

MANAGEMENT

Goals of Treatment

- Prevent complications
- Avoid unnecessary use of antibiotics

Appropriate Consultation

Consult a physician immediately if a cholesteatoma is suspected.

Nonpharmacologic Interventions

Client Education

- Explain disease process and expected course
- Counsel client about appropriate use of medications (including compliance)
- Aural irrigation is an effective therapy prior to instillation of drops. If possible a solution of 50% peroxide and 50% sterile water can be used. Thirty to 40 mL of this solution can be irrigated through the external auditory canal, using a small syringe or bulb-type aspirator. The irrigant solution can be allowed to drain out for 5–10 minutes prior to instilling the ototopical antimicrobial
- Recommend against using Q-tips for cleaning
- Recommend proper drying of ears after swimming, bathing or showering; use of ear plugs while swimming
- Counsel client about proper hygiene of hearing aids and ear plugs

To prevent recurrence, recommend that ear canal be cleaned with:

Burrow's solution (Buro-Sol otic solution)

or

solution of half vinegar and half sterile water, 4–6 drops in the ear after exposure to water

Pharmacologic Interventions

Mild chronic suppurative otitis media:

Topical antibiotic ear drop alone is sufficient:

ciprofloxacin/dexamethasone (Ciprodex) otic drops, 4 drops bid for 7 days

Moderate chronic suppurative otitis media:

If there is significant soft-tissue involvement, systemic antibiotics may be indicated in addition to topical therapy with ear drops. Consult a physician for advice about choice of systemic antibiotics. One option is:

ciprofloxacin/dexamethasone (Ciprodex) otic drops, 4 drops bid for 7 days

and

levofloxacin 500 mg once daily

Monitoring and Follow-Up

Follow up in 7 days.

Referral

Referral to ear, nose and throat (ENT) specialist may be necessary if treatment fails or complications develop. Surgical intervention is sometimes required. In some cases, referral is done by the nurse, but usually it is done by a consulting physician.

OTITIS MEDIA, SEROUS (OTITIS MEDIA WITH EFFUSION)

Presence of non-infective fluid in the middle ear for longer than 3 months without symptoms or signs of acute infection. Tympanic membrane is intact.

CAUSES

- Dysfunction of eustachian tube
- Nasal obstruction, nasal polyps

Predisposing Factors

- Viral infection of the upper respiratory tract
- Allergies
- Barotrauma
- Enlargement of adenoids
- Recent acute otitis media

HISTORY

- Exposure to one of the predisposing factors
- Reduced hearing in affected ear
- Sensation of fullness in ear
- Nose and ears may be itchy
- Pain mild or absent
- Fever absent

PHYSICAL FINDINGS

- Tympanic membrane intact, dull, retracted or hypomobile
- Presence of clear fluid, air bubbles or air-fluid level behind the tympanic membrane
- Bony landmarks usually accentuated because of retraction of the tympanic membrane
- Audiometric screening may show a decrease in hearing
- Abnormal Weber and Rinne test results (evidence of conductive loss) may be present

DIFFERENTIAL DIAGNOSIS

Nasopharyngeal tumour (if problem longstanding).

COMPLICATIONS

- Secondary infection (purulent acute otitis media)
- Chronic serous otitis media
- Hearing loss

DIAGNOSTIC TESTS

None.

MANAGEMENT

Goals of Treatment

- Identify underlying cause
- Relieve symptoms
- Prevent hearing loss

Appropriate Consultation

Consult a physician if the client has effusion with significant hearing loss (more than 20 dB), if effusion is bilateral with hearing loss or if effusion persists for more than 2–3 months.

Nonpharmacologic Interventions

Client Education

- Explain disease process and expected outcomes
- Offer support and reassurance, as symptoms can last a long time (2–3 months)
- Counsel client about appropriate use of medications (dosage and compliance)
- Recommend against flying until signs and symptoms have resolved, if possible
- If client must fly, recommend the use of topical nasal decongestant (for example, xylometazoline [Otrivin]) 1 hour prior to flight in addition to appropriate doses of systemic oral decongestants (for example, pseudoephedrine [Sudafed])
- Discuss signs and symptoms of purulent otitis media; advise client to return to clinic if they occur
- Instruct client to gently try to equalize pressure between middle ear and throat, using a simple maneuver such as yawning or chewing gum

Pharmacologic Interventions

Most studies indicate that antihistamines and decongestants are ineffective, but some clients may derive symptomatic relief.

Oral decongestant can be obtained from a retail pharmacy:

> pseudoephedrine (Sudafed), 30–60 mg PO tid or qid for 4–7 days (Maximum dose: 240 mg/day)
>
> Note: this frequency is for regular-release pseudoephedrine; long-acting preparations must be dosed accordingly.

Start with the smaller dose and lower frequency. Instruct client to increase dose slowly to minimize any side effects (such as restlessness, insomnia, irritability, tremor).

Do not prescribe decongestants for elderly clients, for people with hypertension, heart disease, peripheral vascular disease, diabetes, hyperthyroidism, previous acute angle-closure glaucoma, previous urinary retention or prostatic hypertrophy, or for anyone taking monoamine oxidase inhibitors or tricyclic antidepressants.

Oral antibiotics may be prescribed for those with persistent bilateral effusions causing significant hearing loss. Consultation with a physician is recommended in these situations.

Monitoring and Follow-Up

Monitor the response to therapy in 2–4 weeks. In particular, note any improvement in hearing or decrease in tinnitus.

Reassess hearing, preferably with screening audiometry (if available).

Referral

Refer to an ENT physician if effusion persists after 3 months.

RHINITIS

Inflammation of the mucosal lining of the nasal cavity leading to nasal congestion and rhinorrhea (runny nose). The 3 most common types of rhinitis to consider in the differential diagnosis of rhinitis are:

- *Allergic rhinitis*: Reactive inflammation of the nasal mucosa
- *Vasomotor rhinitis*: Perennial inflammation of the nasal mucosa, which represents a hyperreactive state of the nasal mucosa (nonallergic)
- *Viral rhinitis (infection of upper respiratory tract)*: Viral infection confined to the upper respiratory tract. Usually mild and self-limiting

CAUSES

Allergic Rhinitis

- Sensitivity to inhaled allergens (pollens, grasses, ragweed, dust, molds, animal dander, smoke)

Vasomotor Rhinitis

- Unknown; symptoms do not correlate with exposure to specific allergens
- Atrophic mucosa (in the elderly)
- Attacks may be triggered by abrupt changes in temperature or barometric pressure, odours, emotional stress or exercise

Viral Rhinitis (Infection of Upper Respiratory Tract)

- Numerous viral agents

HISTORY

Allergic Rhinitis

- Seasonal or perennial symptoms
- History of familial allergies (for example, ASA)
- Asthma or eczema may be present
- Paroxysmal sneezing
- Itchy nose
- Nasal congestion
- Excessive, continuous, clear, watery nasal discharge
- Eyes may be itchy or watery
- Ears may be itchy
- General malaise and headache may be present
- Symptoms worst in the morning and least during the day, worsening again during the night
- Postnasal drip
- Breathing through the mouth
- Snoring and dry cough at night may be present

Vasomotor Rhinitis

- Sudden onset of nasal congestion
- Perennial symptoms
- Persistent postnasal drip
- Intermittent throat irritation
- No response to environmental controls and medications
- Sensation of constantly needing to clear throat
- Changes in acuity of hearing or smell
- Snoring at night
- Fatigue

Viral Rhinitis (Infection of Upper Respiratory Tract)

- Nonproductive cough or cough that produces clear sputum
- Low-grade fever
- Nasal congestion with clear nasal discharge
- Sneezing
- Postnasal drip
- Scratchy throat
- Mild headache and general malaise
- Pressure in ears

PHYSICAL FINDINGS

Allergic Rhinitis

- Injected conjunctiva may be present
- Eyes may tear
- Edema of the eyelids and periorbital area may be present
- Pale, edematous nasal mucosa is pink, with clear thin secretions
- Nasal polyps may be present
- Skin around nose may be irritated
- “Allergic salute” may be present
- Sinuses may feel tender if symptoms are severe
- Mouth breathing

Vasomotor Rhinitis

- Vital signs usually normal
- Nasal mucosa red and swollen
- Nasal turbinates enlarged
- Throat may be slightly reddened because of irritation from postnasal drip
- Tonsils and adenoids may be enlarged
- Sinuses may feel tender if symptoms are severe

Viral Rhinitis (Infection of Upper Respiratory Tract)

- Temperature may be slightly elevated
- Client appears mildly ill
- Clear nasal discharge
- Skin around nares slightly irritated
- Ears may have transient, middle-ear sterile effusion
- Throat may have mild erythema, but otherwise is normal
- Sinuses may feel tender if symptoms are severe

DIFFERENTIAL DIAGNOSIS (ALL TYPES OF RHINITIS)

- Acute or chronic sinusitis
- Abuse of nose drops
- Abuse of drugs or solvents (for example, cocaine, gas, glue)
- Foreign body in nares
- Nasal polyps
- Deviated septum
- Hypothyroidism as a cause of the nasal congestion
- Nasal congestion induced by pregnancy or use of oral contraceptives

COMPLICATIONS (ALL TYPES OF RHINITIS)

- Otitis media
- Nasal polyps
- Epistaxis
- Enlargement of tonsils and adenoids
- Sinusitis

DIAGNOSTIC TESTS (ALL TYPES OF RHINITIS)

Consider skin testing for allergies.

MANAGEMENT (ALL TYPES OF RHINITIS)

Goals of Treatment

- Relieve and suppress symptoms
- Identify the underlying allergen(s)
- Prevent complications

Appropriate Consultation

Consultation with a physician is not usually required.

Nonpharmacologic Interventions

Environmental control is important. Eliminate or reduce known allergen(s) in the environment wherever possible, or avoid them altogether.

Client Education

- Recommend increasing fluid intake to improve hydration
- Counsel client about appropriate use of medications (dose, frequency, side effects, avoidance of overuse)
- Recommend avoidance of caffeine
- Recommend avoidance of known allergens (client should keep living area clear of dust, avoid going outside when pollen count is high and use synthetic fibres in bedding and clothing) and removal of pets (to eliminate animal dander)
- Counsel client about preventing spread of viral rhinitis to other household members
- Recommend frequent hand-washing, appropriate disposal of used facial tissues and covering of mouth and nose when coughing or sneezing

Pharmacologic Interventions

Allergic and Vasomotor Rhinitis:

Saline nasal drops/salinex nasal spray, prn, to wash out mucus and any inhaled allergen.

Oral antihistamines to treat acute symptoms of runny nose, sneezing, itch and conjunctival symptoms (but these will not help nasal congestion):

cetirizine (Reactine), 10 mg PO daily to be taken as long as the patient is in contact with the allergen

Topical nasal steroids are the mainstay of therapy for chronic allergic rhinitis and chronic vasomotor rhinitis and for maintenance and prophylactic treatment of these conditions. They can be used alone or in combination with the antihistamine and decongestant regimen.

Consult a physician about the use of inhaled nasal steroids/parasympathetic blockers if oral antihistamines and decongestants (*see "viral rhinitis"*) are not effective. For example:

fluticasone (Flonase/generics), 50 µg/spray, 2 sprays/nostril daily

or

triamcinolone (Nasocort AQ), 55 µg/spray, 2 sprays/nostril daily

Viral Rhinitis:

Oral antihistamines and decongestants, which can be obtained from a retail pharmacy, can be tried for a maximum 4–7 days, to avoid rebound effect:

pseudoephedrine (Sudafed), 30–60 mg PO tid or qid for 4–7 days (Maximum dose: 240 mg/day)

Note: this frequency is for regular-release pseudoephedrine; long-acting preparations must be dosed accordingly.

Antihistamines have little proven benefit in the treatment of the common cold, including viral rhinitis.

Do not prescribe decongestants for elderly clients, for people with hypertension, heart disease, peripheral vascular disease, diabetes, hyperthyroidism, previous acute angle-closure glaucoma, previous urinary retention or prostatic hypertrophy, or for anyone taking monoamine oxidase inhibitors or tricyclic antidepressants.

Manage fever:

acetaminophen (Tylenol), 325 mg, 1–2 tabs PO q4-6h prn

Monitoring and Follow-Up

Instruct client to return for further assessment if fever develops or if symptoms have not resolved within 14 days.

Referral

Refer to a physician if symptoms of rhinitis are not controlled with initial treatment. Allergy testing, sinus radiography or other medications may be required.

RHINOSINUSITIS, ACUTE[10,11]

Infection of mucosal lining of the paranasal sinuses (symptoms present less than 4 weeks and with less than 3 episodes per year).

Maxillary sinuses most commonly affected.

CAUSES

- Common: *Haemophilus influenzae, Moraxella catarrhalis, Streptococcus pneumonia*
- Less common: *Chlamydia pneumoniae, Streptococcus pyogenes, viruses, fungi*

Predisposing Factors

- Common cold
- Allergies
- Deviated nasal septum
- Smoking
- Adenoidal hypertrophy
- Dental abscess
- Nasal polyps
- Trauma
- Foreign body
- Diving or swimming
- Neoplasms
- Cystic fibrosis

HISTORY

- Exposure to one or more of the predisposing factors
- Headache
- Facial pain
- Nasal congestion
- Pressure over involved sinuses increases when bending forward
- Purulent nasal discharge, which may be tinged with blood, can be present
- Dental pain, especially of upper incisor and canine teeth
- General malaise may be present
- Fever may be present
- Postnasal drainage
- Hyposmia/anosmia
- Ear pressure/fullness

PHYSICAL FINDINGS

- Temperature may be mildly elevated
- Client appears mildly to moderately ill
- Irritation of skin around nares
- Swollen nasal mucosa may be pale or dull red
- Nasal polyp may be present
- Dental abscess may be present
- Tenderness over involved sinuses
- Poor transillumination of sinuses
- Tenderness over a tooth
- Anterior cervical nodes may be enlarged and tender
- Cough may be present

DIFFERENTIAL DIAGNOSIS

- Dental abscess
- Nasal polyp(s)
- Tumour
- Presence of foreign bodies
- Periorbital cellulitis
- Infection of upper respiratory tract
- Allergic rhinitis
- Vasomotor rhinitis
- Cluster headache
- Migraine headache

COMPLICATIONS

- Contiguous spread of infection to intraorbital or intracranial structures
- Chronic sinusitis
- Periorbital cellulitis

DIAGNOSTIC TESTS

None.

MANAGEMENT

Goals of Treatment

- Make the correct diagnosis
- Identify predisposing factors and treat the conditions
- Treat the infection as indicated
- Identify any underlying dental abscess
- Relieve symptoms

Appropriate Consultation

Usually not necessary unless does not resolve with treatment, symptoms progress within 2–3 days or complications arise.

Nonpharmacologic Interventions

Apply moist heat (such as with steam inhalation or warm compresses) to sinuses to help relieve pressure by loosening and liquefying thickened secretions. Saline nose drops also help to do this.

Client Education

- Recommend increased rest during acute phase
- Recommend increasing hydration (6–8 glasses of fluid per day)
- Counsel client about appropriate use of medications (dose, frequency, side effects)
- Recommend avoidance of irritants (for example, smoke)
- Recommend avoidance of swimming, diving or flying during acute phase

Pharmacologic Interventions[7]

Saline nasal drops/salinex nasal spray, prn may be helpful.

Nasal decongestant sprays or drops may be used for the first 24–48 hours if congestion is marked. Topical decongestants are more effective than oral ones. Client should not use antihistamines because these dry and thicken the secretions:

xylometazoline (Otrivin), 0.1% nasal drops, 1–3 drops q8-12h prn for a maximum of 4 days

It is very important to limit the use of a topical nasal decongestant to a period of 3 or 4 days to prevent development of "rebound" nasal congestion when the nasal spray is withdrawn (a complication called rhinitis medicamentosa).

Manage pain and fever with simple analgesics:

acetaminophen (Tylenol), 325 mg, 1–2 tabs PO q4h prn

or

ibuprofen (Motrin), 200 mg, 1–2 tabs PO q4h prn

Approximately 70% of cases of acute sinusitis will resolve without antibiotic treatment. However, if symptoms continue for longer than 10 days or worsen after 5 days, consider antibiotic therapy.

Oral antibiotics:

amoxicillin (Amoxil), 500 mg PO tid for 10 days

or if allergy to penicillin:

doxycycline 200 mg po once, then 100 mg po bid for 10 days

Monitoring and Follow-Up

Follow up in 3–4 days or sooner if symptoms progress despite therapy or if symptoms fail to respond to therapy.

RHINOSINUSITIS, CHRONIC[10]

Inflammation of the mucosal lining of the the paranasal sinuses lasting 12 weeks or more.

CAUSES

- Infection (bacterial anaerobes, Staphylococcus aureus, viruses)
- Structural abnormalities

HISTORY

- Prolonged nasal congestion (more than 12 weeks)
- Nasal discharge, intermittently purulent
- Postnasal drip may be present
- Early morning hoarseness may be present
- Sinus pain or pressure across the middle of the face
- Headache may be present
- Popping of ears
- Eye pain
- Halitosis
- Chronic cough
- Fatigue
- No fever
- Decreased sense of smell
- History of underlying risk factors such as allergic rhinitis, GERD, cystic fibrosis, immunodeficiency, structural abnormalities, eosinophilic nonallergic rhinitis

PHYSICAL FINDINGS

- Client appears well
- Nasal mucous membranes may appear pale and "boggy"
- Tenderness may be present over sinuses

DIFFERENTIAL DIAGNOSIS

- Allergic rhinitis
- Vasomotor rhinitis
- Nasal polyp
- Infection of upper respiratory tract
- Tumour
- Migraine headache
- Cluster headache
- Dental abscess

COMPLICATIONS

- Recurrent acute sinusitis
- Spread of infection to the intraorbital or intracranial structures

DIAGNOSTIC TESTS

None initially. Consider diagnostic tests such as sinus x-ray or computed tomography (CT) scan of sinuses if initial therapy fails; discuss these diagnostic tests with a physician.

MANAGEMENT

Goals of Treatment

- Relieve symptoms
- Identify predisposing or underlying factors
- Prevent spread of infection to other structures

Appropriate Consultation

A physician should be consulted for these patients. Specialist consult may also be necessary if anatomical abnormalities are suspected or it is not resolving.

Chronic rhinosinusitis is a complex condition which often requires a combination of topical or oral glucocorticoids, antibiotics and nasal irrigation.

Nonpharmacologic Interventions

Client Education

- Recommend increasing hydration (6–8 glasses of fluid per day)
- Recommend inhalation of steam or use of warm compresses to relieve pressure on sinuses
- Counsel client about appropriate use of medications (dosage and side effects)
- Recommend avoidance of irritants (for example, smoke) and allergens
- Recommend avoidance of diving, swimming or flying if symptoms are acute

Pharmacologic Interventions[7]

Manage current symptoms with oral antibiotics; a longer course of therapy than for acute sinusitis is usually needed (that is, 3 weeks). Repeated courses of antibiotics are not recommended:

amoxicillin/clavulanate (Clavulin), 875 mg PO bid for 21 days

or

clindamycin (Dalacin C), 300 mg PO qid for 21 days

Monitoring and Follow-Up

Follow up in 2 weeks.

Referral

Refer to a physician if symptoms do not improve after 4 weeks of continuous antibiotic therapy to rule out underlying pathology (for example, nasal polyps, deviated nasal septum, chronic allergies). Refer to a dentist if underlying dental disease is suspected.

COMMON PROBLEMS OF THE THROAT

LARYNGITIS

Laryngitis is an inflammation of the voice box (larynx) due to overuse, irritation or infection.

CAUSES

- Viral infection (common cold)
- Bacterial infection (Streptococcus)
- Chronic mouth breathing
- Overuse of voice
- Chronic sinusitis
- Excessive smoking (or exposure to second-hand smoke)
- Aspiration of caustic chemical
- Gastroesophageal reflux
- Changes due to aging (for example, muscle atrophy, bowing of cords)
- Alcohol abuse
- Long-term exposure to dust or other irritants

HISTORY

- Presence of risk factors *(see "Causes")*
- Concurrent infection of the upper respiratory tract may be present
- Hoarseness or loss of voice, abnormal-sounding voice
- Throat pain, tickle or rawness
- Aphonia (no sound is emanated from vocal folds)
- Dysphonia (a general alteration in voice quality)
- Cough
- Fever
- Malaise

PHYSICAL FINDINGS

- Temperature may be elevated
- Client appears mildly ill
- Throat may be mildly to moderately injected
- No exudate
- Lymph nodes may be enlarged

DIFFERENTIAL DIAGNOSIS

- Cancer of the throat or larynx (if condition prolonged or recurrent)
- Polyps of vocal cords
- Gastroesophageal reflux disease (GERD)

DIAGNOSTIC TESTS

None.

MANAGEMENT

Goals of Treatment

- Relieve symptoms
- Identify and remove contributing factors (for example, smoking)

Appropriate Consultation

Consult a physician immediately if client has stridor and shortness of breath.

Nonpharmacologic Interventions

- Voice rest is the mainstay of treatment (including, throat clearing)[12]
- Removal of contributing factors (for example, smoking and alcohol) is also important
- Increase humidity of room air
- Increase fluid intake if febrile
- Increase rest until any fever settles

Client Education

- Explain disease course and expected outcomes
- Counsel client about appropriate use of medications (dosage and side effects)
- Stress importance of follow-up if not resolved in 1 week

Pharmacologic Interventions

Usually none.

Monitoring and Follow-Up

Follow up in 7 days if not resolved, (sooner if symptoms worsen).

Referral

Refer to a physician if symptoms persist for longer than 2 weeks.

PHARYNGITIS (SORE THROAT)

Inflammation or infection of mucous membranes of pharynx (may also affect the palatine tonsils).

CAUSES

Infectious

- Viruses (for example, rhinovirus, adenovirus, parainfluenza, coxsackievirus, Epstein-Barr virus, herpes virus)
- Bacteria (for example, group A ß-hemolytic *Streptococcus* [most common]), *Chlamydia, Corynebacterium diphtheriae, Haemophilus influenzae, Neisseria gonorrhoeae*
- Fungi (for example, *Candida*); rare except in immunocompromised people (for example, those with HIV or AIDS)

Noninfectious

- Allergic rhinitis
- Sinusitis with postnasal drip
- Mouth breathing
- Trauma
- Gastroesophageal reflux disease
- Risk factors: contact with a person with group A streptococcal infection, crowded living quarters, immunosuppression (for example, HIV/AIDS), fatigue, smoking, excess consumption of alcohol, oral sex, diabetes mellitus or use of steroids (oral or inhaled)

HISTORY

Bacterial

- Abrupt onset of sore throat
- Pain on swallowing
- Absence of cough
- Fever or chills
- Malaise
- Skin rash may be present
- Headache
- Anorexia

Viral

- Slow, progressive onset of sore throat
- Mild malaise
- Cough
- Nasal congestion

Noninfectious

- Slow, progressive onset of sore throat
- Mild malaise
- Cough
- Persistent, recurrent
- Pain on swallowing

PHYSICAL FINDINGS

Bacterial

- Temperature elevated
- Pulse elevated
- Client appears acutely ill
- Posterior pharynx red and swollen
- Tonsils enlarged, may be asymmetric
- Purulent exudate may be present
- Tonsillar and anterior cervical nodes enlarged and tender
- Rash (scarlatiniform in group A streptococcal infection)

Viral

- Temperature may be elevated
- Posterior pharynx red and swollen
- Purulent exudate may be present
- Tonsillar and cervical nodes may be enlarged and tender
- Petechiae on palate (in mononucleosis)
- Vesicles (in herpes)

Noninfectious

- Posterior pharynx red and swollen
- Tonsillar and anterior cervical nodes may be enlarged and tender
- Exudate may be present

It is often impossible to distinguish clinically between bacterial and viral pharyngitis. See the clinical tool *"The Sore Throat Score"* to help decide whether a patient has a group A streptococcal throat infection and needs antibiotics.

THE SORE THROAT SCORE

In adults, 85–90% of sore throats are caused by viral infections.[13] In an effort to assess the probability of diagnosing Group A streptococcal pharyngitis in a patient presenting with a sore throat, a number of tools have been developed. In a primary care setting, the Sore Throat Score provides an evidenced-based clinical decision rule for all age groups.[14,15]

Step 1

Determine the client's total sore throat score by assigning points using the following criteria.

Criteria	Points
History of fever or measured temperature > 38°C	1
Absence of cough	1
Tender anterior cervical adenopathy	1
Tonsillar swelling or exudate	1
Patient's age	1
Age < 15 years	1
Age 15–44	0
Age ≥ 45	-1

Step 2

Choose the appropriate management according to the total score.

Total Score	Management
-1 to 0	No culture or antibiotics
1 to 3	If Rapid Strep test is available: • If result is negative: culture throat and await results • If result is positive: treat with antibiotics If no Rapid Strep test is available: perform culture; no antibiotics unless culture returns positive
4 to 5	Culture and consider empiric antibiotic therapy on clinical grounds until culture result available

The score is *invalid*:

– in any community in which an outbreak or epidemic of group A streptococcal pharyngitis is occurring and should *not* be applied in this type of situation,
– in populations where rheumatic fever remains a problem,
– in clients with a history of rheumatic fever or valvular heart disease or who are immunosuppressed

DIFFERENTIAL DIAGNOSIS

– Distinguish bacterial from viral infection
– Infectious mononucleosis
– Sexually transmitted infection (for chronic pharyngitis, investigate sexual practices)
– Vincent's angina (necrotic tonsillar ulcers)
– Distinguish reactive inflammation from an underlying disorder *(see "Cause")*

COMPLICATIONS

– Rheumatic fever (group A *Streptococcus* only)
– Glomerulonephritis (group A *Streptococcus* only)
– Peritonsillar abscess

DIAGNOSTIC TESTS

– Rapid Strep test if available *(see "The Score Throat Score"* for indications to swab)
– Swab the throat for culture and sensitivity when indicated *(see " The Score Throat Score")*

MANAGEMENT

Goals of Treatment

– Eradicate infection
– Prevent complications
– Prevent spread of group A *Streptococcus* to contacts

Appropriate Consultation

Consult a physician if the client has significant dysphagia or dyspnea (signaling obstruction of the upper airways) or if there is concern about an underlying pathology such as HIV.

Nonpharmacologic Interventions

– Bed rest during febrile phase
– Adequate oral intake of fluids (6–8 glasses of fluid per day)
– Avoidance of irritants (for example, smoke)
– Gargling with warm saline qid

Pharmacologic Interventions[16]

For pain and fever:

acetaminophen (Tylenol), 325 mg, 1–2 tabs PO q4h prn

or

ibuprofen (Motrin), 200 mg, 1–2 tabs q4h prn

Treat with antibiotics if streptococcal disease is suspected according to "The Sore Throat Score" *(see "The Score Throat Score")* and/or it has been confirmed by culture or Rapid Strep testing:

penicillin V potassium (Penicillin V), 300 mg PO tid or 600 mg PO bid for 10 days

For clients with penicillin allergy:

erythromycin 250 mg PO qid or 500 mg PO bid for 10 days

Do not use ampicillin or amoxicillin, because these drugs may cause a generalized red "drug rash" if infectious mononucleosis is present.

Monitoring and Follow-Up

Instruct client to return to clinic for reassessment if symptoms do not improve in 48–72 hours.

Referral

Referral may be necessary if condition is recurrent or persistent or an undiagnosed underlying pathology is suspected.

COMMON PROBLEMS OF THE MOUTH

ANGULAR CHEILITIS[17]

Cracks or lines at the corners of the mouth.

CAUSES

- Bacteria: *Staphylococcus aureus*
- Fungus: *Candida*

Predisposing Factors

- Increased moisture at corners of mouth
- Sagging face and loss of teeth (particularly back teeth) in older adults
- Fungal infection

PHYSICAL EXAMINATION

- Erythema, maceration at corners of mouth
- White coating

DIAGNOSTIC TESTS

- Swab for culture
- KOH test for candidiasis

MANAGEMENT

The key to treating angular cheilitis is to identify and treat the cause.

APHTHOUS STOMATITIS[18,19]

Ulcers and inflammation of the tissues of the mouth, including the lips, buccal mucosa, tongue, gingiva and posterior pharyngeal wall that are recurrent and painful. After mucosal breakdown, lesions become secondarily infected by mouth flora. It is less prevalent in men and chronic smokers.[20] It is the most common cause of oral ulcers, occurring in up to 30% of otherwise healthy individuals.

CAUSES

- Herpes simplex virus
- Coxsackievirus
- Oral candida

Predisposing Factors

- Immunocompromised status
- Autoimmune disease (for example, Crohn's disease)

Contributing Factors

- Allergies (coffee, chocolate, potatoes, cheese, figs, nuts, citrus fruits and gluten)
- Stress
- Exposure to sunlight
- Generalized physical debility
- Trauma
- Nutritional deficiencies (Vitamin B12, folate, iron)
- Hormones
- Medications (antihypertensives, antineoplastics, gold salts, nonsteroidal anti-inflammatories)

HISTORY

- Onset and duration of symptoms
- Previous history of the same and treatment
- Fever
- Burning or tingling before ulceration
- Pain
- Drooling
- Difficulty swallowing
- Decreased nutritional intake
- Associated respiratory or gastrointestinal symptoms
- Associated skin rash
- Nutritional deficiencies, stressors, allergies, recent mouth trauma, infections, risk factors for STIs
- Medications
- Weight loss (if severe ulcers)
- Systemic diseases
- Recent dental treatment
- Smoking or alcohol use

PHYSICAL FINDINGS

- Temperature may be increased in infectious types
- Check weight, record as baseline
- Hydration status
- Assess for lymphadenopathy
- Assess for lesions on body
- Auscultate chest
- Complete physical if systemic disease is suspected

Examine outside of lips first. Next, gently retract the lips with a tongue depressor to examine the anterior buccal mucosa and gingiva. Then gently depress the tongue. Note location, number and distribution of lesions. Also note colour(s), borders (distinct or diffuse), texture (firm or fluctuant), discharge and size of lesions.

Look for the following features:

- Erythema (herpangina)
- Vesicles (early stages of all infectious types)
- Ulcers: check distribution (confluent ulcers may appear as large, irregular white areas)
- Submandibular lymph nodes (most prominent in herpes)

See Table 1, "Features of Common Forms of Stomatitis".

Table 1 – Features of Common Forms of Stomatitis

Disease	Cause	Type of Lesions	Site	Diameter	Other Features
Herpangina or hand-foot-and-mouth disease	Coxsackievirus, echovirus, enterovirus 71	Vesicles and ulcers with erythema	Anterior pillars, posterior palate, pharynx and buccal mucosa	1–3 mm	Dysphagia, vesicles on palms of hands and soles of feet and in mouth
Herpes stomatitis	Herpes simplex virus	Vesicles and shallow ulcers (round or oval), which may be confluent	Gingiva, buccal mucosa, tongue, lips	> 5 mm	Drooling, coalescence of lesions Duration about 10 days
Aphthous stomatitis (minor or major)	Unknown	Ulcers with exudate	Buccal mucosa, lateral tongue	Minor < 10 mm Major > 10 mm	Pain, no fever Usually only one or two lesions

DIFFERENTIAL DIAGNOSIS

- Immunologic: gingival hyperplasia
- Systemic lupus erythematosus
- Erythema multiforme
- Oral cancer (suspect if lesions present more than 3–6 weeks and are unresponsive to treatment)
- Oral candidiasis
- Lichen planus
- Leukoplakia (chronic irritation)
- Hand-foot-and-mouth disease
- Herpes simplex virus
- Herpangina
- Primary HIV/AIDS infection
- Syphilis
- Vincent's stomatitis
- Trauma
- Pemphigus
- Denture stomatitis (red palate under denture)
- Mucus retention cyst (a normal-coloured, fluid-filled cyst on the inner portion of the lip). It will resolve normally by itself
- Adverse drug reaction

COMPLICATIONS

- Dehydration
- Secondary infection (for example, gangrenous stomatitis)
- Ludwig's angina

DIAGNOSTIC TESTS

- Usually none
- Vitamin B12, folate and iron if nutritional deficiencies are suspected
- CBC to rule out anemias
- Tzank smear (for herpetic stomatitis)
- Biopsy (for oral cancer)

MANAGEMENT

There are as yet no specific treatments for any of these conditions. Herpes stomatitis usually lasts 10 days. Herpangina lasts for only a few days and has few complications. Aphthous stomatitis requires no treatment.

Goals of Treatment

- Relieve symptoms
- Prevent complications

Appropriate Consultation

The disease is self-limiting, so consultation is usually unnecessary, unless there are complications.

Nonpharmacologic Interventions

Maintenance of hydration is important. Increase oral intake of fluids (that is, maintenance requirements + fluid deficits caused by fever).

Client Education

- Counsel clients about the expected duration of this illness and the signs and symptoms of dehydration
- Recommend dietary adjustments: bland, non-acidic fluids (such as milk and water); popsicles, ice cream and similar food items; avoid citrus foods such as orange juice
- Recommend local mouthwashes (1:1 hydrogen peroxide and water), especially after eating
- Warm saline rinse 4 times daily for traumatic or viral ulcers
- To prevent spread of infection, recommend avoidance of direct contact with infected individuals (for example, kissing, sharing glasses and utensils, hand contact)
- Educate clients that the herpes virus can spread even when sores are not present

Pharmacologic Interventions[7]

Antipyretic and analgesic for fever and pain:

> acetaminophen (Tylenol), 325–650 mg PO or PR q4-6h prn

A topical anesthetic containing benzocaine (for example, Anbesol) can be obtained from a retail pharmacy.

Do not treat this condition with antibiotics, as they are not indicated and are not helpful.

Herpetic lesions on the lips

If the lesions are herpetic, consult a physician who may suggest oral antiviral therapy depending on severity/recurrence. Topical antivirals such as acyclovir (for example, Zovirax) are sometimes used but must be started before lesions appear.[22]

Oral Candidiasis

Antifungal:

> nystatin oral suspension 500,000 units (5 mL) swish and swallow qid

If large (> 1 cm), persistent and painful lesions interfere with nutrition where there is no possibility of infection, consult a physician who may suggest a brief course of prednisone: 60 mg PO tapered by 5 mg/day over two weeks.[23]

Monitoring and Follow-Up

- If lesions are severe, follow up in 2–3 days
- For lesions of unknown origin, follow up in 7 days
- Have client return if lesions persist after 3 weeks despite treatment, if they are unable to eat or if they are losing weight

Referral

Refer to a physician, for lesions that are not resolving after 3 weeks.

DENTAL ABSCESS

Infection of the soft tissue surrounding tooth or gums due to infection of a tooth or the structures supporting the tooth.

CAUSES

- Progressive dental decay causing pulpitis from gram-positive anaerobes and *Bacteroides*
- Foreign body impaction around the tooth
- Predisposing factors: deep caries, poor dental hygiene, dental trauma

HISTORY

- Localized tooth pain
- Constant, deep, throbbing pain
- Pain worsens with mastication or exposure to extreme temperatures
- Tooth may be mobile
- Gingival or facial swelling (or both) may be present

PHYSICAL FINDINGS

- Fever may or may not be present
- Facial swelling may be present
- Carious tooth
- Gingival edema and erythema
- Tooth may be loose
- Localized tenderness over affected area of jaw
- Anterior cervical nodes enlarged and tender
- Localized tooth pain

DIFFERENTIAL DIAGNOSIS

- Disease of the salivary gland (for example, mumps)
- Sinusitis
- Cellulitis

COMPLICATIONS

- Cellulitis
- Recurrent abscess formation

DIAGNOSTIC TESTS

None.

MANAGEMENT

Goals of Treatment

- Relieve symptoms
- Prevent spread of infection

Appropriate Consultation

Consult a physician if a large fluctuant abscess is present, if client is acutely ill, if the infection has spread to the soft tissues of the neck or if there is no response to initial treatment in 48–72 hours.

Nonpharmacologic Interventions

Warm saline oral rinses qid.

Client Education

- Counsel client about appropriate use of medications (dosage and side effects)
- Recommend dietary modifications (liquids or soft diet)
- Recommend improvements to dental hygiene

Pharmacologic Interventions[7]

Oral antibiotics (only if lymph node involvement):

amoxicillin 500 mg PO tid for 10 days

For clients with penicillin allergy:

clindamycin (Dalacin C), 150–300 mg PO qid for 7 days

For spreading infections involving facial swelling:

amoxicillin/clavulanate (Clavulin), 875 mg (of amoxicillin) PO bid for 10 days

For clients with penicillin allergy:

clindamycin (Dalacin C), 300 mg PO qid for 7 days

Simple analgesics for mild to moderate dental pain:

ibuprofen (Motrin), 200 mg, 1–2 tabs PO q4h prn to a maximum of ibuprofen 800 mg PO tid. Ensure patient is aware this is the maximum daily dose.

or if unable to take ibuprofen:

acetaminophen (Tylenol), 325 mg 1–2 tabs PO q4-6h prn

If the patient cannot take ibuprofen and is experiencing severe pain contact a physician for a codeine-containing product:

acetaminophen with codeine (Tylenol #3), 1–2 tabs PO q4-6h prn

Monitoring and Follow-Up

Follow up in 48–72 hours. If unresolved, consult with a physician who may suggest changes to the antimicrobial therapy such as the addition of metronidazole.

Referral

Refer to a dentist for definitive therapy.

DENTAL DECAY[24]

Dental decay is a multifactorial disease. In general, bacterial colonies (dental plaque) convert the sugar in fermentable carbohydrates into an acid that demineralizes the dental enamel. When demineralization is not occurring, protective factors such as from the saliva or fluoride exposures result in remineralization of the enamel. Decay occurs when the balance tilts toward demineralization exceeding remineralization over an extended period of time. In the early stages of decay, the enamel takes on a dull white appearance; however the decay can still be halted or reversed at this stage. It is usually asymptomatic. If demineralization is allowed to continue, eventually the enamel breaks down and cavitation occurs, at which time the process becomes less reversible.

As decay progresses into the dentine, the tooth becomes more sensitive to sweet and cold. When it approaches the pulp of the tooth, the pulp becomes hyperaemic (engorged), reacting more strongly to temperature change and other stimuli. Once bacteria have entered the pulp the process of a dental abscess begins. With destruction of the pulp, pressure builds at the apex (root end) and the tooth throbs constantly, becoming worse with hot temperatures and pressure.

CAUSES

– Bacteria, carbohydrate sugar and saliva in combination

HISTORY

For explanation of the progression of dental decay, its pathology, signs and symptoms *see Table 2, "Pathology, signs and Symptoms of Dental decay"*.

– Sensitivity of tooth/teeth to sweets, cold or hot food and liquids and pressure
– History of dental caries, abscess(es)
– Pain, particularly when eating
– Dental care routine
– Recent dental treatments

Table 2 – Pathology, Signs and Symptoms of Dental Decay (along its course of progression)

Tooth or Soft Tissue Condition	Pathology / Reversibility	Explanation	Discomfort – Presenting Symptoms
Asymptomatic (Normal – no decay)	None		Normal – slight sensitivity to hot and cold
Asymptomatic (Normal – minor decay or trauma)	Minor decay or trauma Reversible	Remaining hard tooth structure insulates pulp tissue.	Normal (as above) No long-lasting pain
Mild pulpal involvement - cavity - deep filling - trauma - recent dental treatment	Hypaemia of pulpal tissue Reversible	Cold contracts hard tissue, putting pressure on hyperaemic tissue; sweet causes osmotic ion movement.	Increased sensitivity to cold and sweet. Occasional sharp pain to insult, but short lasting.
Severe pulpal involvement - deep decay - deep filling - recent severe trauma	Necrosis of pulp tissue Irreversible	Heat expands gas produced by necrotic tissue.	Increased sensitivity to heat. Sensitivity to percussion (tapping, biting). Spontaneous pain, throbbing, moderate duration.
Involvement of soft tissue surrounding tip of root	Chronic inflammatory response outside of tooth Irreversible	Soft tissue supporting tooth is stretched, swelling confined by bone.	Very sensitive to percussion. Tooth is extruded. Mobility of tooth. Long-lasting pain.
Expansion of apical pathology beyond nearest bony cortex	"Gum boil" or facial swelling (depends on length of root) Irreversible	Chronic suppuration – body cannot get to source of problem. If there is a draining fistula, there is no intrabony pressure, so no pain.	Pain decreases but an obvious sign is present: gum boil or facial swelling. Oral soft tissue may look normal. Pain originates from stretched soft tissue of face. Trismus of musculature (lockjaw) may limit opening of the mouth.

PHYSICAL EXAMINATION

To assist with staging the progression of dental decay *see Table 2, "Pathology, signs and Symptoms of Dental decay"*. Assess for:

– General appearance
– Pain
– Temperature (client should not be febrile, unless an abscess is present)
– Draining lesion
– Oral soft tissue colour, swelling
– Sensitivity of affected teeth to percussion (tapping)
– Mobility of tooth
– Pits or caries in teeth
– Facial swelling or gum boil
– Ability to open mouth

DIFFERENTIAL DIAGNOSIS

– Dental abscess

COMPLICATIONS

– Dental abscess
– Chronic discomfort in the mouth
– Exposure of the bone in the socket after a lower back tooth has been removed (dry socket)
– Fractured tooth

MANAGEMENT

Appropriate Consultation

A physician should be consulted if:

– the client has facial swelling
– the client is immunocompromised (for example, has diabetes mellitus)
– the client has pain not relieved by treatment
– the condition is not resolving after one course of treatment
– the client is febrile
– the client has difficulty opening mouth

Nonpharmacologic Interventions

Encourage regular dental hygiene.

Mild pulpal involvement:

Allow time for healing if there has been recent dental treatment.

Pharmacologic Interventions

Refer to *Table 2, "Pathology, signs and Symptoms of Dental decay"* for presenting symptoms.

Mild pulpal involvement:

– Antibiotics not necessary

Simple analgesics for mild to moderate dental pain:

ibuprofen (Motrin), 200 mg, 1–2 tabs PO q4h prn

or

acetaminophen (Tylenol), 325 mg 1–2 tabs PO q4-6h prn

For moderately severe dental pain, codeine may be required:

acetaminophen with codeine (Tylenol #3), 1–2 tabs PO q4-6h prn

Severe pulpal involvement:

– Antibiotic (lower dose) (for example, Penicillin VK [Pen V] 300 mg qid)
– Analgesic as required

Involvement of soft tissue surrounding tip of root:

Oral antibiotics and analgesia. Antibiotics as follows:

penicillin V potassium (Penicillin V) 300–600 mg PO qid for 7 days

Metronidazole should be added to penicillin if infection spreads or systemic symptoms present:

metronidazole (Flagyl), 500 mg po bid for 7 days

For clients with penicillin allergy or in areas of significant penicillin resistance:

clindamycin (Dalacin C), 150–300 mg PO qid for 7 days

Expansion of apical pathology beyond nearest bony cortex:

– None if draining intraorally
– With facial swelling, oral/IV antibiotic, and analgesics if required. Consult the physician if intravenous antibiotics are deemed necessary. Otherwise, oral antibiotics as used for involvement of soft tissue surrounding tip of root can be used

Monitoring and Follow-up

– Clients with facial swelling should be seen daily until it resolves
– Instruct client to return for reassessment immediately if lesion develops, if pain increases or if fever develops

Referral

If a client presents with severe facial swelling or has difficulty opening their mouth, referral to a physician may be warranted. This decision should be made in consultation with a physician.

Referral to a dentist is warranted in the following situations for treatment:

– Asymptomatic with minor decay or trauma for dental restorations
– Mild pulpal involvement for temporary filling if cavity present
– Severe pulpal involvement for removal of necrotic tissue in tooth by extraction or root canal treatment (temporary or permanent filling will not work and may increase pain)

– Involvement of soft tissue surrounding tip of root for drainage of area by extraction or root canal treatment
– When an expansion of apical pathology beyond nearest bony cortex requires an extraction of tooth, possibly with curettage. If intraoral gum boil only, immediate treatment is often not necessary

DISCOLOURED (NON-VITAL) PERMANENT TOOTH

See the section *"Discoloured (non-vital) Permanent Tooth"* in the chapter *"Ears, Nose, Throat and Mouth"* in the pediatric clinical practice guidelines for detailed information on the clinical presentation and treatment of a discoloured permanent tooth. Treatment is the same for children and adults.

GINGIVITIS

Gingivitis is inflammation of the unattached gingival tissue around a tooth.

HISTORY AND PHYSICAL FINDINGS

The tissues are red in colour, slightly swollen, and bleed with slight manipulation (such as toothbrushing).

MANAGEMENT

Nonpharmacologic Interventions

Gingivitis is reversible with thorough brushing and flossing. The client should be advised that the tissues will bleed upon brushing for the first few days, but with thorough self-care, this bleeding will stop and the tissues will return to health in a few days.

MIGRATORY GLOSSITIS (GEOGRAPHIC TONGUE)

Tongue demonstrates several smooth, red areas outlined by elevated gray margins of epithelial tissue. Migratory glossitis is not a pathological condition and no treatment is indicated.

CAUSES

Unknown.

MANAGEMENT

Nonpharmacologic Interventions

Reassure client.

PERICORONITIS

Pericoronitis is infection and inflammation of the gingival tissues around a partially erupted tooth. It is most common around a mandibular wisdom tooth.

CAUSES

– Bacterial (often spirochete) infection

HISTORY

– Newly erupting tooth
– Smoking is often a factor

PHYSICAL FINDINGS

– Redness and swelling of soft tissues surrounding a partially erupted tooth
– The opposing tooth may be occluding on the swollen tissues around the affected tooth
– Possible swelling of the submandibular lymph nodes
– There might be limited opening of the mandible

COMPLICATIONS

– More generalized infection

MANAGEMENT

Goals of Treatment

– Prevent broader infection of the area
– Reduce discomfort

Appropriate Consultation

Consultation with a physician is not normally warranted, unless complications arise.

Nonpharmacologic Interventions

– Warm saline rinses, four times daily until condition resolves
– Avoid spicy foods
– Avoid smoking

Client Education

– Condition will usually resolve itself
– Stress meticulous oral hygiene of other teeth

Pharmacologic Interventions

Pericoronal infection (pericoronitis) does not require antibiotics, unless there is lymph node involvement and facial swelling, or restricted opening.

If needed, oral antibiotics:

amoxicillin 250–500 mg po tid for 7 days

Metronidazole should be added to penicillin if infection spreads or systemic symptoms present:

metronidazole (Flagyl), 500 mg po bid x 7 days

For clients with penicillin allergy or in areas of significant penicillin resistance:

clindamycin (Dalacin C), 150–300 mg PO qid for 7 days

Simple analgesics for mild to moderate dental pain:

ibuprofen (Motrin), 200 mg, 1–2 tabs PO q4h prn

or

acetaminophen (Tylenol), 325 mg, 1–2 tabs PO q4-6h prn

For moderately severe dental pain, codeine may be required:

acetaminophen with codeine (Tylenol #3), 1–2 tabs PO q4-6h prn

Referral

Refer to a dentist for follow-up.

PERIODONTITIS

Periodontitis is inflammation of the periodontal tissues around the teeth, and subsequent loss of supporting structures (periodontal ligament and alveolar bone). In the adult a common form of periodontitis will manifest with a slow progression of tissue destruction which may result in a loose tooth or the loss of teeth.

CAUSES

- Inflammation of the gingiva (gingivitis)
- Build-up of calculus (tartar)

Periodontitis is influenced by general health issues such as diabetes, and local irritants such as smoking.

HISTORY

- Medical conditions such as diabetes
- Smoking is often a factor
- Rate of build-up of calculus

PHYSICAL FINDINGS

- There may not be easily detectible signs of periodontitis (calculus might be subgingival; bone loss not evident)
- Heavy calculus accumulations
- Usually no discomfort – patient might complain of “itchy” or “uncomfortable” feeling in gums
- Mouth odour
- In advanced stages, teeth may be mobile

COMPLICATIONS

- Progression of periodontal disease will lead to tooth loss
- There is growing evidence of links between periodontal disease and other medical conditions such as cardiovascular disease, respiratory diseases and diabetes

MANAGEMENT

- Thorough, regular oral hygiene
- Regular professional care by dentists, dental hygienists and/or dental therapists

Goals of Treatment

- Prevent or slow down the loss of supporting tissues
- Reduce the inflammation

Nonpharmacologic Interventions

- Thorough brushing and flossing on a regular basis
- Avoid smoking

Client Education

- Need for thorough and regular oral hygiene
- Need for regular professional care (with frequency based on individual needs)

Referral

Refer to a dental professional for follow-up.

TOOTHACHE

See *“Toothache”* in *“Ears, Nose, Throat and Mouth”*, in the pediatric clinical practice guidelines for detailed information on the clinical presentation and treatment of a toothache. Treatment is the same for children and adults.

XEROSTOMIA (DRY MOUTH)[25,26]

Everyone's mouth is dry now and then, but for many adults, dry mouth (xerostomia) is a chronic condition that leaves the mouth dry, sore and sticky. Some patients have difficulties eating, swallowing, talking or wearing dentures (due to loss of suction). They may be vulnerable to sores and yeast infections, and their teeth are more prone to decay.

CAUSES

- Side effect of medications such as tricyclic antidepressants, benztropine and other anticholinergics, benzodiazepines, isotretinoin
- Medical conditions – diabetes, Sjogren's syndrome, Parkinson's disease
- Therapeutic radiation or chemotherapy
- Alcohol
- Head injury

HISTORY

- Medications
- Other medical conditions such as diabetes, Parkinson's disease
- Smoking and alcohol use

PHYSICAL FINDINGS

- Oral mucosa and tongue very dry
- Loose dentures
- Candidiasis
- Alteration in speech

DIFFERENTIAL DIAGNOSIS

- Chronic xerostomia
- Short-term reaction to temporary medications

COMPLICATIONS

- Increased dental decay
- Sores
- Fungal infections
- Nutritional deficiencies (difficulty eating certain foods)

MANAGEMENT

Goals of Treatment

- Prevent dental decay, fungal infections
- Improve comfort

Nonpharmacologic Interventions

- Increase fluid intake, particularly water or carbonated water
- Avoid acidic fluids – pop, energy drinks
- Avoid drinks with caffeine – coffee, tea, some sodas
- Encourage use of a humidifier
- Sugar free gum – sweetened with xylitol
- Xylitol sweetened candies
- Avoid spicy foods
- Avoid smoking and alcohol

Client Education

- Discuss causes of dry mouth
- Stress fluid intake
- Stress oral hygiene
- Share interventions above to help decrease xerostomia

Referral

- Refer to a physician for review of medications
- Refer to a dentist for monitoring caries and oral health

EMERGENCY PROBLEMS OF THE NOSE, THROAT AND MOUTH

AVULSED TOOTH

See the section *"Avulsed Tooth"* in the chapter *"Ears, Nose, Throat and Mouth,"* in the pediatric clinical practice guidelines for detailed information on the clinical presentation and treatment of an avulsed tooth. Treatment is the same for children and adults.

FRACTURED TOOTH

See the section *"Fractured Tooth"* in the chapter *"Ears, Nose, Throat and Mouth,"* in the pediatric clinical practice guidelines for detailed information on the clinical presentation and treatment of a fractured tooth. Treatment is the same for children and adults.

MASTOIDITIS

Suppurative (bacterial) inflammation/infection of mastoid antrum and air cells. Can be acute or chronic.

CAUSES

- Acute mastoiditis is a rare complication of acute otitis media
- Chronic mastoiditis is more commonly associated with cholesteatoma (cyst of the middle ear) or chronic suppurative otitis media (tympanic perforation with chronic drainage)
- Most common organisms: *Haemophilus influenzae*, group A Streptococcus, *Streptococcus pneumoniae*

Risk Factors

- Recurrent otitis
- Cholesteatoma
- Immunocompromised status

HISTORY

- Ear pain
- Nonresolving otitis media
- Spiking fever
- Tinnitus
- Otorrhea if ear drum is perforated

PHYSICAL FINDINGS

- Temperature moderately to severely elevated
- Client appears moderately ill
- Hearing loss
- Posterior auricular swelling and erythema
- Pinna may be displaced anteriorly if edema severe
- Manipulation of pinna and otoscopic exam of the ear causes acute pain
- Purulent drainage if tympanic membrane ruptured
- Posterior auricular warmth
- Tenderness over mastoid process
- Anterior cervical and peri-auricular nodes enlarged and tender

DIFFERENTIAL DIAGNOSIS

- Severe otitis externa
- Posterior auricular cellulitis
- Benign or malignant neoplasm
- Infection of deep neck space (Ludwig's angina)

COMPLICATIONS

- Residual hearing loss
- Meningitis
- Intracranial abscess
- Subperiosteal abscess

DIAGNOSTIC TESTS

Swab for culture and sensitivity if ear is draining.

MANAGEMENT

Goals of Treatment

- Relieve pain and swelling
- Prevent spread of infection

Appropriate Consultation

Consult a physician concerning intravenous (IV) antibiotic therapy.

Adjuvant Therapy

Start IV therapy with normal saline. Adjust rate according to state of hydration.

Pharmacologic Interventions

Consult a physician for prescription of IV antibiotics. Polymicrobial coverage is necessary (for example, cefuroxime [Zinacef]). Analgesics for pain and fever:

acetaminophen (Tylenol) , 325 or 500 mg, 1–2 tabs PO q4-6h

Referral

Medevac to hospital as soon as possible; client will need an urgent ENT consultation. Client may need several days of IV drug therapy and possibly surgery.

ORAL TRAUMA

With trauma, a tooth may fracture, become displaced or become non-vital (and abscess) or oral mucosa may be damaged or ulcerated.

MANAGEMENT

Nonpharmacologic Interventions

– Warm saline rinse 4 times daily for traumatic ulcers

Referral

Any problems resulting from trauma should be referred to a dentist for monitoring and/or treatment.

PERITONSILLAR ABSCESS

Cellulitis of the space behind the tonsillar capsule extending onto the soft palate, leading to an abscess. It is most common in 15–30 year olds. It is considered moderate to severe if the patient has any of the following symptoms: appears acutely ill, drooling, difficulty swallowing, difficulty breathing and/or inability to open mouth. Otherwise it is considered mild to moderate.

CAUSES

Bacterial infection, usually related to group A *Streptococcus (GAS)* (50%), *S. pyogenes, S. aureus, H. influenza*.

HISTORY

– Recent episode of pharyngitis
– Gradually increasing unilateral ear and throat pain
– Fever
– Malaise
– Dysphagia (difficulty swallowing)
– Dysphonia
– Drooling
– Trismus (difficulty opening mouth)

PHYSICAL FINDINGS

– Fever
– Heart rate increased
– Client may appear acutely ill or distressed
– Diaphoretic; flushed if feverish
– Affected tonsil grossly swollen medially and reddened
– Tonsil may displace uvula and soft palate to the opposite side of pharynx
– Swelling and redness of the soft palate
– Trismus (difficulty opening mouth)
– Increased salivation
– Dysphonia with (“hot potato” voice)
– Unilateral referred ear pain
– Tonsillar/cervical lymph nodes enlarged and very tender
– Fluctuance may be felt on affected side of palate

DIFFERENTIAL DIAGNOSIS

– Epiglottitis
– Gonococcal pharyngitis

COMPLICATIONS

– Obstruction of the airways
– Sepsis

DIAGNOSTIC TESTS

Swab any exudate for culture and sensitivity.

MANAGEMENT OF MILD-TO-MODERATE PERITONSILLAR ABSCESS

Treat on an outpatient basis.

Goals of Treatment

– Relieve symptoms
– Prevent complications

Nonpharmacologic Interventions

Client Education

– Advise client to return immediately if pain becomes worse or if drooling, difficulty swallowing, difficulty breathing or inability to open mouth develops
– Recommend increased fluid intake
– Recommend increased rest until fever settles
– Recommend frequent gargling with warm saline for 48 hours

Pharmacologic Interventions

Antibiotics:

penicillin V potassium (Penicillin V), 300 mg PO qid or 600 mg bid for 10 days

For clients with penicillin allergy:

clindamycin (Dalacin C), 300 mg PO tid for 10 days

Analgesics for pain and fever:

acetaminophen (Tylenol), 325 mg, 1–2 tabs PO q4h prn

or

ibuprofen (Motrin), 200 mg, 1–2 tabs PO q4h prn

Monitoring and Follow-Up

Follow up in 24 hours. If no improvement, consult with a physician. Needle aspiration, performed by a physician, may be required.

MANAGEMENT OF MODERATE-TO-SEVERE PERITONSILLAR ABSCESS

Client appears acutely ill and has difficulty swallowing.

Goals of Treatment

- Relieve symptoms
- Prevent complications

Appropriate Consultation

Consult a physician if the abscess is significant in size and the client appears acutely ill; immediate referral to hospital and examination by an ear, nose and throat (ENT) specialist are in order.

Adjuvant Therapy

Start IV therapy with normal saline; adjust rate according to age and state of hydration.

Nonpharmacologic Interventions

- Bed rest
- Give sips of cold liquids only
- Give nothing by mouth if drooling

Pharmacologic Interventions

Consult with a physician concerning choices for IV antibiotic treatment. Clindamycin (Dalacin) IV is often the drug of choice. In addition, one or two doses of dexamethasone IV can be used in conjunction with IV antibiotics.

Monitoring and Follow-Up

Monitor client to ensure adequate airway is maintained.

Referral

Medevac to hospital; client requires IV antibiotics and aspiration or surgical incision to drain abscess.

POSTERIOR EPISTAXIS

Source of bleeding appears to be from the posterior portion of the nose.

CAUSES

- Idiopathic (cause unknown)
- Hypertension
- Vascular abnormalities (hereditary hemorrhagic telangiectasia)
- Trauma: deviation or perforation of the septum
- Infection (for example, chronic sinusitis)
- Neoplasm (rare)

HISTORY

- Sudden onset of brisk, bright bleeding from nose
- May be unilateral or bilateral
- Blood running down back of throat
- May be a history of hematemesis if client has swallowed a large quantity of blood
- History of easy bruising, bleeding elsewhere (for example, melena, heavy menses), family history of bleeding tendencies, use of anticoagulants, use of acetylsalicylic acid (ASA) products

PHYSICAL FINDINGS

- Heart rate elevated
- Blood pressure may be reduced if loss of blood is significant
- Client appears anxious
- Client may be pale, sweaty if loss of blood is significant
- Bright red bleeding from nares (unilateral or bilateral)
- Bleeding site not visible
- Blood observed in pharynx

DIFFERENTIAL DIAGNOSIS

- Upper gastrointestinal bleed
- Post-tonsillectomy bleed
- Perforation of the septum

COMPLICATIONS

– Hypotension or shock (hypovolemic)
– Anemia, if bleeds are intermittent and frequent

DIAGNOSTIC TESTS

None.

MANAGEMENT

Goals of Treatment

– Stop bleeding
– Maintain circulating blood volume

Appropriate Consultation

Consult a physician if initial management fails to control bleeding, client is not stable or there is significant potential of underlying pathology.

Adjuvant Therapy

– Resuscitate patient as required
– Start IV therapy with normal saline or Ringer's lactate solution; adjust IV rate according to pulse, blood pressure and rate of bleeding

Nonpharmacologic Interventions

– Keep client at rest, sitting in most comfortable position for patient
– Apply pressure to the nose
– Insert a posterior nasal pack; use a posterior nasal pack balloon system if available; alternatively use a Foley catheter

Procedure for Foley catheter system:

1. Place a 12–16 French catheter with a 30-cc balloon into the nose along the floor of the nasopharynx, until the tip is visible in the posterior pharynx.
2. Slowly inflate the balloon with 15 mL of sterile water, pull it anteriorly until it firmly sets against the posterior choanae.
3. Maintain catheter traction and stretch slightly.
4. Insert an anterior nasal pack next (½ x 72 inch [1.25 x 180 cm] ribbon gauze impregnated with petroleum jelly).
5. Place an umbilical cord clamp across the nostril against the anterior pack so that the elasticity of the catheter compresses the balloon against the anterior pack.
6. Protect facial skin from clamp by padding with 2 x 2 inch (5 x 5 cm) gauze.
7. Drape rest of catheter over ear on same side and tape in place.

Bilateral packing is sometimes required to achieve adequate compression. The bleeding should stop after the nasal packs are in place.

Monitoring and Follow-Up

Monitor vital signs and loss of blood closely. Remove packs and balloons in 24–36 hours. There is a possibility that bleeding may continue or restart.

Referral

Medevac to hospital if bleeding does not stop, if hypovolemia is evident (hypotension, tachycardia) or if significant underlying pathology is suspected.

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CHAPTER 11 – CARDIOVASCULAR SYSTEM

First Nations and Inuit Health Branch (FNIHB) Pediatric Clinical Practice Guidelines for Nurses in Primary Care.
The content of this chapter has been revised September 2011.

Table of Contents

INTRODUCTION

Cardiovascular disease is uncommon in childhood. The major problems seen include congenital heart disease (usually abnormalities of the great vessels, hypoplastic heart, pulmonary or aortic atresia and tetralogy of Fallot), cardiac failure, rheumatic fever carditis and myocarditis.

Functional or innocent heart murmurs are common.

Congestive heart failure at birth is rare and usually suggests severe valvular deformities.

Symptoms of ventricular septal defect, including heart failure, usually occur at approximately 6 weeks of age.

For more information on the history and physical examination of the cardiovascular system in older children and adolescents, *see the chapter "Cardiovascular System" in the adult clinical practice guidelines*.

ASSESSMENT OF THE CARDIOVASCULAR SYSTEM

Symptoms of cardiovascular disease vary with the age of the child.

Ask about:

- Rapid or noisy breathing
- Cough
- Cyanosis
- Sleeping patterns
- Exercise tolerance: indicated in a young child by ability to feed and in an older child by ability to keep up with peers during play

IN INFANTS

CYANOSIS

- An abnormality of oxygen transport related to heart, lungs or blood or inadequate oxygenation of blood due to mixing of venous and arterial blood. Transport problems include impairment of the oxygen-carrying capacity of hemoglobin, as for example, in carbon monoxide poisoning, and hypoxemia secondary to ventilation/perfusion mismatches as for example in pneumonia
- Causes bluish discolouration of mucous membranes, nail beds and skin, is a significant clinical finding and is related to inadequate oxygenation of arterial blood
- May be transient (related to increased oxygen demand by tissues, for example, during feeding in infants or during play in toddlers) or permanent from birth

EXERCISE INTOLERANCE

- Eats slowly or poorly
- Tires easily during feeding and with poor weight gain
- Cyanosis appears with feeding (exertional)
- Often described by parents or caregiver as a "good baby": always quiet, sleeps a lot, parents may find baby less energetic compared to siblings at same age

DIFFICULTY BREATHING

- Tachypnea
- Chest retractions
- Nasal flaring
- Anxious appearance
- Grunting

EXCESSIVE PERSPIRATION

- Infant's head described as "always wet"
- Infant perspires freely and easily, especially with excretion and feeding

SLOW GROWTH

- Child usually exhibits slow weight gain, relative to height gain; difficulty in feeding may contribute to this problem
- Metabolic demands increased

RESPIRATORY INFECTIONS

- More common with congestive heart failure
- More severe with increased pulmonary flow

IN CHILDREN

- Slow growth
- Respiratory infections
- Chest pain
- Palpitations
- Dizzy spells or blackouts
- Exercise intolerance
- Squatting with cyanotic episodes ("tetralogy spells")

MEDICAL HISTORY (SPECIFIC TO CARDIOVASCULAR SYSTEM)

- Prematurity (associated with a higher prevalence of congenital cardiac malformation)
- History of illnesses related to heart disease (for example, strep throat)
- "Flu-like" illness
- Joint pains or swelling
- Down syndrome (associated with a higher prevalence of congenital heart disease)

PHYSICAL FINDINGS

An examination of the cardiovascular system involves more than just examining the heart. The examination generally covers two systems: the central cardiovascular system (head, neck and precordium [anterior chest]) and the peripheral vascular system (extremities). Examination of the cardiovascular system must also include a full assessment of the lungs and neuromental status (for signs of confusion, irritability or stupor).

VITAL SIGNS

- Heart rate
- Respiratory rate
- Blood pressure (in both an upper and a lower limb, if possible)
- Temperature (may be elevated with myocarditis or acute rheumatic fever)
- Cardiovascular problems may present as failure to thrive (weight and height below specified percentiles for age) or as a sharp decline in the growth curve across a major percentile line, therefore always document height and weight for all well baby and child examinations

INSPECTION

- Respiratory distress
- Cyanosis: central and peripheral
- Hands and feet: cyanosis, clubbing
- Precordium: visible pulsations
- Edema (hands, feet, sacrum)

PALPATION

- Apical beat is located at fourth intercostal space, lateral to the mid-clavicular line in infants, and at fifth intercostal space, lateral to the mid-clavicular line in older children
- Brief, localized apical tap is normal
- Apical beat may be laterally displaced, which indicates cardiomegaly
- Thrills or heaves may be palpable through chest wall; check supraclavicular area for thrills (in children with a thin chest wall, normal heart movements can be easily palpated and should not be confused with true thrills and heaves)
- Hepatomegaly
- Check for presence, rate, rhythm, amplitude and equivalence of peripheral pulses, especially femoral pulses (which are bounding in patent ductus arteriosus, absent in coarctation of aorta)
- Check for synchrony of radial and femoral pulses
- Capillary refill (normal < 3 seconds)
- Edema: pitting (rated 0 to 4) and level (how far up the feet and legs the edema extends); sacral edema
- Skin: temperature, turgor

AUSCULTATION

- S_1 and S_2 heart sounds
- Physiologic splitting of S_2 heart sound
- Added heart sounds (S_3 and S_4): determine their location and relation to respiration
- Murmurs: determine location (where murmurs are best heard), radiation, their timing in cardiac cycle, intensity, grade *(see Table 1, "Characteristics of Heart Murmurs of Various Grades")* and quality
- Bruits: may occur in carotid arteries, abdominal aorta, renal arteries, iliac arteries, femoral arteries
- Crackles in lungs: may indicate heart failure (in infants and children, this usually occurs as a late sign)

Table 1 – Characteristics of Heart Murmurs of Various Grades

Grade	Characteristics
I	Very quiet, barely audible
II	Quiet but audible
III	Easily heard
IV	Thrill can be felt, murmur is easily heard
V	Thrill can be felt and loud murmur can be heard with stethoscope placed lightly on chest
VI	Thrill can be felt and very loud murmur can be heard with stethoscope held off the chest wall

COMMON PROBLEMS OF THE CARDIOVASCULAR SYSTEM

HEART MURMURS

Most murmurs are innocent flow murmurs, which are present in up to 50% of children; *see "Innocent Heart Murmur."*

A heart murmur may signify congenital anatomic, infectious or inflammatory damage to valves and outlets of the four chambers of the heart.

PHYSICAL FINDINGS: AUSCULTATION

Auscultation helps to distinguish significant murmurs from innocent murmurs.

Murmurs must be recognized in relation to other physiologic and pathologic sounds of the cardiac cycle.

- The S_1 sound is caused by the closure of the mitral and tricuspid valves, which usually occurs simultaneously. The S_1 sound is best heard at the cardiac apex
- The S_2 sound occurs with the closure of the aortic and pulmonary valves. Because the closure of these two valves is somewhat asynchronous, what is known as the S_2 sound actually consists of two sounds. The separation of the two component sounds is often difficult to detect in young children, although it is more pronounced during inspiration. Wide separation of the S_2 sound is often a significant pathologic finding. The S_2 sound is best heard in the second and third left intercostal spaces
- An S_3 sound may occur after the second heart sound. This may be found in healthy children. It is a sign of heart failure in a symptomatic child. The S_3 sound is best heard when listening at the apex of the heart (in the fourth and fifth intercostal spaces); a left side-lying position may accentuate the sound. Use the bell part of the stethoscope
- Ejection "clicks" may be present in certain conditions; they are always abnormal

If a murmur is present, several characteristics should be determined.

Timing within Cardiac Cycle

- Systolic ejection murmurs occur after the first sound. They are caused by turbulence in the blood as it leaves the heart
- Pansystolic murmurs begin with the first heart sound and end with the second. They most often occur in association with ventricular septal defects
- Diastolic murmurs begin with the second heart sound. They are always abnormal

Shape or Contour

- Qualifies the intensity over time: murmurs can be crescendo, decrescendo, or crescendo-decrescendo

Location on the Thorax

There are four general auscultatory areas:

- *Aortic:* left ventricular outflow murmur (usually ejection)
- *Pulmonary:* right ventricular outflow murmur, patent ductus arteriosus
- *Tricuspid:* tricuspid murmurs increase on inspiration; ventricular septal defects are heard best in this area
- *Mitral:* murmur at the cardiac apex

Radiation

Radiation of the murmur to the back, sides and neck should be carefully auscultated. Radiation of the murmur may give important diagnostic clues (for example, aortic stenosis radiates to the neck).

Intensity of Murmur

- Intensity expressed as a fraction of VI (for example, I/VI, II/VI), where a very loud murmur = V/VI or VI/VI, a loud murmur = III/VI or IV/VI, and a soft murmur = I/VI or II/VI *(see Table 1, "Characteristics of Heart Murmurs of Various Grades")*
- Intensity (loudness) does not necessarily correlate with the severity of the condition. Soft murmurs may be dangerous, whereas loud murmurs are not necessarily so. A murmur associated with a thrill has an intensity of at least IV/VI
- Intensity may also increase with increased blood flow, as with exercise

Pitch

- Can be low, medium or high and is determined by whether it can be auscultated best with the bell or the diaphragm of a stethoscope

Quality

- Blowing
- Harsh
- Musical
- Rumbling
- Clanging

INNOCENT HEART MURMUR

Heart murmur that occurs in the absence of anatomic or physiologic abnormalities of the heart and therefore has no clinical significance. Such murmurs occur in 50–80% of children.

TYPES OF INNOCENT HEART MURMURS

Still's murmur – vibratory, systolic ejection murmur (SEM), lower left sternal border (LLSB) or apex; ages 3 to 6 years.

Venous hum – infraclavicular hum, continuous, heard on right side more than left side; ages 3 to 6 years.

Peripheral pulmonic stenosis – pulmonic area, systolic, low pitched, radiates to axilla and back, seen in neonates; disappears usually by 3 to 6 months of age.

Pulmonary ejection – soft, blowing, upper left sternal border, systolic ejection murmur (SEM).

PATHOPHYSIOLOGY

Most innocent heart murmurs are produced by the forward flow of blood, which creates turbulence in the chambers of the heart or the great vessels. These murmurs are often more pronounced in high-output states, such as during a fever. Because the intensity of the murmur parallels the ejection velocity of blood from the ventricles, innocent murmurs usually occur during early to mid-systole, are short in duration, have a crescendo-decrescendo contour (especially an ejection murmur), are less than 3/6 in intensity and are never diastolic.

CLINICAL FEATURES

Innocent heart murmurs are asymptomatic and are usually found on routine physical examination.

DIAGNOSTIC TESTS

- Electrocardiogram (ECG)
- Echocardiography (only as ordered by a physician)

MANAGEMENT

Reassure the parents or caregiver that no immediate treatment is necessary.

Referral

Refer the asymptomatic child electively to a physician for assessment when a murmur is found.

EMERGENCY PROBLEMS OF THE CARDIOVASCULAR SYSTEM

CARDIAC FAILURE

The inability of the heart to pump blood commensurate with the body's needs. The symptoms and signs correlate with the degree of failure.

CAUSES

- Congenital abnormality of cardiac structures
- Inflammatory (for example, rheumatic fever)
- Infectious (for example, viral cardiomyopathy, subacute bacterial endocarditis)
- Severe anemia (that is, hemoglobin < 40 g/L)
- Other high-output states (for example, thyrotoxicosis, arteriovenous malformation)
- Extracardiac disease (for example, chronic pulmonary disease, pulmonary hypertension)

HISTORY

The history varies according to the child's age.

- Difficulty with feeding
- Shortness of breath
- Excessive sweating
- Poor weight gain
- Anxious appearance

PHYSICAL FINDINGS

- Tachycardia
- Tachypnea
- Blood pressure (assessed in both arms) usually normal but may be reduced (if so, this is cause for concern, as it may indicate cardiogenic shock)
- Temperature: if higher than normal, consider inflammatory or infectious cause
- Irritable
- Anxious
- Fontanel full
- Nostrils flared
- Cyanosis
- Peripheral swelling (in older children)
- Increased jugular venous distention
- Displaced, diffuse apical impulse (cardiomegaly)
- Heave or thrill
- Gallop rhythm (with extra S_3 heart sound)
- Increased murmurs
- Crackles in lung fields
- Hepatomegaly
- Diminished peripheral pulses

DIFFERENTIAL DIAGNOSIS

- Respiratory disease (for example, bronchiolitis or pneumonia)
- Metabolic abnormality (for example, hypoglycemia; poisoning, as with salicylates) also consider hyperglycemia with ketosis, head injuries
- Sepsis including meningitis

COMPLICATIONS

- Decreased cardiac output (shock)
- Death

DIAGNOSTIC TESTS

- Pulse oximetry

MANAGEMENT

Goals of Treatment

- Improve hemodynamic function
- Prevent complications

Appropriate Consultation

Consult with a physician regarding emergency treatment.

Nonpharmacologic Interventions

- Nurse the child in head-elevated position (do not allow neck to become kinked)
- Restrict oral fluids to no more than the quantity required to maintain hydration *(see chapter "Fluid Management")*

Adjuvant Therapy

- Start IV therapy with normal saline to keep vein open (unless this would stress the child too much)
- Give oxygen 6–10 L/min or more by non-rebreather mask.[1] Titrate to keep oxygen saturations > 97%[2]

Pharmacologic Interventions

Drugs used to treat heart failure in children are to be ordered by a physician.

- Diuretics to decrease volume:
  furosemide (Lasix), 1 mg/kg IV stat (may be given PO if IV access not available)
- ACE inhibitors may be prescribed by a physician for afterload reduction
- Digoxin may be used in some cases to increase contractility

Monitoring and Follow-Up

Acute Phase

Monitor ABCs (airway, breathing and circulation), vital signs, pulse oximetry (if available), heart and lung sounds, intake and output until child is transferred to hospital.

Over the Long Term

Children with cardiac illness should be monitored regularly within the community to ensure normal growth and development and to watch for complications. Frequency of follow-up depends on the severity of the condition.

Referral

Medevac immediately.

CYANOSIS IN THE NEWBORN (BIRTH TO 6 WEEKS)

Bluish discolouration of the skin and mucous membranes secondary to hypoxia.

CAUSES

Congenital Heart Disease

Cardiac cyanosis is due to left-to-right shunting, so that systemic venous blood bypasses the pulmonary circulation and enters the arterial systemic circulation.

Findings of increased risk for congenital heart disease:

- Genetic syndromes (for example, Down syndrome)
- Certain extracardiac anomalies (for example, omphalocele)
- Maternal diabetes that is poorly controlled in the first trimester
- Exposure to a cardiac teratogen (for example, lithium, isotretinoin [Accutane], alcohol)
- Family history of significant congenital heart disease

Non-cardiac Causes

- Pulmonary infection (for example, group B streptococcal infection)
- Intrauterine infection or systemic viral infection (for example, Rubella or Coxsackie B5)
- Aspiration of meconium
- Pulmonary hypoplasia
- Respiratory distress syndrome (for example, in premature infants)
- Hypoventilation (for example, neurologic depression)
- Persistent fetal circulation: seen in post-term infants with perinatal distress or pulmonary disease

Clinical Features of Infants with Cyanotic Heart Disease

The clinical features usually present in the first week of life but may present later:

- Difficulty feeding; infant appears to tire easily
- Lethargy
- Cyanosis when feeding or active (for example, while crying)
- Perspiration on face or forehead, especially when feeding or active
- Rapid, noisy breathing

PHYSICAL FINDINGS

- Lethargy
- Cyanosis, initially of the oral mucosa; in severe cases, the cyanosis becomes generalized
- Reduced oxygen saturation
- Tachypnea
- Poor perfusion (for example, pallor or gray, ashen appearance; extremities cool; capillary refill diminished; peripheral pulses diminished)
- In coarctation of aorta, pulse quality and blood pressure may differ in different extremities
- Heart sounds may be loud
- Precordium may appear hyperdynamic (heaves or thrills may be present)
- Heart murmur may be present
- Hepatomegaly (if infant is in heart failure)

DIFFERENTIAL DIAGNOSIS

- Pulmonary causes as listed above
- Sepsis

COMPLICATIONS

- Cardiac failure *(see "Cardiac Failure")*
- Failure to thrive *(see "Failure to Thrive" in the pediatric chapter "Hematology, Endocrinology, Metabolism and Immunology")*
- Death

DIAGNOSTIC TESTS

- Pulse oximetry

MANAGEMENT

Appropriate Consultation

Consult a physician immediately and prepare to medevac.

Adjuvant Therapy

- Give oxygen 6–10 L/min (or more, if necessary) by non-rebreather mask. Titrate to keep oxygen saturations > 97%[2]
- Consider intravenous (IV) therapy with normal saline if infant is feeding poorly or is in significant clinical distress

Nonpharmacologic Interventions

- Nurse in an upright position
- Feed small amounts frequently

Monitoring and Follow-Up

- Monitor level of consciousness, vital signs, heart and lung sounds, perfusion, pulse oximetry
- Hydration status (intake and output) *(see "Clinical Features of Dehydration" in the chapter "Fluid Management")*
- Watch for signs of cardiac failure *(see "Cardiac Failure")*

Referral

- Medevac as soon as possible

RHEUMATIC FEVER (CARDITIS)

A diffuse inflammatory disease of the connective tissues, which involves the heart, joints, skin, central nervous system and subcutaneous tissue. It tends to recur. The disease arises from immune complications of group A ß-hemolytic streptococcal infection.

Rheumatic fever is much more common in Aboriginal children and in those living in lower socioeconomic circumstances. It may occur at any age but is most common in school-aged children. The risk is higher in families in which there is a history of the disease.

CAUSES

- Precedent group A streptococcal infection (pharyngitis, cellulitis) and subsequent immune response

HISTORY

The disease is nearly always preceded by streptococcal pharyngitis (occurring 2–5 weeks earlier)

The presenting symptoms are variable, but may include the following:

- Fever
- Joint pain, redness and swelling (a constellation of symptoms known as migratory arthritis, typically involving the large joints)
- Emotional lability
- Involuntary, purposeless muscular movements (known as Sydenham's chorea)
- Shortness of breath, edema, cough, fatigue (representing heart failure)
- Rash (erythema marginatum)
- Subcutaneous nodules along tendon sheaths

PHYSICAL FINDINGS

The physical findings are variable and depend on the degree of involvement of various parts and systems of the body.

- Low-grade fever
- Tachycardia (increase in resting heart rate)
- Tachypnea

Cardiovascular Signs

- Dyspnea, cyanosis, edema and hepatomegaly if the child is in heart failure
- Thrill or heave may be present
- New heart murmurs, often pansystolic
- Rubs may be audible with inspiration and expiration if disease is associated with pericarditis
- Decrease in intensity of heart sounds

Musculoskeletal Signs

- Joints hot, tender and swollen at several sites

Skin

– Rash (erythema marginatum: nonpruritic, commonly affecting trunk, proximal extremities and sparing the face)
– Nodules may be palpated in subcutaneous tissue, usually on extensor surfaces of limbs

Other Symptoms

– Emotional lability
– Involuntary, purposeless muscular movements (Sydenham's chorea)

DIFFERENTIAL DIAGNOSIS

– Congenital heart disease (previously undiagnosed)
– Viral carditis
– Rheumatoid arthritis
– Tics (which may mimic chorea)

The diagnosis is based on a complicated collection of signs known as Jones' criteria *(see Table 2, "Jones' Criteria for Diagnosis of Rheumatic Fever")*.

Table 2 – Jones' Criteria for Diagnosis of Rheumatic Fever*

Major Criteria	Minor Criteria
Carditis	Fever
Polyarteritis	Arthralgia
Sydenham's chorea	Previous rheumatic fever
Erythema marginatum	Laboratory findings: elevated ESR, WBC, C-reactive protein; decreased hemoglobin; prolonged PR or QT intervals on electrocardiogram
Subcutaneous nodules	

ESR = erythrocyte sedimentation rate;

WBC = white blood count

*Any combination of two major criteria or one major and two minor criteria is indicative of the diagnosis, in addition to evidence of recent streptococcal infection.

COMPLICATIONS

– Carditis
– Congestive heart failure
– Rheumatic heart disease (valvular damage, usually to the mitral valve)

DIAGNOSTIC TESTS

– None

MANAGEMENT

The diagnosis and treatment of rheumatic fever require evacuation to hospital. Emergency treatment of congestive heart failure may be necessary; *see "Cardiac Failure"*.

Goals of Treatment

– Identify the disease early
– Prevent complications

Primary Prevention

– Aggressive treatment of group A streptococcal throat infections with a complete course of antibiotic medications

ACUTE PHASE

Appropriate Consultation

Consult a physician immediately and prepare to medevac.

Nonpharmacologic Interventions

– Bed rest

Pharmacologic Interventions[3]

Medications should not be started until the diagnosis has been clearly established. Medications are prescribed only by a physician.

Treatment of acute rheumatic fever involves antibiotic therapy to eliminate carriage group A streptococci, anti-inflammatory therapy and if needed, therapy for heart failure.

Anti-inflammatory therapy:

acetylsalicylic acid (ASA), 80 to 100 mg/kg/day divided q6-8h in children

Antibiotic therapy to eliminate carriage of group A streptococci:

Children ≤ 27 kg

penicillin VK (Pen Vee K), 250 mg PO bid or tid for 10 days

OR

amoxicillin 40 mg/kg/day PO divided bid-tid for 10 days

OR

cephalexin 25–50 mg/kg/day PO divided bid for 10 days

If allergic to penicillin:

azithromycin 12 mg/kg PO once daily for 5 days

Erythromycin is also a suitable alternative in penicillin-allergic patients

Adolescents > 27 kg

penicillin VK (Pen Vee K), 500 mg PO bid or tid for 10 days

OR

amoxicillin 500 mg PO tid for 10 days

OR

cephalexin 500 mg PO bid for 10 days

If allergic to penicillin:

azithromycin 500 mg PO on day one, then 250 mg on days 2–5

Erythromycin is also a suitable alternative in penicillin-allergic patients.

Monitoring and Follow-Up

Monitor for signs of cardiac failure. If child is in cardiac failure, *see "Cardiac Failure"*.

Referral

Medevac.

POST-ACUTE PHASE

Pharmacologic Interventions for Prophylaxis[4]

Because of the risk of recurrence, continual antibiotic prophylaxis must be maintained. The risk of recurrence is greatest in the first 5 years after the initial bout. Prophylaxis is initiated immediately after completion of a full therapeutic course of antibiotics as described above. A physician would initially prescribe prophylaxis, usually with penicillin, sulfadiazine or a macrolide antibiotic such as azithromycin.

Prophylaxis for children without carditis should be maintained for at least 5 years and preferably throughout childhood.

If valvular disease results, lifetime prophylaxis is recommended or at least to 21 years of age.

A physician should also determine any discontinuation of prophylaxis.

VIRAL MYOCARDITIS

Myocarditis is an inflammatory disorder of the myocardium with necrosis of the myocytes and associated inflammatory infiltrate.

PATHOPHYSIOLOGY

Myocarditis generally results in a decrease in myocardial function, with concomitant enlargement of the heart and an increase in the end-diastolic volume caused by increased preload. Progressive increase in left ventricular end-diastolic volume increases left atrial, pulmonary venous and arterial pressures, resulting in increasing hydrostatic forces. These increased forces lead to both pulmonary edema and congestive heart failure.

CAUSES

It is usually caused by a viral infection. Parvovirus B19 and human herpesvirus-6 are the most frequent pathogens in patients with acute myocarditis. Infecting organisms may include the following:

- Parvovirus B19
- Herpesvirus
- Coxsackievirus types A and B (especially type B)
- Adenovirus (most commonly types 2 and 5)
- Cytomegalovirus
- Echovirus
- Epstein-Barr virus
- Hepatitis C virus
- Human immunodeficiency virus
- Influenza and parainfluenza
- Measles
- Mumps, associated with endocardial fibroelastosis (EFE)
- Poliomyelitis virus
- Rubella
- Varicella

Risk Factors

Younger patients, especially newborns and infants and immunocompromised individuals may have increased susceptibility to myocarditis.

HISTORY

Clinical presentation varies widely. In mild forms, few or no symptoms are noted. In severe cases, patients may present with acute cardiac decompensation and progress to death.

In newborns and infants, symptoms may sometimes appear suddenly and may include:

- Irritability
- Failure to thrive
- Feeding difficulties
- Fever and other symptoms of infection
- Lethargy
- Low urine output (a sign of decreasing kidney function)
- Pale hands and feet (a sign of poor circulation)
- Rapid breathing
- Rapid heart rate

Symptoms in children over age 2 may also include:

- Belly area pain and nausea
- Cough
- Fatigue
- Swelling (edema) in the legs, feet and face
- Recent, nonspecific, flu-like illness
- Older children present with similar symptoms as above and may experience lack of energy and general malaise
- Chest pain: Although rare in young children, this may be the initial presentation for older children and adolescents and should be considered a serious symptom accordingly

PHYSICAL FINDINGS

Neonates/Infants

- Hypothermia or hyperthermia
- Tachypnea
- Tachycardia
- Cyanosis
- Cool extremities
- Decreased capillary refill
- Pale or mottled skin may be present
- Wheezing, and diaphoresis with feeding
- Irritability
- Somnolence
- Hypotonia
- Seizures
- Oliguria
- End-organ damage (for example, renal failure may develop because of direct viral infestation or because of low cardiac output

Older Children

- Low grade fever
- Tachycardia, weak pulse
- Jugular venous distention and edema of the lower extremities may be present
- Heart sounds may be muffled, especially in the presence of pericarditis
- An S3 may be present
- Heart murmur caused by atrioventricular valve regurgitation may be heard
- Crackles may be heard in older children
- Hepatomegaly may be present in younger children
- Cool extremities
- Decreased capillary refill
- Pale or mottled skin may be present

Adolescents

Presentation in adolescents is similar to that of children between 6 and 12 years old. However, the following symptoms may be more prominent:

- Decreased exercise tolerance
- Lack of energy, malaise
- Chest pain
- Low-grade fever
- Arrhythmia
- Cough
- Low cardiac output

DIFFERENTIAL DIAGNOSIS

- Myocarditis, nonviral
- Pericarditis, viral
- Aortic stenosis, valvular
- Enteroviral infections
- Cardiomyopathy, dilated
- Glycogen-storage disease type I or type II
- Coarctation of the aorta
- Coronary artery anomalies

DIAGNOSTIC TESTS

Chest x-ray may show cardiomegaly and cardiac failure.

Electrocardiography (ECG)

In some patients with mild cardiac involvement, ECG changes may be the only abnormal findings suggestive of myocarditis.

- Low-voltage QRS (< 5 mm throughout the limb leads) is the classic pattern
- Pseudoinfarction patterns with pathologic Q waves and poor progression of R waves in the precordial leads may also be present
- T-wave flattening or inversion is a common finding associated with small or absent Q waves in V5 and V6
- Left ventricular hypertrophy with strain may be present
- Other nonspecific findings include a prolonged PR segment and prolonged QT interval
- Sinus tachycardia is the most common finding
- Premature ventricular contractions and atrial tachycardia have been reported
- Junctional tachycardia is common and may worsen congestive heart failure
- Occasional second-degree and third-degree atrioventricular block may be present
- Ventricular tachycardia is commonly associated and may be the initial presentation

COMPLICATIONS

- Arrhythmia
- Cardiac failure *(see "Cardiac Failure")*
- Thromboembolism
- Decrease in ventricular function
- Dilated cardiomyopathy

MANAGEMENT

Goals of Treatment

- Stabilize cardiovascular function
- Prevent complications

Appropriate Consultation

Consult a physician urgently if you suspect this condition.

Adjuvant Therapy

- Give supplemental oxygen as necessary via non-rebreather mask. Titrate to keep oxygen saturations > 97%
- Start an intravenous line with normal saline. Run at a rate sufficient to maintain hydration depending on oral intake of child. Do not overhydrate. Keep line open until consultation with an emergency physician. Always weigh infant before starting any intravenous fluids as a measure of hydration

Nonpharmacologic Interventions

- Bed rest is necessary during the acute phase of the illness
- Nurse in an upright position

Pharmacologic Interventions

Consult a physician for medication orders. Medications may include the following, when indicated: *see "Cardiac Failure"*.

- Diuretics to decrease volume:

  furosemide (Lasix), 1 mg/kg IV stat (may be given PO if IV access not available)

- ACE inhibitors may be prescribed by a physician for afterload reduction
- Digoxin may be used in some cases to increase contractility
- Antiarrhythmics
- Anticoagulants

Monitoring and Follow-Up

Acute Phase

Monitor ABCs (airway, breathing and circulation), vital signs, pulse oximetry, heart and lung sounds, neuromental status, intake and output and medication response and adverse effects closely until child is transferred to hospital.

Over the Long Term

Children with cardiac illness should be monitored regularly within the community to ensure normal growth and development and to watch for complications. Frequency of follow-up depends on the severity of the condition.

Referral

Medevac to a facility with intensive and cardiology care.

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