UBC Department of Pediatrics
Year 3
Student Orientation Manual

2011-12 Academic Year

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**PROGRAM OVERVIEW & OBJECTIVES**

**Vancouver Fraser Medical Program (VFMP)**

Paediatrics is an eight week rotation: a four-week inpatient block and four-week outpatient block. Inpatient blocks can be completed at various sites including BC Children’s Hospital, Lion’s Gate Hospital, Royal Columbian Hospital and Surrey Memorial Hospital. During the inpatient rotation, students usually are on call 1 in 4.

The outpatient block is comprised of one-to-two weeks experience in various community and subspecialty clinics. The students also have an opportunity to arrange a “designated learning project (DLP)” during their outpatient block. Students require approval from Dr. Mumtaz Virji (mvirji2@cw.bc.ca), Year 3 Clerkship Director, before arranging a DLP.

Students may choose the site for their inpatient block and the preferred outpatient experience. The Department of Pediatrics tries to accommodate all requests as best possible, keeping in mind that student rotations must provide a balanced educational experience in pediatrics.

**BC Children’s Hospital (BCCH)**

BC Children’s Hospital is a tertiary centre where students are exposed to complex patients and healthy patients requiring admission for specific illness. At BCCH, students work closely with residents and subspecialist physicians. BCCH is an inpatient rotation where students spend 100% of their time on the wards. They work with other health care professionals who closely work with patients, e.g., pharmacists, nutritionists and physiotherapists. This rotation can be very busy.

Residents started the on-call night float system in Clinical Teaching Unit effective July 1, 2009. This call system will increase educational opportunities for students. During the CTU rotation, students join family centred rounds – the rounds occur in the rooms of the patients with parents being an integral part of decision-making.

**Lion’s Gate Hospital (LGH)**

LGH offers a blended community pediatric experience. Students are exposed to a variety of ages and acuity of patients including an 8 – 12 bed Neonatal Intensive Care Unit (NICU) and a 10 – 14 bed Pediatric Ward. On-call is in-house and approximately 1:4. During the on-call hours students will be present at newborn deliveries (32 weeks upward) and see a variety of pediatric consults. When not on call, mornings are usually spent on inpatient rounds, while the afternoons are spent in pediatrician’s offices or in a variety of pediatric clinics (Eating Disorder Clinic, Immunization Clinic and Diabetes Clinic). Most students learning is accomplished with staff preceptors. During their time at LGH, students become part of the pediatric community and play an integral role in patient care.
**Royal Columbian Hospital (RCH)**

RCH offers a blended pediatric experience with exposure to a wide variety of patients. During the rotation, students interact with patients on the pediatric wards, newborn care and attend outpatient clinics with pediatricians. On the wards, students follow patients with the pediatricians, learning at teaching and neonatal rounds. Calls are in-house, 1:4.

**Surrey Memorial Hospital (SMH)**

SMH offers exposure to a variety of common pediatric cases with no shortage of patients given the very young population in the area. Inpatient blocks include rounds on the wards, nursery and interaction with chronic stable children. Students at SMH participate in the asthma clinic, diabetes clinic and cystic fibrosis clinic as well as conducting office work with community pediatricians. Students are exposed to emergency room and other consults. Inpatient at SMH is very busy and students need to be proactive and organized. On-call is in-house and approximately 1:4.

**Island Medical Program (IMP)**

The Pediatric Clerkship rotation at the Victoria General Hospital is an opportunity for medical students to care for children with a variety of acute illnesses, exacerbations and complications of chronic illness from infancy to adolescence; all seen in the hospital and in the ambulatory setting.

During the inpatient month, the medical students rotate through an open pediatric ward. Patients are cared for by a designated Most Responsible Pediatricians (MRP). Learning is supported by a pediatric teaching attending (pediatrician of the week), and two to three junior residents in the UBC Family Practice and Royal College Programs. Communication and contact with the Most Responsible Pediatrician (MRP) and On-Call Pediatricians to coordinate patient care is emphasized.

The outpatient month rotates the medical student through a variety of pediatric subspecialty clinics. Maintenance of treatment of chronic illness and evaluation of non-acute presentations of pediatric problems in the ambulatory setting is the primary focus.

**Northern Medical Program (NMP) Prince George Regional Hospital**

PGRH offers community as well as acute hospital-based pediatric care. The Pediatric Ward houses 12 beds including four Pediatric Special Care Unit beds, Level 2B and NICU with 12 beds. The Pediatric floor also houses the Pediatric Ambulatory Clinic and the visiting subspecialty clinics from BCCH. Students split themselves in to two groups of two each. They spend one month each in pediatrics and NICU.

On-Call Shifts are 1:4 over the eight week rotation. The calls are in-house. During on-call, the students shadow the pediatrician for pediatric and neonatal consults and obstetrical emergencies where the on-call pediatrician is required. Students are expected to do initial assessment, write-up and dictation of consults. They are first on-call for any on-call issues. Often
there is a Family Practice resident on call with the pediatrician. During on-call hours students will be present at newborn deliveries and caesarean sections at which the pediatrician is needed and they will also see a variety of pediatric consults. Students attend to on-call issues from the Pediatric Ward and NICU. When not on call, mornings are usually spent on inpatient rounds, while the afternoons are spent in ambulatory clinics such as a pediatrician’s office, the Child Development Centre, SCAN clinic (Child Abuse and Neglect), immunization clinics, and public health clinics.

During the rotation, students spend one to two hours each with the pediatric support team workers such as a physiotherapist, dietitian, diabetic nurse and social worker. Students are taught with an abridged version of the NRP (Neonatal Resuscitation Program) course during their rotation.

**PROGRAM OBJECTIVES**

Pediatrics program objectives have been designed to reflect Can MEDS objectives and are available for viewing on MEDICOL (http://www.elearning.ubc.ca/lms/login-to-vista). Students are expected to be aware of the program objectives for Pediatrics.

During the Pediatric clerkship rotation, students are expected to accomplish the following:

- Acquire a basic knowledge of growth and development (physical, physiological and psychosocial) and understand its clinical application from birth through adolescence.
- Develop communication skills that facilitate clinical interaction with infants, children of different ages, adolescents and their families, ensuring that complete, accurate data is obtained.
- Develop skills to take a complete Pediatric history from parents and the child where appropriate.
- Develop competency in the physical examination of infants, children, and adolescents.
- Acquire the knowledge necessary for the diagnosis and initial management of common, acute and chronic illnesses.
- Develop clinical problem-solving skills.
- Acquire an understanding of the influence of family, community and society on child health and disease.
- Develop strategies for health promotion as well as disease and injury prevention.
- Develop the attitudes and professional behaviours appropriate for clinical practice.
TOP 10 STUDENT RESPONSIBILITIES

1. History, Physical and Case Presentations

- Two written assignments need to be submitted.
- First H&P should be submitted on the Friday of Week 2 in the program.
- Do not include patient’s name, hospital or chart number in the assignment.
- A complete history (appropriate pediatric history as per example), physical examination, problem list and differential diagnosis are expected.
- Special emphasis should be placed on assessment of the patient at the time of admission including vital signs, when the patient was examined and management plan.

Students can hand in the history hand-written for the patient’s chart but it must be legible and it must fulfill all the criteria for a good H&P. [https://www.medicol.med.ubc.ca/](https://www.medicol.med.ubc.ca/)

- The second assignment will be a complete history and physical that should be submitted on the Friday of the 5th week in the program.
- All students need to submit their written assignments to their preceptors/discipline specific site leaders (DSSLs) at the specific sites where they are rotating at the date of submission.
- Feedback is the most important part of this process.
- Grades will be assigned
  - 60% Needs improvement
  - 75% Meets requirements
  - 85% Exceeds requirements

2. Academic Half Days (AHD)

- AHDs are held on Thursdays from 12:30 to 4:00 pm.
- Attendance is mandatory for all students, unless post-call.
- Attendance is taken at AHD: if a student misses a sessions without cause, he/she may be required to meet with the Clerkship Director or the Site Director.
- All AHD materials are available on MEDICOL. Students are expected to review the topic prior to Half Day and arrive prepared to discuss issues.
- Students evaluate Half Day Lecturers using the One45 Lecturer Evaluation Form PDF
• Most AHD sessions will be available by video-conference to peripheral sites (depending on the request). When conferencing in from various sites, students need to seat themselves within camera range so the lecturer is aware of the audience and can interact with everyone.

3. Mini CEXs

Four (4) Mini-CEXs including a newborn CEX are required from student.

So, one each of the following should be completed:

- History
- Physical
- Newborn (If it was not done previously or proof if it was done)
- The other one can be any of the following: Counselling, Presentation or Clinical Reasoning Skills.

Students should fill out a SCAG form when encountering a teenage patient.

Mini CEXs are a good feedback tool; please request the preceptor’s presence so the preceptor can observe you appropriately and give you proper feedback.

The aim of the Mini CEX is to have a faculty member or resident observe a student doing a specific task and provide helpful feedback on technique.

DUE DATES: Mini CEXs are due Friday of Week 7 of the rotation.

4. CLIPP Cases [http://www.med-u.org]

• Minimum 20 cases are required; however, students are encouraged to do more CLIPP Cases. The Clerkship Director / teaching fellow track student progress.

• Statistics show more CLIPP cases done, better the chances of getting good score in NBME.

5. Mid-rotation Formative Quiz

• This is mandatory and should be submitted on time.

• To give a more formative evaluation to the students, a mid-rotation multiple choice examination is administered to the students via MEDICOL.

• Students will be notified of deadline to submit their mid-rotation quiz. Once the quiz is submitted you cannot retrieve the questions again. So make sure you answer the questions before submitting the quiz.

• A follow-up session with students to discuss the questions will be arranged one week following the quiz (during Academic Half Day) and will be video-conference to all sites.
• If a student does not submit the Mid-rotation quiz, a comment will be made on the evaluation form.

6. Student Presentations

• Presentations are 12 minutes with 3 minutes Q & A.
• Presentations are made during the inpatient rotation, to be given to the group / DSSL.
• Power point slides are required. Please see the sample presentation format on MEDICOL
• Topics can be common pediatric problem or review of a CLIPP case.
• There will be no marks for the presentation but preceptors will fill out a student presentation mini CEX, which should be submitted to the teaching fellow / clerkship director.

7. On-Call Schedule

• Students do have the opportunity of requesting no calls on specific dates. Every effort will be made to honour these requests but accommodation is not guaranteed.
• These requests should be submitted with student selections, as placement is done according to student requests.
• Once the schedule is made, further changes will NOT be accommodated.
• Students usually do call 1 in 4. They are excused from clinical duties around noon the next day.
• At BC Children’s Hospital, residents use the night float call system in the CTU. Students will also be doing night float system; It has been shown that night float provides more teaching and learning opportunities for trainees during the night hours.

8. Logging

There are two lists for logging and patient encounters. One is the general Year III must see and do. In addition, there is the Pediatric specific list for patient encounter and logging. Students must complete both the lists.

Patient Encounter:  https://www.medicol.med.ubc.ca/

Students need to log in patient encounters regularly. If there are any concerns about the patients not seen, please contact the Clerkship Director or the DSSL at your specific site. Patient Encounter Logs are monitored regularly.

Procedure Logging  https://www.medicol.med.ubc.ca/

Students need to log in procedures regularly. If there are any concerns about the procedures, please contact Clerkship Director or DSSL at your specific sites. These will be monitored regularly.
9. **Medical Reconciliation Process**

When admitting a patient to a ward, medication reconciliation process must be done for each admission.

Medication Reconciliation process includes the following:

- Obtain the patient’s medication history from the most reliable source
- Record medications on Medication History & Order form on admission. This includes prescriptions, over the counter medications, and complementary alternative medications. If possible include the date and time of last dose.
- Indicate by a “check mark” whether you wish to continue or stop the medication.
- Sign off the medication order sheet with date, time, signature, ID and pager number.

10. **OSCE & NBME**

At the end of rotation, students are evaluated by Clinical Faculty with an Objective Structured Clinical Examination (OSCE), and they also write a Pediatrics Subject exam from the National Board of Medical Examiners (NBME).

The OSCE consists of five stations, with pediatric content. It comprises of one history, one physical, and one counselling station. The other two stations comprise of two of the following: picture, radiology or data.

The NBME is a 100 question multiple choice question exam. Students are given 2 hours and 50 minutes to write the exam. [http://www.nbme.org/](http://www.nbme.org/).


**Supervision**

Students must be supervised directly or indirectly at all times.

**History & Physical**

Must be completed, reviewed and countersigned by the attending physician or resident within 24 hours of admission.

**Orders**

Orders must be written under appropriate supervision of attending physician or resident. For all orders clerks must sign orders:

- Signature
- Printed name
- Year 3, Class 2011
- College of Physician and Surgeons of British Columbia identity number (CPSID)
- Pager or cell #
- Discussed with Dr. ________________
- Write the name of resident or attending physician the order was discussed with.

**Procedures**

Clerk may perform procedures under appropriate supervision. (For details please see the P&P manual posted on MEDICOL). [https://www.medicol.med.ubc.ca/](https://www.medicol.med.ubc.ca/)

Clerks may not discharge a patient from ward in the hospital, from emergency department or outpatient department. Patients can only be discharged once approval has been given by a senior resident or attending.

Clerks cannot sign birth and death certificates, mental health certificates or other medico-legal documents, although they may carry out the task of certifying death.

Prescriptions to be filled outside the hospital cannot be signed by clerks.

In Pediatrics clerks are usually not expected to dictate consultation or discharge letters. They may do so for their own learning purposes with appropriate supervision of the preceptor.

EVALUATIONS & MARKS

Mid-rotation Evaluation of Students  

Midway through the rotation students will have a Mid-rotation evaluation. Any concerns students have about the rotation should be directed to the DSSL and the clerkship director as soon as identified. 

Student Evaluation by the Preceptor  

Evaluations are available on One45. The preceptor will receive an email reminder to fill out the evaluations. It is the student’s responsibility to make sure the evaluations are done before end of rotation. Students scheduled two weeks or more within a specific discipline or site should ensure an evaluation is completed. If a preceptor you have worked with for one week, gives you good feedback, ask him/her to fill out an evaluation (copy can be obtained from program assistant). The comments will be transcribed to your overall evaluation.

The comments from your evaluation forms will not be transcribed on the MSPR. It is for your feedback only.

The evaluations form is a major component of a student’s clinical mark. Students are evaluated on the basis of knowledge, behaviour, interpersonal skills, and willingness to accept feedback and make changes accordingly. Students are also evaluated on their skills to perform an appropriate pediatric history and physical examination, their ability to present during the rounds and to effectively interact with the families and team members.

Faculty/Service Evaluations (by the student)  

It is very important for students to evaluate the faculty and services they work with during their eight week rotation. The feedback received from the students helps us improve the programs. Thus make sure you do fill out the faculty and service evaluation forms. Comments received from students remain anonymous and help the Department make changes to improve the program. Assessment of Preceptor PDF; Service Evaluation Form PDF; Evaluation of Bedside Teaching PDF

Marks for the Year 3 Pediatric Clerkship  

Marks for the Pediatric clerkship are divided into three components:

1. Clinical marks = 40% to total grade
2. NBME score = 35% of total grade
3. OSCE score = 25% of total grade

The Clinical marks include the end of clerkship assessment score (85%); 2 history and physical with critical reasoning (10%); and the mini CEXs (5%).
**ADMINISTRATIVE MATTERS**

**Staying in Touch with the Department Office**

The primary contact at VFMP is Alejandro Huerta Rodas (ahuertarodas@cw.bc.ca).

Please make sure we have your appropriate contact information when contacting sites.

The Department of Pediatrics usually sends important time-sensitive information via e-mail. Students are expected to answer e-mail within 24-48 hours and to respond to pages within minutes of receiving them; whether paged from the administrative offices or wards.

**Dress Code**

Students are not expected to wear white coats in Pediatrics, but should be dressed appropriately. No flip flops, jeans or shorts. Dress professionally.

We deal with people of multiple cultures and students should be sensitive to the various cultures.

Most of the areas in the hospital are scent free. Please respect these policies. Many of our staff and patients have allergies and asthma.

Name tags should be worn at all times.

**Absences**

As per the Policies and Procedures Manual for Students in Year 3, Academic Year 2011-12

https://www.medicol.med.ubc.ca/:

“In extraordinary circumstances, students may have an Unavoidable Absence or request an Anticipated or Negotiated Absence from their clinical education. Most students will miss no time from core clinical rotations. We expect all students to approach potential absences in a professional manner, and seriously consider implications for their education, their patients and fellow members of the medical team. Therefore, a request for leave will be reviewed, and either approved or not approved.”

For Pediatrics, absences and leaves are managed by the Year 3 Clerkship Director – Dr. Mumtaz Virji (mvirji@cw.bc.ca) or site directors in consultation with the DSSLs.

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The following procedures outline the steps that must be taken in the event that a student is considering an Absence, (either Unavoidable, Anticipated, or Negotiated), from their studies.

**Unavoidable Absences: Illness, injury, family emergency or bereavement**

- The student will notify the preceptor responsible for the session being missed (phone or in person) at their earliest opportunity and, when possible, before the start of the session. Do not ask your colleagues to pass on the message to your preceptor. Most of the preceptors are easily reachable.

- The student will contact the appropriate Site Program Assistant via e-mail or phone.

- Upon their return, the student must provide the Site Program Assistant with a Record of Student Absence Form reporting an Unavoidable Absence.

- Students should outline what action they propose to take in order to catch up on missed work (if more than two days) and how they will fulfill their clinical responsibilities on the

**Anticipated Absences**

- For medical or dental appointments or religious holidays (for a complete list, please refer to: [http://www.students.ubc.ca/index.cfm?page=links&view=courses](http://www.students.ubc.ca/index.cfm?page=links&view=courses))

- Students will attempt to book medical or dental appointments for times outside of scheduled clinical duties.

- Prior to the Anticipated Absence
  
  i. The student will contact the Year 3 Clerkship Director – Dr Mumtaz Virji -- or the site director in a timely fashion to discuss the potential for an Anticipated Absence.

  ii. If the Anticipated Absence is approved by Dr. Virji or site director, the student will complete a Record of Student Absence Form and have Dr. Virji or site director sign it. Student should outline what action they propose to take in order to catch up on missed work (if more than two days) and how they will fulfill their clinical responsibilities on the Record of Student Absence Form.

  iii. The student will submit the signed/approved Record of Student Absence Form to the appropriate Departmental site Program Assistant and the Year 3 Program Manager (Dean’s Office).

  iv. The student will notify the appropriate preceptor responsible for the session being missed.
**Negotiated Absences**

- Negotiated absences are for academic pursuits of a one-time nature (e.g., commencement exercises, attendance at a scientific meeting to present a paper or accept an award), participation in major varsity team events, participation in major faculty activities or in worthy social endeavours (e.g., planning a fund-raising event, education or other community event), or rare occurrences (e.g., compassionate leave, marriage).

- Please note that Negotiated Absences may or may not be granted and are at the discretion of the Year 3 Clerkship Director – Dr. Mumtaz Virji or the site director.

- Prior to the Negotiated Absence
  
  i. The student will contact the Year 3 Clerkship Director – Dr. Mumtaz Virji or the site director – to discuss the potential for a Negotiated Absence. This should be done at the time of selection of inpatient / outpatient rotations i.e. eight weeks in advance.

  ii. If the Absence is approved by Dr. Virji or the site director, the student will complete a Record of Student Absence Form for Dr. Virji or the site director to sign. The student should outline what action they propose to take in order to catch up on missed work (if more than two days) and how they will fulfill their clinical responsibilities on the Record of Student Absence Form.

  iii. The student will submit the signed/approved Record of Student Absence Form to the appropriate Departmental site Program Assistant and the Year 3 Program Manager (Dean’s Office).

  iv. The student will notify the appropriate preceptor responsible for the session being missed.
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<td>Program Assistant</td>
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<td>Ms. Michelle Bandalo</td>
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<td><a href="mailto:michelle.bandalo@interiorhealth.ca">michelle.bandalo@interiorhealth.ca</a></td>
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<th>SMP - Kamloops</th>
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<tr>
<td>DSSL</td>
<td>Dr. Trent Smith</td>
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<td><a href="mailto:thompsonnicolapeds@telus.net">thompsonnicolapeds@telus.net</a></td>
</tr>
<tr>
<td>Program Assistant</td>
<td>Deb Lingel (RIH)</td>
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<td></td>
<td><a href="mailto:deb.lingel@interiorhealth.ca">deb.lingel@interiorhealth.ca</a></td>
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The following documents are available from the UBC Pediatrics Website, Undergraduate Program Student Orientation Manual


<table>
<thead>
<tr>
<th>CLIPP Cases</th>
<th>COMPSEP Curriculum &amp; Clinical Encounters</th>
<th>Competencies and Objectives</th>
<th>History and Physical Template</th>
<th>ISMP Dangerous Abbreviations</th>
<th>Mini CEX</th>
<th>Procedure and Patient Encounter Log</th>
<th>SOAP Notes</th>
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<th>Useful Links &amp; Recommended Textbooks</th>
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The following is a list of the available CLIPP Cases in Pediatrics:

- Prenatal and newborn - Thomas
- Infant well child (2, 6 and 9 months) - Asia.
- 3-year-old well-child check - Benjamin.
- 8-year-old well-child check - Jimmy.
- 16-year-old girl's health maintenance visit - Betsy.
- 16-year-old boy's presport physical - Mike.
- Newborn with respiratory distress - Adam.
- 6-day-old with jaundice - Meghan.
- 2-week-old with lethargy - Crimson.
- 6-month-old with a fever - Holly.
- 5-year-old with fever and adenopathy - Jason.
- 10-month-old with a cough – Anna.
- 6-year-old with chronic cough - Sunita.
- 18-month-old with congestion - Rebecca.
- 6-week-old with vomiting - John.
- 7-year-old with abdominal pain and vomiting - Isabella.
- 3-year-old refusing to walk - Emily.
- 2-week-old with poor weight gain - Tyler.
- 16-month-old with first seizure - Ian.
- 7-year-old with a headache - Nicholas.
- 6-year-old with a rash - Melanie.
- 16-year-old girl with abdominal pain - Mandy.
- 11-year-old girl with lethargy and fever - Sarah.
- 2-year-old with altered mental status - Matthew.
- 2-month-old with apnea - Jeremy.
- 9-week-old not gaining weight - Bobby.
- 8-year-old with abdominal pain - Jenny.
- 18-month-old with developmental delay – Anton.
- Infant with hypotonia – Daniel.
- 2-year-old with sickle cell disease - Gerardo.
- 5-year-old with puffy eyes - Katie.
**CLIPP log in information:**

Go to [www.clippcases.org](http://www.clippcases.org)

Click on the "Registering" link in the list at the left of the page

- **Registering to use CLIPP (for institutional users)**
- **Click Go to Cases at left. The CLIPP login page will open.**
  
  Click the register link, which appears after the question, "You are a new user?":

  ![The webpage has a picture here]

- **In the top box, type your medical school e-mail address (i.e., Jane.Doe@medicalschool.edu), your first name and your last name. Enter your status in the last field.**

- **Read the CLIPP Site User Terms and Conditions in the bottom box.**
  
  Click Accept or Decline, then click OK.

- **If you clicked Accept, the system immediately will send you a Login and Password (a randomly generated 6-digit number) in two e-mail messages. The e-mail messages come from clippcases@instruct.de. Be sure to save the login and password for future use. Your login name cannot be changed. To edit your password, see the instructions for "Changing your password" below.**

- **Logging in to CLIPP after you register (all users)**

  Once you have your Login and Password:

  Go to [www.clippcases.org](http://www.clippcases.org)

  - **Click Go to Cases in the left frame.**
  
  - **On the Login page, type your Login and Password.**
  
  - **Click Login. The Case Selection page opens.**
  
  - **On the Case Selection page, click the name of the desired case (or click Open case... to the right of the name).**
  
  - **The case will open.**
This table reflects the consensus on the types of patients a student should see, the setting, and level of student involvement during the clerkship experience.

Most alternate learning experiences are CLIPP cases.

<table>
<thead>
<tr>
<th>Types of Patients to be Seen</th>
<th>Number required to be seen (real or simulated)</th>
<th>Level of student responsibility* (OB, PP, FP)</th>
<th>Clinical setting+ (O, I, E)</th>
<th>Alternative clinical learning experience ^</th>
<th>Docm’t. (Date, signature, student initials)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Maintenance</td>
<td></td>
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<tr>
<td>Domain- patient type/core condition</td>
<td>Symptom, sign, or concern</td>
<td>Examples of diagnosis or issue addressed</td>
<td>O</td>
<td>CLIPP case 1</td>
<td></td>
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<tr>
<td>Well child care</td>
<td>Newborn (0-1 month)</td>
<td></td>
<td>O</td>
<td>CLIPP case 2</td>
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<tr>
<td>Well child care</td>
<td>Infant (1-12 months)</td>
<td></td>
<td>O</td>
<td>CLIPP case 3</td>
<td></td>
</tr>
<tr>
<td>Well child care</td>
<td>Toddler (12-60 months)</td>
<td></td>
<td>O</td>
<td>CLIPP case 4</td>
<td></td>
</tr>
<tr>
<td>Well child care</td>
<td>School aged (5-12 years)</td>
<td></td>
<td>O</td>
<td>CLIPP case 5, 6</td>
<td></td>
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<tr>
<td>Well child care</td>
<td>Adolescent (13-19 years)</td>
<td></td>
<td>O</td>
<td>Computer case 1</td>
<td></td>
</tr>
<tr>
<td>Growth</td>
<td>Parental concerns or abnormalities related to the domain</td>
<td>FTT, poor weight gain, obesity, short stature, microcephaly, macrocephaly, constitutional delay, small for gestational age, large for gestational age</td>
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<tr>
<td>Nutrition</td>
<td>Parental concerns or abnormalities related to the domain</td>
<td>FTT, breast vs. formula feeding, questions about switching to formula, when to add solids, beginning cow’s milk, diet</td>
<td></td>
<td></td>
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<tr>
<td>Development</td>
<td>Parental concerns</td>
<td>Delayed or possibly</td>
<td></td>
<td></td>
<td>CLIPP case</td>
</tr>
<tr>
<td>System</td>
<td>Signs or symptoms</td>
<td>Notes</td>
<td>References</td>
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<tr>
<td>Behavior</td>
<td>Parental concerns or abnormalities related to the domain</td>
<td>Sleep problems, colic, temper tantrums, toilet training, feeding problems, enuresis, ADHD, encopresis, autistic spectrum disorder, eating disorders, head banging, poor school performance</td>
<td>CLIPP case 4</td>
<td></td>
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<tr>
<td>Upper Respiratory Tract</td>
<td>Sore throat, difficulty swallowing, otalgia</td>
<td>Pharyngitis, strep throat, viral URI, herpangina, peritonsillar abscess, common cold, allergic rhinitis, otitis media, sinusitis, otitis externa</td>
<td>CLIPP case 14</td>
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<tr>
<td>Lower Respiratory Tract</td>
<td>Cough, wheeze, shortness of breath</td>
<td>Bronchiolitis, bronchitis, pneumonia, aspiration, asthma, bronchiectasis, aspiration, asthma, bronchiectasis</td>
<td>CLIPP case 12, 13</td>
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<tr>
<td>Gastrointestinal Tract</td>
<td>Nausea, vomiting, diarrhea, abdominal pain</td>
<td>Gastroenteritis, giardiasis, pyloric stenosis, appendicitis, HSP, peptic ulcer disease, gastroesophageal reflux disease</td>
<td>CLIPP case 15, 27</td>
<td></td>
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<tr>
<td>Dermatologic system</td>
<td>Rash, pallor</td>
<td>Viral rash, scarlatina, eczema, urticaria, contact dermatitis, toxic shock, thrush, atopic dermatitis, seborrheic dermatitis, acne, anemia</td>
<td>CLIPP case 3, 21</td>
<td></td>
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<tr>
<td>Central nervous system</td>
<td>Lethargy, irritability, fussiness, headache</td>
<td>Meningitis, concussion, seizures, ataxia, closed head injury, headache</td>
<td>CLIPP case 20, 24, 28</td>
<td></td>
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<tr>
<td>Emergent Clinical Problem</td>
<td>Respiratory distress, shock, ataxia, seizures, airway obstruction, apnea, proptosis, suicidal ideation, trauma, cyanosis.</td>
<td>Meningitis, shock, testicular torsion, DKA, SIDS, acute life threatening event (ALTE), congestive heart failure, burns, status asthmaticus, status epilepticus, encephalitis, child abuse etc.</td>
<td>CLIPP cases: 23, 25</td>
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<tr>
<td>Chronic medical problem</td>
<td>seasonal allergies, asthma, cerebral palsy, cystic fibrosis, diabetes mellitus, malignancy (e.g. acute lymphocytic leukemia or Wilms tumor), sickle cell disease, epilepsy, atopic dermatitis, obesity, sensory impairment, HIV/AIDS</td>
<td></td>
<td>CLIPP cases: 30, 31</td>
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<tr>
<td>Unique condition: fever without localizing findings</td>
<td>fever</td>
<td>rule out sepsis; urinary tract infection, systemic viral infection (e.g. EBV), autoimmune diseases</td>
<td>CLIPP case 10</td>
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<tr>
<td>Unique condition: neonatal jaundice</td>
<td>jaundice</td>
<td>jaundice</td>
<td>CLIPP case 8</td>
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</table>

**Table Key**

- **OB** = Observation (CR only)
- **PP** = Partial participation (Hx or PE)
- **FP** = Full participation (Hx, PE and CR)
- **CR** = Clinical reasoning
- **Hx** = History taking/data gathering
- **PE** = Physical examination
- **+O** = Outpatient
- **I** = Inpatient
- **E** = Emergency

Most alternate learning experiences are CLIPP cases.
Pediatric Competencies and Objectives – CanMEDS Format

On completion of the rotation in Pediatrics, the trainee will be able to complete the following:

**MEDICAL EXPERT**

- **KEY** Prepare a complete written summary of the history and physical and orally present the case in a focused and chronological manner.

- Identify clinical problems and outline an initial diagnostic and therapeutic plan.

- Know when hospitalization and diagnostic tests are indicated.

- Describe the content of a health supervision visit and the factors used to determine the frequency of such visits.

- Gather health supervision data from a focused history and physical examination

  - Health supervision competencies
    - Discuss the appropriate use and interpretation of the following screening tests:
      - Neonatal screening
      - Developmental screening
      - Hearing and vision screening
      - Lead screening
      - Drug screening

- Growth Competencies
  - Accurately measure height, weight and head circumference and plot the data on an appropriate chart
  - Include an assessment of growth in the patient work-up
  - Identify abnormal growth patterns and explain the initial assessment
  - Outline the initial evaluation of a child with failure to thrive

- Development Competencies
  - Perform appropriate developmental screening on all patients as part of the health maintenance visit or inpatient evaluation
  - Perform and interpret a DDST
• Summarize the main adolescent developmental changes that are important to discuss with parents and adolescents

• Explain how to perform the sexual maturity rating (Tanner).

Behavior Competencies

• Take a complete and relevant history and perform a pertinent physical examination on a patient who presents with a behavioural problem

• Elicit age appropriate behavioural concerns during the health supervision visit

• Distinguish between age-appropriate "normative" behaviour and serious psychiatric illness

Nutrition Competencies

• Provide families nutritional counselling regarding:
  a. Infant breast feeding vs. formula feeding
  b. When / why solids are added to an infant's diet
  c. Use of cow's milk, formula vs. modified formula.

• Advise families about the dietary prevention and treatment of common paediatric mineral (iron, fluoride, and calcium) and vitamin (D) deficiencies

• Obtain a routine diet history on an infant that includes: the type of feeding (breast vs. formula) with amount and frequency, types and approximate amounts of solids, and diet supplements given (vitamins, fluoride, iron) and evaluate its appropriate needs.

• Determine whether a formula-fed infant is receiving adequate calories

• Recognize when nutritional assessment is necessary beyond infancy, and demonstrate how to obtain a daily diet diary with the assistance of a nutritionist.

Issues Unique to Adolescents

• Conduct a HEADSS interview.

• Conduct a health maintenance visit on a healthy adolescent incorporating a developmental assessment, risk behaviour assessment, and preventive counselling.

• Describe pertinent features of the history, physical examination when evaluating a boy or girl with delayed and advanced pubertal development.

Issues Unique to Newborns
• Gather appropriate history from parents/guardian and chart; perform a physical exam on a well or ill newborn and describe routine issues to counsel parents about

• Develop a reasonable differential diagnosis and evaluation scheme for newborns with clinical presentations as described in objective a.

• Medical Genetics and congenital malformations--Gather basic data from history/physical exam and consider useful laboratory tests when evaluating a child with a possible common genetic disorder or a congenital malformation

Common Pediatric Illnesses

• Develop a diagnostic approach to any of the clinical problems listed in the Tables 2 and 3 below

• Explain how the physical manifestations and the evaluation and management of many paediatric illnesses vary with the age of the patient. Give specific examples.

• Discuss the characteristics of the patient and of the illness that must be considered when making the decision to manage the patient in the outpatient setting or to admit to hospital.

• Demonstrate knowledge of the common medications/treatment regimes used in the paediatric inpatient and Nona cute outpatient treatment of the most common chronic illnesses.

Therapeutics

• Demonstrate the ability to write a prescription.

• Explain how a drug dose is calculated for infants and children.

• List the most common generic types of medications used for management of the following uncomplicated conditions
  a. Otitis media
  b. Wheezing
  c. Conjunctivitis
  d. Allergic rhinitis
  e. Urinary tract infection
  f. Impetigo
  g. Eczema
h. Fever
i. Streptococcal pharyngitis
j. Acne

Fluid and Electrolyte Management

• Obtain historical information to assess state of hydration
• Know how to calculate normal (maintenance) fluid requirements.
• Recognize the physical exam findings of dehydration
• Calculate and write IV orders for initial fluid replacement and maintenance fluids for a patient with dehydration.
• Recognize the initial presentation of DKA, diabetes type I, II and the principles of team management.
• Explain the clinical consequences of electrolyte disturbances, including hyponatremia, hypernatremia, hypokalemia, and hyperkalemia, and discuss the effect of pH on the serum potassium level

Poisoning

• Elicit an appropriate history surrounding ingestion (type, route, amount, and timing), demonstrating sensitivity to the emotions of guilt and anxiety that may be present in the parent or caregiver
• Demonstrate knowledge about the use of the poison control centre and other information resources in the management of the patient with an ingestion

Pediatric Emergencies

• Recognize how the signs of shock in a child differ from those of an adult
• For each condition listed in the right hand column of Table 4, provide the acute clinical presentation and initial diagnostic assessment.

Child Abuse (Physical and Sexual)

• Know the types of questions to ask in assessment of a child for suspicion of non-accidental injuries and child abuse
• Summarize the ethical and legal responsibilities to identify and report child abuse and the obligation placed on reporters by community or state
**COMMUNICATOR**

*KEY* Show empathy and compassion when talking to families and children.

Discuss how to relate news of a serious acute or chronic illness or a congenital abnormality to parents. How would your discussion differ with the child or the adolescent?

Effectively communicate information about the diagnosis and treatment to the patient and caregiver.

Describe one's approach to counselling a teenager concerned about contraception and sexually transmitted diseases and AIDS, or a youth who engages in smoking or "binge" drinking.

Explain to parents how to use oral rehydration therapy for mild/moderate dehydration.

**COLLABORATOR**

*KEY* Demonstrate tolerance of parent and family differences in attitudes, behaviours and lifestyles.

Recognize when a child or adolescent is at risk and know when and how to intervene. Provide examples that demonstrate how child rearing practices differ across cultural and ethnic groups and in socioeconomic situations.

Demonstrate an understanding of the physician's and parent's role in gradually fostering a child's self-management of a chronic condition.

**MANAGER**

*KEY* Manage time effectively between work, study, recreation and other commitments.

Select the diagnostic tests which are most likely to be useful and be aware of their costs and limitations.

**HEALTH ADVOCATE**

*KEY* Evaluate patients from infancy through adolescence in a variety of clinical settings, establishing rapport with the patient and family in order to obtain a complete history and physical examination.

Initiate a discussion about immunizations with the family of an infant, a toddler, and a child about to enter school. Include immunization side effects.

Counsel an adolescent about hepatitis B prevention

Provide anticipatory guidance about injury prevention to the family of an infant, a toddler, a preschool age child, school age child and adolescent. Also direct prevention strategies to older children and adolescents.

Demonstrate the inclusion of prevention in every clinical encounter, including the assessment of immunization status.
Recognize the impact on school attendance and function caused by chronic illnesses, and distinguish between conditions that affect cognitive function and those that do not.

Explain how a physician can promote normal development and maturation in the presence of a chronic medical condition or disability.

Provide anticipatory guidance regarding home safety and appropriate techniques to prevent accidental ingestions.

Identify the ways that practicing physicians can advocate for children.

Describe the types of problems that benefit more from a community approach rather than an individual patient approach.

SCHOLAR

**KEY** Obtain up-dated information relevant to the diagnosis and treatment of the patient, performing a literature search and critical review of the literature.

PROFESSIONAL

**KEY** Demonstrate the professional conduct (honesty, integrity, compassion, and respect) necessary for a successful clinical interaction.

Explain in general terms how to conduct an interview and physical exam of an adolescent with his or her parent. In addition, outline how the results of the examination and any diagnostic tests should be discussed with the adolescent and parent.

Demonstrate intellectual curiosity, initiative, responsibility, and reliability.

Understand the need for reliability and integrity in all patient encounters.

Attends all curricular activities in a timely fashion.
### Key Learning Objectives with Assessment Methods

<table>
<thead>
<tr>
<th>Key Component Addressed</th>
<th>Assessment Method</th>
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<td>MEDICAL EXPERT</td>
<td>History and physical</td>
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<td>Case report</td>
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<td>Patient encounter and clinical procedure log</td>
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<td>Midrotation quiz</td>
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<td>Student presentation</td>
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<td>Mini CEX</td>
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<td>NBME</td>
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<td>Final clinical assessment</td>
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<tr>
<td>COMMUNICATION</td>
<td>Mini CEX</td>
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<td>Case report</td>
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<tr>
<td>HEALTH ADVOCATE</td>
<td>Chart review</td>
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<td>Final clinical assessment</td>
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<td></td>
<td>Model behaviour</td>
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<tr>
<td>PROFESSIONAL</td>
<td>Chart review</td>
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<td>Final clinical assessment</td>
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<tr>
<td>MANAGER</td>
<td>Final clinical assessment</td>
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<tr>
<td>COLLABORATOR</td>
<td>Final clinical assessment</td>
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</tbody>
</table>
History and Physical Template (Guidelines)

**ID**

Name, age, gender, known illnesses and CC: - one word sentence of main concern often using words of parent or child

e.g. Luke is a 1-year-old previously healthy Caucasian boy presenting with a 2-day history of cough and difficulty breathing

**Informant**

All sources of information for your history and their reliability

e.g. History from reliable mother and review of ER records

**HPI**

The information is the same for any medical problem. A careful and complete description of the presenting problem, with appropriate chronology is key. Always include pertinent positives/negatives and relevant family history or social history items. An important distinction is that much of the history will be observations from a third party (parent/caregiver). Important questions include: mood, activity level, eating pattern, urine output (specific as possible), sleep pattern and a description in the parents word what the problem is, how it has changed, what they have tried to alleviate the symptoms and what they think is causing the child’s illness.

**Allergies**

Allergies and reactions

**Medication**

Any prescription medications, over the counter medications or herbs/supplements

Include doses when known.

**Immunizations**

Ask about receipt of immunizations in every patient; there are standard immunizations given at specific ages. Parents sometimes have the immunization record; If the child has not received immunizations, delicately explore the reasons why. Saying “up to date” is not an appropriate response, try to document what immunizations were given and when. It is important to ask about if any of the immunizations were paid for.
Past Medical History

Birth/Pregnancy History

*For infants, this component is particularly important.* Often birth/pregnancy history is either relevant to the chief complaint or represents the majority of the PMH. Make sure to include these questions on all infants and any child with a problem that might be related to perinatal/neonatal issues. We usually include this in all children.

Maternal: mother’s age, gravida, para, health problems and medications

Pregnancy: complications, prenatal care/labs/tests

Labour: Duration of membrane rupture and complications

Delivery: Gestational age (at a minimum whether term or premature), Mode (vaginal/C section/forceps/vacuum), Apgars and birth weight

Neonatal: Duration of hospitalization and any events that occurred shortly after birth.

Medical history

Any medical problems or hospitalizations with a brief summary and dates

Specifically ask about the last health supervision visit.

Surgical history

Any surgeries and dates

Family history (include genogram)

Explore any diseases that are in the family (e.g. hypertension, diabetes, or other problems resembling the child’s problem). Also gently explore any miscarriages or childhood deaths in the family. Ask about consanguinity. Family chart should be included.

Social history

Ask who lives in the home and whether there are other siblings and the state of the siblings’ health. Explore childcare arrangements—whether it is the family, an in-home setting or center based (larger classrooms). Inquire about what languages are spoken at home. If the child is verbal, directly ask them about school/daycare, friends, and favourite past times/toys, pets and siblings/family members. Identify sources of stress for the parents.

Diet

Description of diet: Particularly important in the first year of life or if growth is abnormal.

Comment whether breast feeding or formula feeding (and what type of formula and how much) in infants. Ask about typical diet in older children or about concerns the parents may have.

Important to ask how much milk and how much juice a child is drinking.
Developmental

This should be part of every history.

The way you ask the questions will change over time; Start with an open ended question to parents like “tell me what types of things your child is doing now?” Childhood development is often categorized into four domains (social, fine motor, gross motor and language) and screening questions in each domain should be explored. Screening questions should fit age of child.

In older children, make sure to ask about their hobbies, activities, school and friends. Assess academic achievement from parents/patient in older children.

Review of Systems

This section is similar to that for adult patients. Remember that preverbal children cannot report many of the symptoms, so parental observation is the main source of information. A sample – remember this is just a sample and you will learn what questions you ask.....

General: fever, weight changes (loss or gain), activity, sleep. Any concerns with vision or hearing

HEENT: ear or eye pain or d/c, nasal d/c, sore throat, hoarseness

Respiratory: cough, wheezing, apnea, cyanosis, difficulty breathing

Cardiovascular: murmurs, chest pain, palpitations, syncope, edema

Genitourinary: frequency, dysuria, urine out put, hematuria, how frequently does the child void

Skin: rashes

Neurology: seizures, loss of consciousness

Gastrointestinal: feeding/appetite, vomiting, diarrhea, constipation, blood in the stool, abdominal pain

Musculoskeletal: joint swelling, pain, tenderness, weakness

Psychology: mood changes, sleep problems

Heam/lymph: bleeding, anemia, jaundice, swollen glands
Physical Examination (Template – guide)

The approach to the physical examination will vary with the age of the child. There are special manoeuvres that are done at each age.

General: Describe the state of alertness, mood and willingness to cooperate with the exam and whether the child is in distress. Common observations to make are is this child well or unwell, toxic or not toxic.

Vital Signs: HR: RR: Temp: BP: O2 sats:
Height________________ % Weight________________ % OFC_________%
BMI___________

Hydration: Are there tears? Comment on mucous membranes and skin turgor.

Head: For infants and children feel for the fontanelle; comment on the shape of the head

Eyes: Note presence of the red reflex in all children; check papillary reaction, lids/conjunctiva

NB: Fundoscopic exam is difficulty to perform infants but can usually be done in children over 5-6 years of age; (The examination in this age group provides an excellent opportunity to see the optic disc and vessels).

Ears: Check for tenderness of pinna, discharge and gross assessment of hearing. Check TMs bilaterally.

Nose: Check for discharge, turbinate color

Throat: Check for teeth/caries. Inspect the tongue, buccal mucosal and the posterior pharynx for erythema, enlarged tonsils. Feel for submucous cleft palate in an infant.

Neck: Gently palpate neck for masses and assess range of motion (often by observation)

Lymphatic: Check LN in neck, axilla and groin.

Chest: Observe for signs of respiratory distress (nasal flaring, retractions and grunting). Normal respiratory rate varies with age; percuss for dullness and then auscultate anterior and posterior lung fields (remember the RML) Note the inspiratory: expiratory ratio (I: E ratio). Listen for wheezes and crackles.

Cardiovascular: Observe for cyanosis, respiratory distress and hyperdynamic precordium. Palpate the precordium (for thrills); auscultate as in adults---pediatric heart rates are faster than adults thus distinguishing systole and diastole is more difficult. Many children will have benign murmurs (of no medical importance) ---train your ears to hear them! Palpate the peripheral pulses as in adults. (Femoral pulses are particularly important to feel in neonates when screening for coarctation of the aorta).

Abdomen: observe, auscultate and palpate as in adults. Children often have a palpable liver edge…always palpate from the pelvic brim up. Consider a rectal exam if applicable to presenting complaint.
GU: Observe tanner staging if applicable to presenting complaint. In infants examine to ensure testis are descended.

Musculoskeletal: Much of this portion of the examination is observation for tone and strength. In neonates, observe for increased or decreased tone...both are pathological. When children are older and can follow directions, the approach is similar to an adult exam. There are also special manoeuvres to screen for congenital hip dysplasia (Barlow/Ortolani manoeuvres). Look for joint swelling and rashes.

Neurological: Much of this exam is by observation (especially the CN). Observe for facial symmetry, tongue is midline, there is a strong suck. Children have DTR's just like adults that should be tested. Neonates have primitive reflexes (like an upgoing toe with a Babinski test). If possible observe a child’s gait. Tone and Power can also be mentioned here.

Skin: Look for any rashes, birthmarks etc.

Investigations

List all the investigations done with dates and indicate abnormal results. List all the investigations that are pending.

Impression

In 2 to 3 sentences, provide a summary of the patient with main findings. (1 year old previously healthy Caucasian boy presented to ER with complaint of cough and increased work of breathing. Neither Chest x-ray nor the physical exam showed any focality and the NPW is pending. He has been admitted for likely RSV bronchiolitis and is currently stable on 3 L of oxygen).

Problem List

- List all of the acute and chronic problems using patient descriptions (cough, fever, difficulty breathing). Do not to list diagnosis as the problem i.e. asthma, pneumonia etc.
- List a differential diagnosis for each problem with reasons for and against each diagnosis.
- This list should be in order of significance. There may be problems that were elicited in history which were not part of the presenting symptoms.

Plan

- List all investigations that will need to be followed or need to be done (with reasoning).
- Discuss the management of problems in this patient.
- Write the medications used and the supportive treatment being given.
- Discuss the possible subspecialty and other consults to be done. Make sure to write the question you need to be answered by the subspecialty.
- Plan may be discussed with each problem also.
Do Not Use

Dangerous Abbreviations, Symbols and Dose Designations

The abbreviations, symbols, and dose designations found in this table have been reported as being frequently misinterpreted and involved in harmful medication errors. They should NEVER be used when communicating medication information.

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Intended Meaning</th>
<th>Problem</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>U</td>
<td>unit</td>
<td>Mistaken for “0” (zero), “4” (four), or “cc.”</td>
<td>Use “unit”.</td>
</tr>
<tr>
<td>IU</td>
<td>international unit</td>
<td>Mistaken for “IV” (intravenous) or “10” (ten).</td>
<td>Use “unit”.</td>
</tr>
</tbody>
</table>

**Abbreviations for drug names**

- Misinterpreted because of similar abbreviations for multiple drugs; e.g., MS, MSO₄ (morphine sulphate), MgSO₄ (magnesium sulphate) may be confused for one another.

- Do not abbreviate drug names.

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Intended Meaning</th>
<th>Problem</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>QD</td>
<td>Every day</td>
<td>QD and QOD have been mistaken for each other, or as ‘qid’. The Q has also been misinterpreted as “2” (two).</td>
<td>Use “daily” and “every other day”.</td>
</tr>
<tr>
<td>QOD</td>
<td>Every other day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OD</td>
<td>Every day</td>
<td>Mistaken for “right eye” (OD = oculus dexter).</td>
<td>Use “daily”.</td>
</tr>
<tr>
<td>OS, OD, OU</td>
<td>Left eye, right eye, both eyes</td>
<td>May be confused with one another.</td>
<td>Use “left eye”, “right eye” or “both eyes”.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Intended Meaning</th>
<th>Potential Problem</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>@</td>
<td>at</td>
<td>Mistaken for “2” (two) or “5” (five).</td>
<td>Use “at”.</td>
</tr>
<tr>
<td>&gt;</td>
<td>Greater than</td>
<td>Mistaken for “7”(seven) or the letter “L”. Confused with each other.</td>
<td>Use “greater than”/“more than” or “less than”/“lower than”.</td>
</tr>
<tr>
<td>&lt;</td>
<td>Less than</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dose Designation</th>
<th>Intended Meaning</th>
<th>Potential Problem</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trailing zero</td>
<td>X.0 mg</td>
<td>Decimal point is overlooked resulting in 10-fold dose error.</td>
<td>Never use a zero by itself after a decimal point. Use “X mg”.</td>
</tr>
<tr>
<td>Lack of leading zero</td>
<td>.X mg</td>
<td>Decimal point is overlooked resulting in 10-fold dose error.</td>
<td>Always use a zero before a decimal point. Use “0.X mg”.</td>
</tr>
</tbody>
</table>

Adapted from ISMP’s List of Error-Prone Abbreviations, Symbols, and Dose Designations 2006

Report actual and potential medication errors to ISMP Canada via the web at https://www.ismp-canada.org/err_report.htm or by calling 1-866-54-ISMPC. ISMP Canada guarantees confidentiality of information received and respects the reporter’s wishes as to the level of detail included in publications.

Permission is granted to reproduce material for internal communications with proper attribution. Download from: www.ismp-canada.org/dangerousabbreviations.htm
MINI CLINICAL EXAMINATION

THE CLINICAL PRESENTATION

STUDENT NAME: _______________________________ DATE: __________________

CLINICAL CASE: ________________________________________________________

Student should be provided an assessment of their overall performance as indicated below. The written feedback provided to the student is the most important part of this assessment. Comments are not required under all categories but should be provided where indicated. Only the most exceptional students should be give an “exceeds expectations”.

1. Presents case in an organized and logical manner that allows listeners to follow easily. O

2. At all times displays elements of professionalism such as integrity, respect, empathy, and compassion. O

3. If presenting in front of a patient makes due allowances for the patient’s presence, demonstrating respect and empathy where appropriate. O

4. Identifies the problems. O

5. Establishes the priorities. O

6. Presents relevant, appropriate and accurate material. O

7. Presents in a timely and efficient manner. O

8. Is able to clarify items easily. O

9. Correctly comments on relevant positive and negative findings. O

10. Summarizes thoughtfully. O

OVERALL PERFORMANCE:

DOES NOT MEET REQUIRES MEETS EXCEEDS
EXPECTATIONS IMPROVEMENT EXPECTATIONS EXPECTATIONS

Preceptor / Faculty Name: ________________________________________________

Preceptor / Faculty Signature: ____________________________________________

Student Signature: ______________________________________________________
MINI CLINICAL EXAMINATION

CLINICAL REASONING SKILLS (Part I)

STUDENT NAME: _______________________________ DATE: __________________

CLINICAL CASE: ________________________________________________________

The written feedback provided to the student is the most important part of this assessment. Comments are not required under all categories but should be provided where indicated. Only the most exceptional students should be given an “exceeds expectations”.

DIAGNOSTIC REASONING

1. Appropriately gathers data relating to patient's presenting problem   O

2. Appropriately documents physical findings pertinent to the patient’s problem   O

3. Appropriately orders investigations and / or consultations   O

4. Compiles an appropriately comprehensive differential diagnosis   O

5. Can comment on how the history influences the differential diagnosis   O

6. Demonstrated understanding of how physical findings influence the differential diagnosis   O

7. Comments on how the investigations may influence the differential diagnosis   O

8. Able to arrive at a provisional diagnosis   O
THERAPEUTIC REASONING (Part II)

1. Discusses or shows awareness of the natural history of the disease without treatment  O

2. Identifies appropriate treatment options for the patient  O

3. Provides an analysis of the factors important in making a treatment decision  O

4. Able to comment on the expectations and risks of treatment  O

5. Able to make a decision about the treatment of choice  O

OVERALL PERFORMANCE:

DOES NOT MEET Requires Improvement  Meets Expectations  Exceeds Expectations

Preceptor / Faculty Name: ___________________________

Preceptor / Faculty Signature: _______________________

Student Signature ________________________________
MINI CLINICAL EXAMINATION

GIVING OF INFORMATION / COMMUNICATION SKILLS

STUDENT NAME: _______________________________ DATE: ________________

CLINICAL CASE: ________________________________________________________

The written feedback provided to the student is the most important part of this assessment. Comments are not required under all categories but should be provided where indicated. **Only the most exceptional students should be give an “exceeds expectations”**.

GUIDELINES:

1. Makes appropriate introduction of self and task, establishes rapport, and puts the patient and parent at ease

2. Uses appropriate language that is understandable to the patient at all times, avoiding medical jargon

3. Provides correct information in a logical and organised fashion

4. Reiterates or emphasises important points, clarifying patient’s understanding as appropriate. Allows patient time to comprehend information given and to formulate questions

5. Interrupts only when necessary and uses silence appropriately. Maintains an open posture, respects personal space, makes eye contact and uses appropriate facial expression and speech

6. At all times displays elements of professionalism such as integrity, respect, compassion and empathy

7. Summarizes thoughtfully, and offers written material and provides for additional follow-up when appropriate

OVERALL PERFORMANCE:

<table>
<thead>
<tr>
<th>DOES NOT MEET EXPECTATIONS</th>
<th>REQUIRES IMPROVEMENT</th>
<th>MEETS EXPECTATIONS</th>
<th>EXCEEDS EXPECTATIONS</th>
</tr>
</thead>
</table>

Preceptor / Faculty Name: ________________________________

Preceptor / Faculty Signature: ________________________________

Student Signature: ________________________________________
MINI CLINICAL EXAMINATION
THE FOCUSED HISTORY

STUDENT NAME: _______________________________ DATE: __________________
CLINICAL CASE: ________________________________________________________

The written feedback provided to the student is the most important part of this assessment. Comments are not required under all categories but should be provided where indicated. Only the most exceptional students should be given an “exceeds expectations”.

1. Begins with open ended questioning when appropriate, uses closed ended questions when appropriate to clarify and obtain additional details, and encourages the patient or parent using facilitating techniques. O

___________________________________________________________________________________________

2. Correctly identifies the main presenting complaint, and asks appropriate questions concerning associated symptoms. O

___________________________________________________________________________________________

3. Identifies significant previous medical history. O

___________________________________________________________________________________________

4. Identifies medications, allergies, and immunization history. O

___________________________________________________________________________________________

5. Asks questions regarding development in an age-appropriate manner. O

___________________________________________________________________________________________

6. Identifies significant previous family history. O

___________________________________________________________________________________________

7. Asks questions regarding social history in an age-appropriate manner. O

___________________________________________________________________________________________

8. Takes the history in a logical organized fashion and does not skip elements of the history; no serious omissions noted. O

___________________________________________________________________________________________

9. At all times displays elements of professionalism such as integrity, respect, compassion and empathy. O

___________________________________________________________________________________________

10. Shows ability to prioritize main problem and is not distracted by minor issues; summarizes thoughtfully and clarifies patient’s understanding as necessary. O

___________________________________________________________________________________________

OVERALL PERFORMANCE:

DOES NOT MEET REQUIRE IMPROVEMENT MEETS MEETS EXCEEDS
EXPECTATIONS EXPECTATIONS EXPECTATIONS EXPECTATIONS

Preceptor / Faculty Name: _____________________________________________________________________
Preceptor / Faculty Signature: _________________________________________________________________
Student Signature: ___________________________________________________________________________
MINI CLINICAL EXAMINATION

THE NORMAL NEWBORN EXAMINATION

STUDENT NAME: _______________________________ DATE: __________________

The written feedback provided to the student is the most important part of this assessment. Comments are not required under all categories but should be provided where indicated. Only the most exceptional students should be given an “exceeds expectations”.

1. Makes an appropriate introduction of self and task. O

____________________________________________________________________

2. At all times displays elements of professionalism such as integrity, respect, empathy, and compassion. O

____________________________________________________________________

3. Carries out examination manoeuvres in a logical organised manner. O

____________________________________________________________________

4. Carries out examination manoeuvres in a manner that makes appropriate and efficient use of time. O

____________________________________________________________________

5. Technique is smooth, confident, logical and precise. O

____________________________________________________________________

6. Carries out examination manoeuvres correctly. O

____________________________________________________________________

7. Correctly comments on appropriate negative and positive findings. O

____________________________________________________________________

OVERALL PERFORMANCE:

DOES NOT MEET REQUIRES MEETS EXCEEDS EXPECTATIONS IMPROVEMENT EXPECTATIONS EXPECTATIONS

Preceptor / Faculty Name: ________________________________________________
Preceptor / Faculty Signature: ____________________________________________
Student Signature: ______________________________________________________
MINI CLINICAL EXAMINATION
THE FOCUSED PHYSICAL EXAMINATION

STUDENT NAME: _______________________________ DATE: __________________

SYSTEM EXAMINED: ____________________________________________________

The written feedback provided to the student is the most important part of this assessment.
Comments are not required under all categories but should be provided where indicated. Only the most exceptional students should be given an “exceeds expectations”.

1. Makes an appropriate introduction of self and task.  O
_____________________________________________________________________________

2. At all times displays elements of professionalism such as integrity, respect, empathy, and compassion.  O
_____________________________________________________________________________

3. Appropriately positions, covers and respects the patient throughout the examination.  O
_____________________________________________________________________________

4. Carries out examination manoeuvres in a logical organised manner.  O
_____________________________________________________________________________

5. Carries out examination manoeuvres in a manner that makes appropriate and efficient use of time.  O
_____________________________________________________________________________

6. Technique is smooth, confident, logical and precise.  O
_____________________________________________________________________________

7. Carries out examination manoeuvres correctly.  O
_____________________________________________________________________________

8. Correctly comments on appropriate negative and positive findings.  O
_____________________________________________________________________________

OVERALL PERFORMANCE:

DOES NOT MEET   REQUIRES       MEETS          EXCEEDS
EXPECTATIONS   IMPROVEMENT  EXPECTATIONS  EXPECTATIONS

Preceptor / Faculty Name: ________________________________________________

Preceptor / Faculty Signature: ____________________________________________

Student Signature: _______________________________________________________
MINI CLINICAL EXAMINATION
POWER POINT CASE PRESENTATION

STUDENT NAME: _______________________________ DATE: __________________

CLINICAL CASE: _______________________________________________________

PRESENTED AT: _______________________________________________________

Student should be provided an assessment of their overall performance as indicated below. Guidelines for assessment are provided on the second page of this form. The written feedback provided to the student is the most important part of this assessment. Only the most exceptional presentations should be given an “exceeds expectations”.

GUIDELINES:

1. Provides clear learning objectives at the beginning of the presentation  
   O Yes  O No

2. Quality of case presented  O

______________________________________________________________________

3. Information presented is accurate; demonstrates a depth of knowledge about the topic being presented O

______________________________________________________________________

4. Limits the number of points per slide to 3 to 5; each point should be clear and concise; use of pictures and illustrations where appropriate  O

______________________________________________________________________

5. Presents in a timely and efficient manner  O

______________________________________________________________________

6. Clear, audible, and confident speaking style demonstrating the ability to engage and involve the audience  O

______________________________________________________________________

7. Summarizes case and brings closure, highlights take-home learning points, and provides references  O

______________________________________________________________________

8. Ability to answer questions  O

______________________________________________________________________

OVERALL PERFORMANCE:

<table>
<thead>
<tr>
<th>DOES NOT MEET EXPECTATIONS</th>
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<th>MEETS EXPECTATIONS</th>
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</tr>
</thead>
</table>

____

Preceptor / Faculty Name: _______________________________

Preceptor / Faculty Signature: _______________________________

Student Signature: _______________________________
MINI CLINICAL EXAMINATIONS

The Mini Clinical Examination or Mini CEx

- 10 – 20 minute exercise
- Designed to observe a trainee performing a specific task with a patient and then to provide immediate feedback to the trainee for the purpose of improvement in clinical skills
- Observer can be a faculty member, or a resident/fellow

Objectives

1) To observe a trainee performing the task.
2) To enhance the objective clinical evaluation method of a trainee.
3) To provide instant feedback for the benefit of a trainee.

Method

- Each trainee will be required to hand in a total of 5 Mini CEx forms by the designated due date
- The trainee may select the time/place/patient/observer and the evaluations can be performed at any stage through the rotation
- The CEx forms will be factored into the overall clinical mark
- Each trainee is required to hand in one each of: a focused **history**, a focused **physical examination**, and a **normal newborn examination**. Each trainee may select 2 other tasks from those provided to complete and submit.

  1) An observed focused history*
  2) An observed focused physical examination*
  3) An observed normal newborn examination*
  4) A counselling or information giving session with a patient
  5) A presentation of a clinical case
  6) A presentation of diagnostic and /or therapeutic reasoning skills

* These are a must do three Mini CEX’s. The other 2 can be either of the three.
Procedures Logs & Patient Encounters

**Procedure logs include**

1. MDI plus aero chamber inhalation  
2. Measure newborns head circumference (HC), length (Lt), weight (Wt) and plot on appropriate charts  
3. Measure other age groups HC, Height and Wt and plot on appropriate charts.  
4. Newborn complete exam  
5. Pediatric blood collection  
6. Pediatric immunizations  
7. Pediatric intravenous insertion  
8. Pediatric position oximeter attachment.  
9. Pediatric vital signs – BP/P/RR/T (all ages)  
10. Pediatric vital signs – newborn

**Patient encounters include**

1. Abdominal pain  
2. Anticipatory guidance for all ages (newborn/infant/toddler/adolescent)  
3. APNEA /ALTE  
4. Behaviour disorder  
5. Child Abuse  
6. Dehydration  
7. Developmental delay  
8. Eczema  
9. Failure to thrive  
10. Febrile seizure  
11. Fever  
12. Headache  
13. Hypotonic infant  
14. Ingestion (acute)  
15. Jaundice – neonatal  
16. Lethargic infant  
17. Obesity  
18. Otitis / pharyngitis  
19. Respiratory distress  
20. Urinary tract infection  
21. Vomiting

(Patient encounter can be either a real patient or a simulated patient i.e. CLIPP case).
Progress Notes (SOAP Notes)

Remember, CHARTS ARE LEGAL DOCUMENTS; be careful what you write. Plans should be discussed with the resident or attending before writing in the chart.

Here are a few guidelines you should follow when writing in the chart:

1. Start your note immediately after the last note, so it will be in chronological order.
2. Make sure to write the date and time when note is written.
3. Add an addendum if the patient’s condition suddenly changes during your shift or if significant information becomes available which is relevant for patient care.
4. Do not leave blank lines in between text.
5. If you make a mistake, simply cross out the word with a single horizontal line, write “error” and initial it. Do not scribble out a mistake.
6. Always sign your notes after your printed name and include your pager number and ID number.

Progress notes for admitted patients should be written in a SOAP format.

**S – Subjective**

**O – Objective**

**A – Assessment**

**P – Plan**

**S (Subjective):**

- Information provided by parents / patients about their condition.
  - Get details of the symptoms the patient was admitted with and if symptoms have improved. Example: if the child was admitted with diarrhea – has he had any more loose stools, change in number of stools, colour etc.
  - Is the patient eating better. With an infant you might want to quantify the amount of milk / fluids taken as per mother.
  - Passing urine stools.
O (Objective):

- The information gathered from the physical examination and from the tests.
  - Begin with weight (if new weight available), vitals. If febrile, maximum temperature in last 24 hours.
  - Total input and output – especially in a child admitted with dehydration or with a renal problem. Also important in children not gaining adequate weight due to any reason.
  - Physical examination conducted on that day. Include all pertinent positives and negatives.
  - New laboratory results and other tests done with results i.e, renal ultrasound – normal. Also mention tests already done with pending results.

A (Assessment):

- Assessment of the patient – what you consider the problems with the patient, with the most relevant problem listed first.
- It is also the summary of how the patient is doing and what has changed from previous day.

P (Plan):

- What are the plans for the patient according to each problem.
- Some people like to merge assessment and plan together.
- The most significant problem should be mentioned first.
- This section should include all the medications, lab tests to be ordered and to be followed, consults to be asked.
- It is very important to write the plan after the rounds as most of the decisions are made in the rounds.
MARKS

Marks are based on 3 components:

1. Clinical 40%
   a. End of clerkship assessment scores – 85%
   b. History and physical assignment with critical reasoning essay – 10%
   c. Mini CEX’s – 5%

2. OSCE 25%
   a. Five station OSCE, which will include one history, one physical examination, one counselling session and two other stations. These stations may be an x-ray, picture or critical thinking of information provided.
   b. You will have 1 minute to read the question on the door. You than have 8 minutes to complete the station and you get feedback in the next 2 minutes.
   c. The other stations which include x-rays, pictures etc, you will have 10 minutes for the station and will not receive any feedback on these stations.
   d. You have to be appropriately dressed and have a white coat on.
   e. You have to bring your own stethoscope to the exam.
   f. Any other necessary equipment will be provided.

3. NBME 35%
   a. One hundred multiple choice questions.
   b. Two and half hours to complete.
Useful Links

2. Pediatrics in Review - www.pedsinreview.org (Can access it through UBC library website)
3. CLIPP cases – www.clippcases.org
5. LUMBAR PUNCTURE TECHNIQUE SPECIFIC FOR PEDIATRICS -- http://www.medicalvideos.us/videos-624-Pediatric-Lumbar-puncture
   LUMBAR PUNCTURE GUIDELINES AT BCCH-- http://www.bcchildrens.ca/NR/rdonlyres/6B320898-6521-4FEC-ABE3-9D555B64C6C6/12799/LPs1.pdf

Recommended Textbooks

1. Nelson Essentials of Pediatrics
2. Rudolph’s Fundamentals of Pediatrics
3. Blue prints
4. Pediatric Clerkship – you will be assigned a copy of the Pediatric Clerkship on first day of your Pediatric rotation and it must be returned on the day of NBME.
5. NMS series
The following documents are available from the UBC Pediatrics Website, Undergraduate Program Student Orientation Manual


Asthma .............................................................................................................. 7.1
Croup ................................................................................................................. 7.2
CTU Orientation for Students ................................................................. 7.3
Example of Physicians Order ............................................................. 7.4
Dehydration ................................................................................................... 7.5
Developmental Milestones ......................................................................... 7.6
DKA Protocol .................................................................................................. 7.7
Febrile Seizure ............................................................................................... 7.8
Febrile UTI ...................................................................................................... 7.9
Fever in Infants 0 – 60 days of age ............................................................ 7.10
Fluid and Electrolytes .................................................................................. 7.11
Immunization Schedule 2009 .................................................................... 7.12
Normal Lab Values .......................................................................................... 7.13
Student Schedules – template ................................................................. 7.14
Patient > 1 yr. presents to Emergency Department with 2 previous episodes of wheeze or diagnosis of asthma

Nurse categorizes mild, moderate, moderate severe, severe

Severe Case

Notify Physician Immediately and Exit Pathway
Transfer Patient to Resuscitation Room

Severe

Notify Physician Immediately and Exit Pathway
Transfer Patient to Resuscitation Room

Not a Severe Case

Mild or Moderate Case

Salbutamol * every 20 minutes x 3 doses and Ipratropium ** every 20 minutes x 3 doses in the first hour

Give steroid as per physician orders after first MDI treatment

Physician to re-assess severity and categorize mild, moderate, moderate/severe, severe

Physician to reassess severity and categorize mild, moderate, moderate/severe, severe

Severe

Admit to ERO or hospital

Admit to ERO or hospital

Mild Case

Salbutamol * every 20 minutes x 1-2 doses in the first hour

Reassess after 1 hour

Severe

Physician to re-assess severity and categorize mild, moderate, moderate/severe, severe

Physician to reassess severity and categorize mild, moderate, moderate/severe, severe

Severe

Still tachypneic, decreased air entry, wheezy, indrawing, O2 sats <95% or salbutamol >q4h after 8 hours?

No

Yes

Admit to ERO or hospital

Admit to ERO or hospital

Mild

Air entry improved, no indrawing, no tachypnea O2 sats > 95%?

Yes

Observe for 2 hrs

If stable and no further ER treatment required

Discharge Home
Discharge instructions: See asthma discharge form, Asthma education referral
Follow-up With Primary Care MD Within 3-7 Days

No

Observe for 2 hrs

If okay and no further ER treatment required

Discharge Home
Discharge instructions: See asthma discharge form, Asthma education referral
Follow-up With Primary Care MD Within 3-7 Days

Dose References:

* Salbutamol
5 puffs (<20 kg) or 10 puffs (≥20 kg) via spacer

** Ipratropium
3 puffs (<20 kg) or 6 puffs (≥20 kg) via spacer

Asthma Education Referral Criteria:

- Diagnosis of Asthma
- 18 months of age or older
- Medical team and family aware of referral
- Need to have a BCCH medical record number

BCCH Emergency Management of Asthma Clinical Pathway
Revised: October 28th, 2008
This form is your child's asthma plan and is completed by the doctor. Please follow this plan until you see your family doctor in 3-7 days.

**Reliever/Rescue Inhaler**

Relaxes tight muscles around the airways, starts working within 5 minutes and should last 4 hours. Used daily for a few days when recovering from an asthma attack, then only if needed.

Inhale:
- Salbutamol/Ventolin Metered Dose Inhaler (blue) 100ug (micrograms)
- Other: __________ puff(s) every _______ hours for _______ days then _______ puff(s) every _______ hours as needed

Next due: ________________________________

**Preventer Inhaler**

*Use every day*, reduces swelling and mucous in the airways. Always drink water or rinse mouth with water after each use.

Inhale:
- Fluticasone/Flovent Metered Dose Inhaler (orange) 125ug 250ug
- Fluticasone/Flovent Diskus (orange) 100ug 250ug 500ug
- Budesonide/Pulmicort Turbuhaler (brown) 100ug 200ug 400ug
- Other: __________ puff(s) in the morning and at night until reassessed by your doctor

Next due: ________________________________

**Oral Steroid**

Reduces airway swelling.

Take by mouth:
- Dexamethasone _____ mg(milligrams) by mouth once a day for ______ day(s)
- Prednisone_____ mg by mouth once a day for ______ day(s)

Next due: ________________________________

**Call 911 if your child:**
- has severe trouble breathing, talking, walking, or is feeling dizzy
- has blueness of skin, lips or fingernails

**Go to nearest Emergency if your child:**
- is using the reliever more than every 4 hours
- has hard, fast breathing at rest and has pulling in of skin between the ribs

While waiting for the ambulance or on the way to Emergency, you may give the reliever every 10 minutes as needed.

**Information Handouts:**
- “About Asthma” Pamphlet
- Other Handouts

**Follow Up Appointments:**
- Family Doctor or Pediatrician: ________________________________
- A referral to the Asthma Education Clinic has been made. The clinic will call you. If you have any questions please call 604-875-2345 ext. 7461

_________________________  ____________________________  ____________________________
MD Signature               Date/Time                  Parent/Guardian/Patient’s Signature
This form is your child’s asthma plan and is completed by the doctor. Please follow this plan until you see your family doctor in 3-7 days.

**RELIEVER/RESCUE INHALER**

Relaxes tight muscles around the airways, starts working within 5 minutes and should last 4 hours. Used daily for a few days when recovering from an asthma attack, then only if needed.

<table>
<thead>
<tr>
<th>Inhalation</th>
<th>Dose</th>
<th>Frequency</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>100ug</td>
<td>Salbutamol/Ventolin Metered Dose Inhaler (blue)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

_____ puff(s) every _____ hours for _____ days then _____ puff(s) every _____ hours as needed

Next due: ____________________________

**PREVENTER INHALER**

Use every day, reduces swelling and mucous in the airways. Always drink water or rinse mouth with water after each use.

<table>
<thead>
<tr>
<th>Inhalation</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluticasone/Flovent Metered Dose Inhaler (orange)</td>
<td>125ug, 250ug</td>
</tr>
<tr>
<td>Fluticasone/Flovent Diskus (orange)</td>
<td>100ug, 250ug, 500ug</td>
</tr>
<tr>
<td>Budesonide/Pulmicort Turbuhaler (brown)</td>
<td>100ug, 200ug, 400ug</td>
</tr>
</tbody>
</table>

Other: ____________________________

_____ puff(s) in the morning and at night until reassessed by your doctor

Next due: ____________________________

**ORAL STEROID**

Reduces airway swelling.

<table>
<thead>
<tr>
<th>Take by mouth</th>
<th>Dose</th>
<th>Frequency</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dexamethasone</td>
<td>_____ mg</td>
<td>by mouth once a day for _____ day(s)</td>
<td></td>
</tr>
<tr>
<td>Prednisone</td>
<td>_____ mg</td>
<td>by mouth once a day for _____ day(s)</td>
<td></td>
</tr>
</tbody>
</table>

Next due: ____________________________

CALL 911 IF YOUR CHILD:
- has severe trouble breathing, talking, walking, or is feeling dizzy
- has blueness of skin, lips or fingernails

GO TO NEAREST EMERGENCY IF YOUR CHILD:
- is using the reliever more than every 4 hours
- has hard, fast breathing at rest and has pulling in of skin between the ribs

While waiting for the ambulance or on the way to Emergency, you may give the reliever every 10 minutes as needed.

INFORMATION HANDOUTS:
- “About Asthma” Pamphlet
- Other Handouts

FOLLOW UP APPOINTMENTS:
- Family Doctor or Pediatrician: ____________________________
- A referral to the Asthma Education Clinic has been made. The clinic will call you. If you have any questions please call 604-875-2345 ext. 7461

MD Signature ____________________________ Date/Time ____________________________ Parent/Guardian/Patient’s Signature ____________________________
Health Care Professionals: Please check appropriate device for patient.

### HOW TO USE A PUFFER/MDI (METERED DOSE INHALER) WITH A SPACER AND MASK (UP TO AGE 5 YEARS)

<table>
<thead>
<tr>
<th>Step</th>
<th>Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Take the cap off the puffer (MDI)</td>
</tr>
<tr>
<td>2.</td>
<td>Shake the puffer (MDI) for 30 seconds</td>
</tr>
<tr>
<td>3.</td>
<td>Put the puffer into spacer</td>
</tr>
<tr>
<td>4.</td>
<td>Cover the mouth and nose with mask and seal against face</td>
</tr>
<tr>
<td>5.</td>
<td>Push puffer (MDI) down once</td>
</tr>
<tr>
<td>6.</td>
<td>Hold on face for 5-10 breaths or hold breath for 10 seconds</td>
</tr>
<tr>
<td>7.</td>
<td>Slow deep breaths are best</td>
</tr>
<tr>
<td>8.</td>
<td>For second puff wait 30 seconds and repeat steps 2-7</td>
</tr>
</tbody>
</table>

### HOW TO USE A PUFFER (MDI) WITH A SPACER AND MOUTHPIECE (5 YEARS AND UP)

<table>
<thead>
<tr>
<th>Step</th>
<th>Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Take the cap off the puffer and spacer</td>
</tr>
<tr>
<td>2.</td>
<td>Shake the puffer for 30 seconds</td>
</tr>
<tr>
<td>3.</td>
<td>Put puffer into spacer</td>
</tr>
<tr>
<td>4.</td>
<td>Breathe out</td>
</tr>
<tr>
<td>5.</td>
<td>Seal lips around spacer mouthpiece</td>
</tr>
<tr>
<td>6.</td>
<td>Push puffer down once</td>
</tr>
<tr>
<td>7.</td>
<td>Breathe in slowly and deeply</td>
</tr>
<tr>
<td>8.</td>
<td>Note: if you are using a blue Aerochamber, and you hear a “whistling” sound, you are breathing in too fast!</td>
</tr>
<tr>
<td>9.</td>
<td>Hold breath for 10 seconds (if unable to hold breath, take 5 slow, deep breaths)</td>
</tr>
<tr>
<td>10.</td>
<td>For second puff wait 30 seconds and repeat steps 2 to 9</td>
</tr>
</tbody>
</table>

### HOW TO USE A DISKUS (ABOUT 4 YEARS AND UP)

<table>
<thead>
<tr>
<th>Step</th>
<th>Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Open the Diskus</td>
</tr>
<tr>
<td>2.</td>
<td>Slide the lever to click</td>
</tr>
<tr>
<td>3.</td>
<td>Breathe out, then seal lips around the mouthpiece</td>
</tr>
<tr>
<td>4.</td>
<td>Breathe in deeply and fast</td>
</tr>
<tr>
<td>5.</td>
<td>Hold breath for 10 seconds</td>
</tr>
<tr>
<td>6.</td>
<td>Close the Diskus</td>
</tr>
<tr>
<td>7.</td>
<td>For second dose repeat steps 1-6</td>
</tr>
</tbody>
</table>

### HOW TO USE A TURBUHALER (ABOUT 6 YEARS AND UP)

<table>
<thead>
<tr>
<th>Step</th>
<th>Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Remove cover</td>
</tr>
<tr>
<td>2.</td>
<td>Hold Turbuhaler upright</td>
</tr>
<tr>
<td>3.</td>
<td>Turn the base in one direction and back</td>
</tr>
<tr>
<td>4.</td>
<td>Listen for a “click” sound</td>
</tr>
<tr>
<td>5.</td>
<td>Breathe out away from device</td>
</tr>
<tr>
<td>6.</td>
<td>Place between lips</td>
</tr>
<tr>
<td>7.</td>
<td>Breathe in deeply and quickly</td>
</tr>
<tr>
<td>8.</td>
<td>Hold breath for 10 seconds</td>
</tr>
<tr>
<td>9.</td>
<td>For second dose repeat steps 2-9</td>
</tr>
<tr>
<td>10.</td>
<td>Replace cover</td>
</tr>
</tbody>
</table>
### Emergency Management of Asthma

1 hour after clinical pathway initiated by registered nurse  
(see flowchart overleaf)

1. **Mild Exacerbation**
   - Hold further Salbutamol

2. **Moderate Exacerbation**: administer after first bronchodilator treatment: as per flowchart:
   - Dexamethasone _______ (0.2 mg/kg/dose, max dose 8mg) po x 1 dose
   - Salbutamol 5 puffs (<20 kg) or 10 puffs (≥20 kg) via spacer every 1 hour as required

3. **Moderate/Severe Exacerbation**: administer after first bronchodilator treatment as per flowchart:
   - Dexamethasone _______ (0.2 mg/kg/dose, max dose 8mg) po x 1 dose
   - Salbutamol 5 puffs (<20 kg) or 10 puffs (≥20 kg) via spacer every 1 hour regularly and every 30 minutes as required

4. **Other Medications**:

5. **Discharge Instructions**:
   - Spacer and medication teaching
   - Asthma discharge instruction sheet reviewed
   - Asthma Education referral

---

**Signature:** ___________________________  **Pager #:** __________________

**Print Name:** _________________________  **College ID#:** ________________

**Date:** _________________  **Page 1 of 2**
Rectal Temp ≥ 38°C

Focal Infection? Yes → Treat as appropriate to site and severity

No

Toxic? Yes

High risk? Yes

≤ 30 Days?

Yes

CBC, Blood Culture
Urinalysis and urine culture
Consider LP
Consider NPW
Consider CXR

Admit
CBC, Blood Culture
Urinalysis and urine culture
LP when stable
Consider NPW
Consider CXR
Start IV antibiotics (within 1 hour of physician assessment)
Fluid resuscitation

No

Admit for IV Antibiotics

Investigations Abnormal?

Yes

No

- Reliable follow-up?
- Able to communicate with family?
- Adequate caregiver education?
- Drinking well?

Yes

Consider IV or IM Ceftriaxone
Arrange follow-up within 24 hrs.
Discharge

No

- Admit for observation
- Consider IV or IM Ceftriaxone
- Fluid resuscitation if required
START

Toxic?
- Lethargy
- Poor eye contact
- Poor perfusion
- Hypo/hyperventilation
- Cyanosis

Yes → SBI Risk for a Toxic Infant 17.3% (8 – 30%) (Baraff 1993 [E])

No → High Risk Factors?

Clinical
1. History of prematurity (<37 wks)
2. Perinatal antibiotics
3. Treated for unexplained jaundice
4. History of previous rehospitalization
5. Chronic or underlying illness
6. Not discharged with mother
7. Intrapartum history of mother for fever, Group B streptococcus, or antibiotic treatment

Yes → SBI Risk for a High Risk Infant 8.6% (3.7 – 15.6%) (Baraff 1993 [E])

Investigations (abnormal)
1. WBC <5,000/µl or 15,000/µl
2. Bands >1,500/µl
3. Urine >10 WBC/hpf (sterile catch); positive nitrites
4. CSF abnormal (if obtained)
5. If diarrhea present: >5 WBC/hpf in stool

Yes → SBI Risk for a Toxic Infant 17.3% (8 – 30%) (Baraff 1993 [E])

Antibiotic Therapy

**Inpatient (0 – 30 days)**
- Ampicillin/Gentamicin
- Or
- Ampicillin/Cefotoxime

**Inpatient (31 – 60 Days)**
- Cefotoxime (high risk)
- Or
- Ceftriaxone (low risk)

**Outpatient (31 – 60 Days)**
- Ceftriaxone

Page 2 of 2
Transcribed: October 09, 2008
ALGORITHM: CROUP IN THE EMERGENCY DEPARTMENT

DIAGNOSIS OF CROUP
Abrupt onset of coarse, barky cough +/- inspiratory stridor

Give oral dexamethasone 0.6mg/kg to a max dose of 10mg
Oral dexamethasone is well tolerated when given as the parenteral-injectable preparation mixed with flavoured syrup.

MILD
(without stridor or significant chest wall indrawing at rest)

Educate parents:
- Anticipated course of illness
- Signs of respiratory distress
- When to seek medical care

May discharge home without further observation

Patient improves and no longer has:
- Chest wall indrawing
- Stridor at rest
Educate parents (as for mild croup)
Discharge home

MODERATE
(stridor and chest wall indrawing at rest without agitation)

- Minimize intervention
- Place child on parent’s lap
- Provide position of comfort

Consider nebulized L-epinephrine 1:1000 (5ml)

Observe for improvement
(Must observe for minimum of 2 hrs post –epinephrine, if given)

No or minimal improvement by 4 hours: Consider hospitalization (see below)

SEVERE
(stridor and indrawing of the sternum associated with agitation or lethargy)

- Minimize intervention (as for moderate croup)
- Provide blow-by oxygen (optional unless cyanosis present)

- Nebulize L-epinephrine 1:1000 (5ml)
- If vomiting, consider budesonide (2mg) nebulized with epinephrine

Poor response to nebulized epinephrine

Contact pediatric ICU for further management

Consider hospitalization (general ward) if:
- Received steroid > 4 hours ago
- Continued moderate respiratory distress (without agitation or lethargy)
- If recurrent severe episodes of agitation or lethargy, contact pediatric ICU

Recurrence of severe resp distress:
- Repeat nebulized epinephrine
- If good response, continue to observe
BC Children’s Hospital
Division of Pediatric Emergency Medicine
Clinical Practice Guidelines

DIAGNOSIS AND MANAGEMENT OF CROUP

AUTHORS*:
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Division of Pediatric Emergency Medicine
Department of Pediatrics, University of British Columbia
BC Children’s Hospital
4480 Oak Street
Vancouver, British Columbia
Canada V6H 3V4

CLINICAL PRACTICE GUIDELINE TASK FORCE:

CHAIRMAN: Paul Korn. MD FRCP(C)
Clinical Associate Professor
Head, Division, General Pediatrics
Department of Pediatrics, UBC

MEMBERS: TBD

*Adapted from Alberta Clinical Practice Guideline, March 2003

CREATED: September, 2007
LAST UPDATED: September 20, 2007
FIGURES: 1
KEY POINTS:

1. Croup is a common respiratory tract infection characterized by sudden onset of a coarse, barky cough and often accompanied by inspiratory stridor.
2. Diagnosis is based on clinical presentation.
3. Early administration of oral dexamethasone is the mainstay of treatment, even in mild croup.
4. Nebulized epinephrine is indicated for symptom management in moderate to severe croup.

Croup is a self-limited respiratory illness of childhood caused by a number of different viruses. It most commonly occurs in autumn and winter. It is characterized by the abrupt onset of a seal-like barky cough and is often accompanied by inspiratory stridor, hoarseness and varying degrees of chest wall indrawing. Fever and upper respiratory tract symptoms may also be present. Children with croup should not drool or appear toxic.

Features suggesting an alternative diagnosis:
- High fever, toxic appearance and poor response to nebulized epinephrine suggest bacterial tracheitis.
- Sudden onset of symptoms with high fever, stridor, drooling, sniffling position and absence of barky cough suggest epiglottitis.
- Other potential causes of inspiratory stridor include foreign body lodged in the upper esophagus, retropharyngeal abscess and hereditary angioedema.

Investigations:
Most children with croup can be diagnosed based on the clinical presentation coupled with a thorough history and physical exam. The vast majority of children do not require radiographs or blood work. Anterioposterior (AP) and lateral radiographs of the soft tissues of the neck may be helpful in clarifying the diagnosis in children with an atypical history or who do not respond to treatment.

Cone-shaped narrowing of the subglottic area (steeple sign) is suggestive of croup but may be absent in up to 50% to 60% of cases.

Emergency Department Care: (for drug dosages, see algorithm)

➢ Make child with comfortable. Often this is achieved by keeping the child in the parent’s arms. Avoid agitating the child with unnecessary procedures.
Apply blow-by oxygen to children in respiratory distress.
Children with moderate to severe symptoms (stridor at rest) should be monitored by pulse oximetry.
Administer nebulized epinephrine to patients in severe respiratory distress (chest wall retraction with agitation or lethargy) \(^3,4\)
Administer one oral dose of dexamethasone to all children diagnosed with croup \(^5\). Consider nebulized budesonide in children who are too sick to tolerate oral medications. Although budesonide is just as effective as dexamethasone, it is considerably more expensive and should be reserved for children who can not tolerate oral medications.
Mist tents, wanes, or steamers are not effective and should not be used \(^6\).
Antibiotics, sedatives and oral decongestants are not recommended.

Hospital Admission

Admit children with significant respiratory distress (sternal wall indrawing, stridor at rest) persisting 4 or more hours after corticosteroid administration.
Consider admission if there is significant parental anxiety, if the child has been brought to the hospital repeatedly for croup symptoms, if the family lives a long distance from the hospital or has inadequate transportation, or if there are concerns about the adequacy of follow-up.
Children admitted to hospital require close monitoring of their respiratory status. Administer epinephrine if severe respiratory distress reoccurs. Contact the closest pediatric intensive care unit if epinephrine is administered more than every 2 hours.

Complications

A small number of hospitalized patients may require intubation.
Cardiopulmonary arrest can occur in patients who are not adequately monitored and managed.
Bacterial tracheitis can cause a sudden deterioration.
Pneumonia is a rare complication.

Discharge

Most children can be managed as outpatients. Children can be safely discharged home if they have not been treated with epinephrine in the past four hours, they do not have stridor at rest, they do not have significant chest wall indrawing and the parent or caregiver can easily return to hospital if the symptoms recur at home.
Provide parents/caregivers with written instructions and provide advice on when to return for medical care.
No specific follow-up is required for most children with croup. Patients who have had stridor for >1 week should follow-up with their primary care provider.
References

Other Sources

BC Children’s Emergency - www.bcch.bc.ca

General References


Cited References

Welcome to your rotation on the Clinical Teaching Units! We hope that you will have a great experience. The information provided below is to help you settle into the ward and to help ensure you have a positive learning experience.

The goals for your month are:

1. Recognize the clinical presentation and course of common pediatric conditions
2. Become comfortable caring for pediatric patients and their families
3. Learn history taking, physical examination, and communication skills
4. Learn how to make clinical decisions based on evidence
5. Function effectively in a team setting

The Wards

Patients admitted to CTU are admitted either to the Green Team or the Blue Team. Each team manages up to 16 patients at any one time. The Green Team will manage patients on 3M and 3F. In addition to General Pediatrics patients, the team will look after subspecialty patients from Infectious Disease, Gastroenterology, Nephrology, Endocrine and Metabolics. The Blue Team will manage patients on 3M and 3R. In addition to General Pediatrics patients, the team will look after subspecialty patients from Cardiology, Hematology, Rheumatology, and Neurology. Usually there will be a maximum of two patients from each subspecialty service at any one time in order to promote a diversity of diagnoses.
The Teams

The teams are comprised of:

Supervising Pediatrician:

Patients will be admitted under either the Blue or Green Team supervising pediatrician unless the child has a pediatrician who follows the child on a regular basis as an outpatient and who has privileges at the hospital. The supervising pediatrician's role is to support the team. He or she will accompany ward rounds. They will provide bedside teaching. They will meet with the senior resident on a daily basis to review all patients. They will provide an evaluation for all the members of the team at the end of the rotation.

Senior Resident:

The senior resident (3rd or 4th year pediatric resident) is the team leader and must have a detailed knowledge of all patients on the service. The senior resident will run the ward rounds and will be responsible for arranging and supporting all academic rounds. The senior resident will be organizing all admissions to the team.

Junior Resident:

The junior resident (1st or 2nd year pediatric resident) (2 or 3 per team) will be responsible for directly managing all patients on the team under the direction of the senior resident, supervising pediatrician and attending pediatrician. The junior resident's each manage ~ 6-8 patients and co-manage these with the medical students. All patients admitted to the team will have an assigned junior resident.

Medical Students:

Each of you should carry ~ 4 patients. You are expected to co-manage your patient with the junior resident assigned to that patient. Please discuss all aspects of your patient's care with the junior resident. If you receive information from investigations or consultants, please ensure this is communicated to the junior resident in a timely fashion.

Your Role on the Team

You are a critical member of the team and very often the team member your patient and their family sees the most.
Morning Handover

Handover is at 0730 sharp. Please be on time. All patients on the team should be assigned a medical student. It is the responsibility of the medical students on the team to divide the patients amongst yourselves evenly to ensure all patients are seen by a medical student every morning before rounds. On occasion, one student may have more or less patients depending on the timing of discharges and admissions. Strive to maintain continuity with your patients that you have admitted. On Monday and Wednesday mornings, residents are at morning report and will not be on the ward until 0800.

Morning Work Rounds

Between 0730-0900, it is your responsibility to see and to do a focused physical examination on all of your assigned patients. Gather information regarding pertinent vitals, medications, pending labs, pending consults and have this information ready to present at rounds. It is important to check the nursing clipboard hanging beside the doors to each room. They contain plots of the patient’s vital signs and current weight, a record of ‘ins and outs’ and nursing progress notes (take the time to read the nursing notes!). The patient’s chart will contain any new orders and/or progress notes written by the on-call team during the night. You should try to find the result of any labs that were pending the previous day. The most important thing to do before rounds is to assess the patient. Many patients are sleeping and understandably you may feel badly waking them but it is very important that you do your focused physical examination so you can bring to rounds the information needed for the team to make a plan for the day. Ask the patient or his/her parent about any changes in the patient’s condition overnight and perform a focused physical examination. Accomplishing the above can be challenging and is a time management skill you will find you get better at as the rotation progresses. Rounds begin at 0900 promptly.

Ward Rounds

Rounds format will vary depending on the preference of your team. Generally rounds are done at the bedside and involve the family. You are responsible to present your patients. This is a learning experience in medical communication. Communicating information concisely and efficiently is a key skill in medicine and the resident’s will help you with this. New admissions need to be presented to the team in more detail than a patient known to the team but should not be presented word for word from your admission history and physical. On call you presented in detail to the resident you were working with. At morning rounds, your job is to present the pertinent aspects of the history and physical so that your team gets a good impression of the child you admitted and what the plan was. Again this takes practice but is a skill well worth learning. Children known to the team can be presented in less detail.
Notes

You are responsible to write a complete history and physical note including your impression and plan for each patient you admit. You are also responsible for writing a progress note (SOAP format) on each of your patients. Do not write this note before morning rounds as plans often change during rounds and pertinent investigations and consults for the day are often not back. Do not write this note during morning rounds as this is time for learning from other patients. Notes should be written by 1500 to ensure that the junior resident's have a chance to review your note and make any amendments they see fit. On straightforward patients, junior resident's may co-sign your note. On complex patients, junior resident's may write an additional note. Please remember that medical documentation is an extremely important part of our jobs. Make sure your notes are clear, legible and being co-signed. Friday notes should detail the plan for the weekend. As a courtesy to the on-call team, who does not know your patient, all anticipated weekend discharges should have discharge paperwork and plans completed by Friday.

Orders

You may and should write orders in the chart. Please make sure your orders are written according to safe prescribing hospital practice (see back of order sheet for details). Ensure your order is checked and co-signed by a resident. X-rays ordered need to be ordered on the blue order pages and have a yellow radiology requisition filled out. Consults ordered need to be ordered on the blue order pages and have a pink edged consult requisition filled out. On your consult, make your question to the consulting service clear and include your name and pager number. Either yourself or the junior resident will call the consulting service. If you call the service and discuss the consult, please document on the requisition that the service is aware.

Discharge Summaries / Dictations

Each patient discharged from the ward has a sheet filled out which briefly summarizes their hospital stay. This is your responsibility. As most discharges are anticipated the day before, strive to have your patient's discharge paperwork ready the night before to aid in a quick discharge in the morning. This is extremely helpful for bed issues in the hospital. You are not responsible for dictated summaries. These are the responsibility of the junior resident. We are a large institution and it is important that we effectively communicate with the medical community following our patients outside of the hospital. Family physicians / Pediatricians who regularly follow the children we have admitted should be called to be made aware of the admission and the discharge plan.
**Evening Handover**

Evening handover is at 1700 every day except Tuesday when it is at 1600. This is meant to highlight to the covering team who your patient is and what issues they might expect to have arise overnight. Ensure the patient list is updated to reflect current patient status and any concerns.

**Admissions**

The majority of children admitted to the CTU will present initially to the ER. The pediatric ER physician generally decides if a child requires admission and will contact the senior resident. On occasions, patients may be transferred directly from the PICU, another ward, or another hospital. The senior resident is responsible for the initial evaluation and when required may write holding orders before a complete assessment is undertaken. The senior resident will call either you or a junior resident to take a full history and physical. You will be responsible to present your admission to the junior or senior resident. The plan will be reviewed and teaching around the case will be done. If at any time during your admission, you are worried about your patient’s status, please call the senior resident immediately.

**Call**

You are scheduled on call 1 in 4. When on call you will be first call on the ward for issues with your team’s patients and you will be called by the senior resident to participate in admissions from the ER. Please answer your pager promptly. All ward calls must be discussed with the junior resident with whom you are on call. If the situation permits, you are expected to attend to the ward first, assess the situation, come up with a plan and then call the junior resident to review the call. If the situation seems urgent, page the junior resident to attend with you. The resident’s are always happy to hear about ward issues that you have been called about and it is important for safety and continuity that they are made aware of all calls. Post-call medical students may leave after attending ward rounds and writing their progress notes. Issues that need to be followed up for the day should be handed over to the junior resident co-managing the patient with you.
**Teaching Rounds**

Bedside teaching will be arranged by the supervising pediatrician or the teaching fellow. You will receive an email letting you know when you are scheduled.

**Monday**

0730  Morning Handover

0900  Ward Rounds

1400  Nephrology Teaching  3M Conference Room

1700  Evening Handover

**Tuesday**

0730  Morning Handover

0900  Ward Rounds

1230-1600  Resident Academic Half Day (3D16) (students to report to attending for admissions / ward concerns)

1600  Evening Handover (immediately after resident half day)

**Wednesday**

0730  Morning Handover

0900  Ward Rounds

1500  Teaching Fellow Session (3F Conference Rm)

1700  Evening handover

**Thursday**

0730  Morning Handover

0830-0900  Cardiology Teaching Rounds (Blue Team) (3M)

1030  Nephrology Teaching Rounds (Green Team) (3F Conference Rm)

1230-1600  Medical Student Academic Half Day (3D16) (CTU MSI’s to return to ward at 1600)

1700  Evening Handover
Friday

0730  Morning Handover

0830-0930 Grand Rounds (Chan Center)

0930  Ward Rounds

1200-1300 Advances in Pediatrics (3D16, lunch provided)

1700  Evening Handover

Saturday, Sunday, Holidays

0845  Morning Handover (post-call team to assist in morning rounds)

Frequently Asked Questions:

1. **How do I find out what medications my patient is on or when they receive their medications?**

   The best place to find that info is on the MAR (medical administration record). Each nurse will have their own clipboard containing the MAR for the patients they are following that day. The nurse for each patient changes each shift, but is always listed on the white board. These clipboards are usually located in the med room and contain information regarding which medications, what dose and when. It's a great place to find out whether or not your asthmatic patient needs the prn Ventolin's you ordered and when they last received a Ventolin.

2. **Where do I sleep when I am on call?**

   The call rooms are located on the 1st floor in Shaugnessy. The room number is A112. The code to get in the main door is 7531#, and the code for the individual rooms (Rooms 1, 2, or 3) is 2531#. Lockers will be located here. Please don't leave valuables unattended here!

3. **How do I use the phone?**

   Calling within the hospital: dial the 4-digit local number

   Calling outside the hospital: dial 9 first

   Paging: dial 410 followed by the 4-digit pager number, enter the 4-digit local of the phone you are at and wait for your call to be returned
Calling long distance: ask the unit clerk for a “special” number

Hospital Paging: 2161, you can ask them for any local or to page someone directly

Faxing: ask the unit clerk

Questions:

Dr. Mumtaz Virji
Undergraduate Program Director
Pager # 604-877-2813
<table>
<thead>
<tr>
<th>Time</th>
<th>MONDAY</th>
<th>TUESDAY</th>
<th>WEDNESDAY</th>
<th>THURSDAY</th>
<th>FRIDAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>07:15</td>
<td>Team Handover</td>
<td></td>
<td>Team Handover</td>
<td>Team Handover</td>
<td></td>
</tr>
<tr>
<td>07:30</td>
<td></td>
<td>Team Handover</td>
<td>Morning Report</td>
<td>Team Handover</td>
<td>Team Handover</td>
</tr>
<tr>
<td>08:00</td>
<td></td>
<td></td>
<td>(Residents only)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>08:30</td>
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<tr>
<td>09:00</td>
<td>Rounds</td>
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<td>Rounds</td>
<td>Rounds</td>
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<tr>
<td>09:30</td>
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<td>10:00</td>
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<td>10:30</td>
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<td>11:00</td>
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<td>11:30</td>
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<tr>
<td>12:00</td>
<td></td>
<td></td>
<td></td>
<td>11:00am Cardiology</td>
<td></td>
</tr>
<tr>
<td>12:30</td>
<td></td>
<td></td>
<td></td>
<td>Teaching (Blue team)</td>
<td>Advances in Pediatrics</td>
</tr>
<tr>
<td>01:15</td>
<td>Developmental Rounds</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01:30</td>
<td>Nephrology</td>
<td>Resident</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>02:00</td>
<td>Teaching (Green Team)</td>
<td>Half Day</td>
<td></td>
<td></td>
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<tr>
<td>02:30</td>
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<td>03:00</td>
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<td>03:30</td>
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<td>04:00</td>
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<td>04:30</td>
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<tr>
<td>05:00</td>
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<td></td>
<td></td>
<td></td>
<td>Evening Handover</td>
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<tr>
<td>05:30</td>
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</tr>
<tr>
<td>06:00</td>
<td>Evening Handover</td>
<td>Evening Handover</td>
<td>Evening Handover</td>
<td>Evening Handover</td>
<td></td>
</tr>
</tbody>
</table>

* Developmental Rounds third Thursday each month
Since July 2009, Pediatric residents have been covering CTU call schedule with a night float system. This means that 1 team covers Day shifts (7am-7pm) and another team covers nights. The feedback from the residents have been very positive so far, resulting in improved continuity of care of the patients, increased patient safety and a better learning opportunity for residents. Residents are being able to attend all daily/weekly teaching rounds and this means the whole team is present on the ward and available throughout the week.

Starting April 2010, medical students doing CTU at BCCH will be adopting the night float system. The purpose is to provide similar positive effects as with the residents found. The plan is for students to have 5 night calls, one Saturday 24 hours call and one Sunday day call. Due to orientation and exams it will not be possible to have all students do the above; there will be some adjustments for a couple of students per rotation.

Details:
1. Handover times 18:00 - 07:30, Sunday night through Thursday night (same as residents).
2. CTU night team responsibilities include:
   a. To shadow the residents and work alongside with them.
   b. Admissions overnight
   c. Active management of patients overnight (with residents) with appropriate documentation in patients charts reflecting this management.
   d. Preparation of discharge instructions and prescriptions
3. Students doing night float must get an evaluation form filled out by their senior resident (the one they work most with, in most cases that is 5 nights).
4. At anytime when dealing with a problem, if you are unsure or concerned about the patient, **page the resident immediately**. Always inform the resident of any problems - small or big.

This is a big change, the clerkship director (Dr. Mumtaz Virji) will closely monitor this new model and would appreciate any feedback the students have. You will be receiving a survey form at the end of your CTU rotation; this will help us make the final decision about night float (remember this is work in progress).

If you have any concerns at anytime, please feel free to contact Dr. Virji. Her email address is mvirji2@cw.bc.ca

July 2011
A New Approach to Medication Reconciliation on Admission

Listening and making improvements to streamline work with a focus on patient safety

Summer 2009
A New Approach to Medication Reconciliation on Admission

What are we trying to improve?

**Goal** is to reduce medication errors by 95% related to inconsistency of home to hospital medications resulting in:

- Omission of home medications
- Incorrect dosages
- Contraindications with in-hospital treatments/medications

What is different this time?

Collaborative approach to medication reconciliation on admission which includes:

- **Team approach:** Input from medicine, surgery, pharmacy & nursing on development of process
- **Streamlining work:** New form combines medication history and physician orders for continuation or discontinuation of *home medications, over-the counter medications and complementary and alternative medications*
- **Roll-out:** 1 week blitz for first week in July which will include coverage of medicine, nursing, unit clerks and pharmacy
# A New Approach to Medication Reconciliation on Admission

## Roles & responsibilities

### Pediatric Medicine: Admitting Physician (Attending or Trainee)

- Obtain patient’s medication history through most reliable source
- Record medications on Medication History & Order Form on Admission (No need to document in admission history as well)
- Complete order component of medication history list
- Complete further admission orders on Physician’s Order sheet
- Communicate new orders to nursing unit clerk and/or nurse caring for patient

### Pediatric Surgical: Admitting Surgeon (Attending or Trainee)

- **Patient’s admitted day of procedure:**
  - Medication history list will be taken by SDCU or Pre-admit Clinic nurse
  - Verify list
  - Complete order component of medication history list
  - Complete further admission orders on Physician’s order sheet
  - Communicate new orders to nursing unit clerk and/or nurse caring for patient

- **ER or direct admits to surgical service:**
  - Obtain patient’s medication history through most reliable source
  - Record medications on Medication History & Order Form on Admission
  - Complete order component of medication history list
  - Complete further admission orders on Physician’s Order sheet
  - Communicate new orders to nursing unit clerk and/or nurse caring for patient

### Nursing, Unit Clerks, Pharmacy

- Nursing to verify medication history list
- Nursing or unit clerks to process continue orders (includes recording of medication order on MAR, scanning order to pharmacy)
- Pharmacy to process order
Medication History

- Indicate patient’s weight, height & if applicable, BSA
- Indicate with a check mark (✓) patient’s allergy status. If any, document all allergies & reactions on the Caution Sheet.
- Indicate with a check mark (✓) if the patient has NO home prescription, over-the-counter or complementary alternative medications.

Complete date and time that you obtained medication history. Place a check mark (✓) in the Prescriber box. And sign the signature line.

Draw a line through admit med history list and order form area to prevent further documentation.
**Medication History**

- Indicate patient's weight, height & if applicable, BSA.
- Indicate with a check mark (✓) patient's allergy status. If any, document all allergies & reactions on the Caution Sheet.
- Complete date and time that you obtained medication history. Place a check mark (✓) in the Prescriber box.
- Record all home medications the patient is taking including prescriptions, over-the-counter meds and complementary alternative medications. Record their names, dose, route & frequency.
- If available, record last dose date & time patient received the home medication.
- Once history is recorded, draw a line through the empty spaces to prevent new orders being written here.
- Unless the patient’s complementary alternative meds is part of the pt’s medical regimen approved by their attending, STOP these meds. Can be discussed later during stay.

**Medication Order**

- Indicate with a check mark (✓) whether you wish to stop or continue the medication. In this example, the furosemide & digoxin were stopped as the decision was made to change the dosage on admission. The new digoxin and furosemide orders were written on the remainder of the admission orders.
- If available, record last dose date & time patient received the home medication.
- As you have now completed an order, complete the requirements for prescribers.
What are the benefits to this new approach?

**#1 Patient Safety:**
- focuses on home prescriptions, over-the-counter and complementary alternative medications
- separates home medication history from remainder of admission history for easy reference throughout patient stay and for discharge
- decreasing transcription error if home medications are continued. In previous system, home medications to be continued were rewritten from history onto physician’s orders.

**#2 Decreasing Amount of Rework:**
- medication history on admission can be written in one spot within the chart for easy reference – agreement by physician leaders that medication history does not need to be included in the initial patient history documentation on the Physician Notes
- orders do not need to be written on Physician's Order sheet if they are to be continued as taken at home
- medication history on admission easily referred to throughout stay
A New Approach to Medication Reconciliation on Admission

How will know we have made an improvement?

Comparisons of previous medication reconciliation audits with ongoing compliance and accuracy audits of new process.
A New Approach to Medication Reconciliation on Admission

Comments regarding the design and usability of the Medication History & Order Form on Admission:
• Tracie Northway  L. 2092  tnorthway@cw.bc.ca

Program specific contacts regarding patient specific medication safety:
• Oncology Program – Kira Cooksley
• 3M/3F – Cathy Madayag
• 3R – Laurie Johnson
• Emergency – Denise Hudson
• PICU – Tracie Northway
• Sunnyhill Health Center – Rita Janke
• Mental Health – Dean Elbe
Med Rec is a legal form used to replace multiple location charting on medications. All areas previously used to record medications can have a reference made to "see med rec" - to avoid duplicate charting.

**BCCH - Current Medications & Reconciliation At Admission**

**Date:** ____________  **Time:** ____________

**Weight:** _______________ kg  **Height:** _______________

**Allergies:**
- [ ] See Food & Drug Allergy "CAUTION" Form
- [ ] No Known Allergies

[ ] No Current Medications  **Signature:** ______________________

**These ARE NOT Physician's Orders**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
<th>Route</th>
<th>Frequency</th>
<th>Home Schedule:</th>
<th>Date Med Started:</th>
<th>Reason Med Started:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**List of Current Medications**

List all prescription; investigational, sample drugs AND all relevant over-the-counter products.

**Med Info Source**


**Medication Information Collected and/or Documented by:**

<table>
<thead>
<tr>
<th>Current Med List</th>
<th>Printed Name:</th>
<th>Initials:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescriber</td>
<td>Printed Name:</td>
<td>Initials:</td>
</tr>
<tr>
<td>Reconciled</td>
<td>Printed Name:</td>
<td>Initials:</td>
</tr>
</tbody>
</table>

**PRESERVER USE ONLY**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
<th>Route</th>
<th>Frequency</th>
<th>Home Schedule:</th>
<th>Date Med Started:</th>
<th>Reason Med Started:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Date & Time of Last Dose**

**Initials**

- [ ] Continue
- [ ] Discontinue

**Changes with Indications**

**Initials**

**Reconciled By**

**Date, Time & Initials**

- [ ] Medical Specialist Consult Required See Physician's Orders

This section is for PHYSICIANS (Residents / MSIs): Indicate immediate plan for "current medications" at admission, by marking the appropriate column and writing indication for change.

Follow Safe Prescribing Guidelines

This section is for NURSES to indicate when meds are reconciled (checked) against the order sheet - making sure continued meds are ordered.

To be used to indicate medical involvement with surgical patients

*Use to indicate source(s) of info

*Use to indicate # or pages used

*Identify each contributor to the list and initial the form!!

Document all allergies & reactions on the Food & Drug Allergy Form

Med Rec Forms will be housed in the front of the physician order section

File form in front of Physician's Orders

Addressograph Here

List of Current Medications

PRESCRIBER USE ONLY
The abbreviations, symbols, and dose designations found in this table have been reported as being frequently misinterpreted and involved in harmful medication errors. They should NEVER be used when communicating medication information.

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Intended Meaning</th>
<th>Problem</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>U</td>
<td>unit</td>
<td>Mistaken for “0” (zero), “4” (four), or cc.</td>
<td>Use “unit”.</td>
</tr>
<tr>
<td>IU</td>
<td>international unit</td>
<td>Mistaken for “IV” (intravenous) or “10” (ten).</td>
<td>Use “unit”.</td>
</tr>
<tr>
<td>Abbreviations for drug names</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QD</td>
<td>Every day</td>
<td>QD and QOD have been mistaken for each other, or as ‘qid’. The Q has also been misinterpreted as “2” (two).</td>
<td>Use “daily” and “every other day”.</td>
</tr>
<tr>
<td>QOD</td>
<td>Every other day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OD</td>
<td>Every day</td>
<td>Mistaken for “right eye” (OD = oculus dexter).</td>
<td>Use “daily”.</td>
</tr>
<tr>
<td>OS, OD, OU</td>
<td>Left eye, right eye, both eyes</td>
<td>May be confused with one another.</td>
<td>Use “left eye”, “right eye” or “both eyes”.</td>
</tr>
<tr>
<td>D/C</td>
<td>Discharge</td>
<td>Interpreted as “discontinue whatever medications follow” (typically discharge medications).</td>
<td>Use “discharge”.</td>
</tr>
<tr>
<td>cc</td>
<td>cubic centimetre</td>
<td>Mistaken for “u” (units).</td>
<td>Use “mL” or “millilitre”.</td>
</tr>
<tr>
<td>µg</td>
<td>microgram</td>
<td>Mistaken for “mg” (milligram) resulting in one thousand-fold overdose.</td>
<td>Use “mcg”.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Intended Meaning</th>
<th>Potential Problem</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>@</td>
<td>at</td>
<td>Mistaken for “2” (two) or “5” (five).</td>
<td>Use “at”.</td>
</tr>
<tr>
<td>&gt;</td>
<td>Greater than</td>
<td>Mistaken for “7”(seven) or the letter “L” . Confused with each other.</td>
<td>Use “greater than”/“more than” or “less than”/“lower than”.</td>
</tr>
<tr>
<td>&lt;</td>
<td>Less than</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dose Designation</th>
<th>Intended Meaning</th>
<th>Potential Problem</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trailing zero</td>
<td>$.0 mg</td>
<td>Decimal point is overlooked resulting in 10-fold dose error.</td>
<td>Never use a zero by itself after a decimal point. Use “.mg”.</td>
</tr>
<tr>
<td>Lack of leading zero</td>
<td>$.mg</td>
<td>Decimal point is overlooked resulting in 10-fold dose error.</td>
<td>Always use a zero before a decimal point. Use “0,.mg”.</td>
</tr>
</tbody>
</table>

Report actual and potential medication errors to ISMP Canada via the web at https://www.ismp-canada.org/err_report.htm or by calling 1-866-54-ISMPC. ISMP Canada guarantees confidentiality of information received and respects the reporter’s wishes as to the level of detail included in publications.

Permission is granted to reproduce material for internal communications with proper attribution. Download from: www.ismp-canada.org/dangerousabbreviations.htm
Emergency Management of Dehydration

Patient presenting to ED with vomiting and/or diarrhea

LOU 1 or 2
OR severe dehydation

RN assigns Level of Urgency (LOU); and Evaluates level of dehydration: Mild, Moderate or Severe

Level 3, 4, 5
RN establishes eligibility for ORT clinical pathway

EXCLUSION CRITERIA:
- Age less than 6 months;
- Language barrier;
- Clinical signs of severe dehydations (see table 2);
- Persistent moderate abdominal pain (4/10), distension and rigidity;
- Bloody stools or emesis;
- Bilious vomiting;
- Altered LOC;
- Chronic health conditions such as: GI history or surgeries, metabolic disorders, heart or renal disease, history or toxic ingestions, trauma.

EXIT ORT Guideline
- IV/NG hydration and investigations as per MD

INCLUSION CRITERIA:
- Age 6 months and older;
- Caregiver able to understand instructions;
- Mild to Moderate dehydration (see table 2);
- Mild abdominal pain only (1-4 out of 10);
- Abdomen soft;
- Alert GCS 15;
- Absence of bilious emesis, bloody stools or emesis;
- Otherwise healthy.

GIVE PARENTS ORT KIT:
- Review ORT instructions using pamphlet and video;
- Volume: Age 6-12 months = 5 cc Q 5 min, 1-5 years old = 10cc q5min, >5 years old =15cc q5min. (Approximately 10-15cc/kg/hour);
- Give first dose of ORT and inform caregiver to repeat q5 minutes;
- Instruct caregiver to document ORT intake and emesis;
- Inform caregiver of name of assigned nurse whom they may ask for help.

ASSESSMENT:
- Vital signs;
- Total in and out
- # of emesis or diarrhea

MD ASSESSMENT OF:
- Clinical diagnosis;
- Level of dehydration (mild, moderate or severe) and progression since ORT initiation.

- Clinical condition and dehydration level stable (mild) or improved;
- Able to take ORT;
- Able to maintain intake equal to output;
- Family able to provide ORT comfortably and reliably

Exit ORT guideline
- IV/NG hydration and investigations as per MD

Discharge home with clear written instructions:
- How to continue progressing ORT to DAT;
- Recognition of deterioration and need for re-evaluation
BC Children’s Hospital
Division of Pediatric Emergency Medicine
Clinical Practice Guidelines

GASTROENTERITIS SYMPTOMS CAUSING MILD TO MODERATE DEHYDRATION: THE USE OF ORAL REHYDRATION THERAPY (ORT) in the Emergency Department

AUTHORS:
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CLINICAL PRACTICE GUIDELINE TASK FORCE:
CHAIRMAN: Paul Korn. MD FRCP(C)
Clinical Associate Professor
Head, Division, General Pediatrics
Department of Pediatrics, UBC
pkorn@cw.bc.ca

MEMBERS: TBD

CREATED: September, 2007
LAST UPDATED: September 28, 2007
FIGURES: 1
BACKGROUND

Acute gastroenteritis is one of the most common illness affecting infants and children. In developed countries, the average child under 5 years of age experiences 2.2 episodes of diarrhea per year; whereas children attending day care centers may have even higher rates of diarrhea. These episodes result in large number of pediatric office and emergency departments (ED) visits. In the US, treatment for dehydration as a result of acute gastroenteritis accounts for an estimated 200,000 hospitalizations and 300 deaths per year, with comparable rates occurring in Canada. (1) Annually, costs of medical and non medical factors related to gastroenteritis in the US are 0.6 to $1.0 billion. (2) Medical associations and international humanitarian organizations such as the Canadian Pediatric Society, American Academy of Pediatrics (AAP), and World Health Organization have stressed the importance of consistent treatment protocols for the treatment of mild to moderate dehydration. These protocols, based on scientific evidence, emphasize the safety and effectiveness of oral re-hydration therapy (ORT) in cases of mild and moderate dehydration. ORT is effective in 95% of cases of mild to moderate dehydration, it less invasive, less expensive, is associated with less morbidity and can be dispensed outside of the hospital setting, while being as effective as IV treatment(1) (3) (4) (5).

Despite these recommendations and compelling evidence supporting the use of ORT, it remains underused. Some of the factors contributing to under use of ORT include: physicians lack awareness of AAP and CPS gastroenteritis guidelines; perception of barriers to the use of ORT; and variation in overall practice pattern. (6) (7) This has resulted in highly inconsistent quality of care for gastroenteritis.

Implementation of an ED ORT clinical pathway for mild to moderate dehydration in children may help promote consistent evidence based practice and improvement in quality of care (8)

Inclusion criteria: Children aged 6 months to 17 years old presenting to ED, with either vomiting and/or diarrhea fewer than 7 consecutive days resulting in mild to moderate dehydration.

Exclusion criteria: Children presenting with: severe dehydration (unstable vital signs, poor perfusion), altered level of consciousness (Glasgow Coma Score<15 or persistent lethargy or acute head injury), possible surgical abdomen (bloody or bilious vomiting, bloody diarrhea, abdominal distention & tense, absent bowel sounds, guarding or rigidity and right lower quadrant pain), chronic health conditions (such as Gastric or Jejunal feeding tubes dependence, known inflammatory bowel disease, known immunodeficiency syndrome, known metabolic disorders, insulin dependent diabetes, heart or renal disorder and neurosurgical history).
ORAL REHYDRATION SOLUTIONS:

<table>
<thead>
<tr>
<th>TABLE 1</th>
<th>Compositions of World Health Organization oral rehydration solutions (ORS) and ORS used in Canada</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product</td>
<td>Carbohydrate (g/L)</td>
</tr>
<tr>
<td>WHO (standard formula)</td>
<td>20</td>
</tr>
<tr>
<td>WHO (revised formula)</td>
<td>13.5</td>
</tr>
<tr>
<td>Pedialyte (Abbott Laboratories, USA)</td>
<td>25</td>
</tr>
<tr>
<td>Gastrolyte (Aventis Pharma, USA)</td>
<td>17.8</td>
</tr>
<tr>
<td>Enfalyte (Mead Johnson Nutritions, USA) (rice syrup solids)</td>
<td>32</td>
</tr>
<tr>
<td>Cera (Cera Products, USA) (rice digest) (sucrose)</td>
<td>40</td>
</tr>
</tbody>
</table>

(5)

Table 2 Clinical assessment of degree of dehydration

<table>
<thead>
<tr>
<th>Degree of dehydration</th>
<th>Mild (5-7% body weight)</th>
<th>Moderate (7-9% body weight)</th>
<th>Severe (&gt;10% body weight)</th>
</tr>
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<tbody>
<tr>
<td>Fontanelle</td>
<td>Slightly sunken</td>
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<td>Mucous membranes</td>
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<tr>
<td>Mental status</td>
<td>Normal</td>
<td>Slightly fussy</td>
<td>Irritable or lethargic</td>
</tr>
</tbody>
</table>
REFERENCES


## Developmental Milestones

<table>
<thead>
<tr>
<th>Age</th>
<th>Gross Motor</th>
<th>Fine Motor</th>
<th>Cognitive, Language, Communication</th>
<th>Social - Emotional</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 months</td>
<td>Lift head</td>
<td>Follow to midline</td>
<td>Vocalize</td>
<td>Smile responsively</td>
</tr>
<tr>
<td>4 months</td>
<td>Sit – head steady</td>
<td>Grasp rattle</td>
<td>Laugh</td>
<td>Regard own hand</td>
</tr>
<tr>
<td>6 months</td>
<td>Roll over</td>
<td>Reach</td>
<td>Turn to rattling sound</td>
<td>Work for toy (out of reach)</td>
</tr>
<tr>
<td>9 months</td>
<td>Stand holding on</td>
<td>Pass cube (Transfer)</td>
<td>Single syllables</td>
<td>Feed self</td>
</tr>
<tr>
<td>1 Year</td>
<td>Pull to stand</td>
<td>Bang 2 cubes held in hand</td>
<td>*Imitate vocalizations and sounds</td>
<td>*Protodeclarative pointing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Babbling</td>
<td>Pat-a-cake</td>
</tr>
<tr>
<td>15 months</td>
<td>Stoop and recover</td>
<td>Put block in cup</td>
<td>*1 word</td>
<td>Wave bye bye</td>
</tr>
<tr>
<td>18 months</td>
<td>Walk backwards</td>
<td>Scribble</td>
<td>3 words</td>
<td>Help in house</td>
</tr>
<tr>
<td>2 years</td>
<td>Kick ball forward</td>
<td>Tower of 4 cubes</td>
<td>Point to 2 pictures</td>
<td>Remove garment</td>
</tr>
<tr>
<td></td>
<td>Walk up steps</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 ½ years</td>
<td>Jump up</td>
<td>Tower of 6 cubes</td>
<td>Point to 6 body parts</td>
<td>Put on clothing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Name 1 picture</td>
<td></td>
</tr>
<tr>
<td>3 years</td>
<td>Throw ball overhand</td>
<td>Tower of 6 cubes</td>
<td>Name 4 pictures</td>
<td>Brush teeth with help</td>
</tr>
<tr>
<td>4 years</td>
<td>Balance on each foot</td>
<td>Tower of 8 cubes</td>
<td>Speech all understandable</td>
<td>Copy a circle</td>
</tr>
<tr>
<td></td>
<td>2 seconds</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Absence of these milestones should trigger screening for autism.*
Suspected Febrile Seizures

Stop seizure

Seizure stopped?

Yes

If febrile, give Acetaminophen 15mg/kg or Ibuprofen 10mg/kg

Clinical Assessment

No

Focus for fever? Appears toxic?

Yes

Suspected meningitis or encephalitis?

Yes

Investigate and treat suspected bacterial source of infection

No

Any of the following:
- seizure lasting ≥ 15 minutes
- focal seizure
- second seizure in 24 hrs

Simple febrile seizures

No

Complex febrile seizures

Age 12 months or younger? OR on antibiotics?

No

Handout to parents
- Reassure parents
- Discharge
- Consider follow-up with pediatrician in the community

Complex febrile seizures

Yes

Strongly consider an LP CBC, diff, electrolytes, glucose
- Consider CT or MRI within 24 hours

Admit

Treat for meningitis/encephalitis

CSF Normal?

No

Handout to parents
- Reassure parents
- Discharge
- Consider follow-up with pediatrician in the community

Consider observation

Yes

Handout to parents
- Reassure parents
- Discharge
- Consider follow-up with pediatrician in the community

CSF Normal?
FEBRILE SEIZURES
in the Emergency Department

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CLINICAL PRACTICE GUIDELINE
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MEMBERS:
TBD

CREATED:
September, 2007
LAST UPDATED:
September 20, 2007
FIGURES: 1
**KEY POINTS:**

1. *Febrile seizures (simple and complex) are almost always benign and generally are not associated with neurological consequences.*
2. *The mainstay of investigation and treatment is to rule-out bacterial meningitis.*
3. *There are limited indications for investigations including blood work, neuroimaging or electroencephalography (EEG).*
4. *Clear explanation to and reassurance of caregivers is key in the management of the child.*

Febrile seizures have been defined as “an event in infancy or childhood, usually occurring between 3 months and 5 years of age, associated with fever but without evidence of intracranial infection or defined cause”¹. They are the most common type of seizure and occur in approximately 3-5% of children ², ³ although a higher incidence up to 14% has been described in Asia⁴.

Seizures may occur prior to the onset of the fever or with only a mild fever, but usually the temperature is greater than 38.5°C. There is, however, a correlation between lower temperature and a shorter duration of fever before the initial febrile seizure and an increased risk of recurrence of febrile seizure.⁵

**Investigation**

A febrile seizure must be distinguished from a seizure due to a acute infection such as **bacterial meningitis** that requires urgent investigation and treatment. Bacterial meningitis has been demonstrated in 1.8 – 5.4% of children presenting with a febrile seizure,⁶ but with recent additions of available vaccines the incidence of bacterial meningitis will likely be smaller.

The current recommendation is that lumbar puncture (LP) be performed if meningeal signs are present, be strongly considered if the child is less than 12 months of age or had received antibiotics prior to the seizure, and be considered if the child is less than 18 months of age.⁶ A thorough history and physical exam by an experienced clinician is required to determine possible bacterial meningitis.

Other diagnoses to be differentiated from simple febrile seizure include: encephalitis, gastroenteritis due to *Shigella Sp.*, ingestions (such as diphenhydramine, tricyclic antidepressants, amphetamines, and cocaine), electrolyte abnormalities, hypoglycemia, and head injury (both accidental and abusive)

**Investigations**

**Blood Work**

Routine blood work is not indicated for simple febrile seizures.⁷ Laboratory investigations should be dictated by the clinical condition of the child and by an appropriate clinical policy for children of that age presenting to the emergency department with fever.

**Urine**

A urinalysis is recommended for patients with no obvious focus of infection.

**Lumbar Puncture**
An LP should be strongly considered in all infants less than 12 months of age with no clear source for fever, as the signs of meningitis may be difficult to identify in this age group. An LP should be considered in children between 12 months to 18 months of age.

Partially treated meningitis must be considered in children who are on antibiotics prior to the seizure, and an LP should be considered regardless of age. Even if an LP is performed and the results are negative, one may consider treatment of meningitis, as CSF may be normal in the early stages of meningitis. LP should not be considered for children that the responsible physician considers unstable haemodynamically.

**Imaging**

Neuroimaging is not indicated after a simple febrile seizure, but should be considered when there are clinical features of a neurological disorder, e.g., micro/macrocephaly, neurocutaneous abnormalities, pre-existing neurological deficit, and postictal neurological deficit persisting for more than a few hours, or when there are recurrent complex febrile seizures, particularly where there is doubt whether the seizures are febrile. Magnetic resonance imaging is more sensitive than computed tomography for brain disorders that may present with seizures.

**Electroencephalography**

EEG is not helpful in the detection of children with simple febrile seizures who are likely to develop an afebrile seizure. Epileptiform abnormalities are relatively common in children with benign febrile seizures. EEG has a low sensitivity in children under three years of age following an unprovoked seizure. EEG may have some role, albeit limited, in the diagnosis of acute encephalopathic disorders if the child remain encephalopathic for longer than normal following a febrile seizure.

**Treatment**

Most febrile seizures are brief and the seizure has stopped prior to presentation in the Emergency Department. If the seizure has not stopped, treatment with intravenous diazepam or lorazepam is warranted. Rectal diazepam (0.5 mg/kg) or lorazepam (0.1 mg/kg) should be administered if intravenous access cannot be established readily. There have been no controlled studies of buccal midazolam in febrile seizures but buccal midazolam (0.5 mg/kg; max dose 10 mg) was more effective than rectal diazepam for children presenting to hospital with acute seizures and was not associated with an increased incidence of respiratory depression.

The next step in management is to exclude a serious underlying cause, such as bacterial meningitis. The characteristic features of meningitis may be masked in children under 18 months of age and those who have received antibiotics.

An integral part of the management of a first febrile seizure is helping the family to cope with a frightening experience. Parents may believe that their child is dying during a first febrile seizure. The challenge is to help the family deal with the emotional trauma and to understand the excellent prognosis. It is important that the family understand that there is no increased risk of intellectual delay or school difficulties and that febrile seizures less than 30 minutes do not result in brain damage. The family should be provided with information relating to the risk of recurrence during the same illness or in the future and how to deal with subsequent seizures. The family should be taught about the low risk of developing epilepsy and the lack of benefit of using antiepileptic drug treatment in altering that risk. This information should be discussed with the family when the child is seen at the time of the febrile seizure. The family should also receive “Febrile Seizure” information as a handout before leaving the Emergency Department.

**Recurrence**
The risk of recurrence after the first febrile seizure is about 33%, and about 9% will have three or more episodes of a febrile seizure. Half of the children will have another febrile seizure during a febrile illness in the following year.  

Several factors increase the likelihood of recurrence and include: first febrile seizure at a young age; family history of febrile seizures; short duration of fever before the seizure; relatively low fever at the time of the initial seizure. There seems to be a genetic predisposition for febrile seizures as the risk for other siblings to develop febrile seizures is about 10-20%, but may be higher if the parents also have a history of febrile seizures themselves. 

There is no evidence that treatment of simple febrile seizures can prevent later development of epilepsy or that there is any structural damage or higher risk of subsequent cognitive decline. 

A small proportion of children will have multiple febrile seizures. Continuous prophylaxis with antiepileptic medications is not recommended, and intermittent administration of antipyretics was not found to be effective. There is a lack of consensus regarding the efficacy of intermittent diazepam, and the efficacy of midazolam as an intermittent prophylactic agent should be investigated. Therefore, intermittent prophylactic therapy to prevent recurrent febrile seizures cannot be recommended at this time, pending further research. Instead, emphasis should be placed on parent education and reassurance, as febrile seizures are a frightening, stressful experience for the parent. 

**Admission**

The decision to admit a patient with febrile seizure is mostly related to the source of the fever. In general, children with a simple febrile seizure can be discharged from the Emergency after explanation and reassurance of the caregivers. Indications for admission may include:

1. Undifferentiated infection and possible meningitis or encephalitis;
2. Treatment of infections other than meningitis or encephalitis; or
3. Significant caregiver anxiety and concerns of coping with a recurrent seizure at home.
OTHER SOURCES

BC Children’s Emergency - www.bcch.bc.ca
www.epilepsy.com/epilepsy-febrile.html;
http://www.patient.co.uk/showdoc/23068735/
REFERENCES


CLINICAL PRACTICE GUIDELINE FOR FIRST-TIME FEBRILE UTI

CLINICAL PRESENTATION

Suspected UTI
- Fever, vomiting, irritability, change in urine odor or color
- CVA tenderness

WORK-UP:
- Urine R&M and C&S
- CBC, diff, Blood C&S
- Electrolytes, Urea, Creatinine

NOTE 1:
- Bladder catheterization ≤ 6 mos of age
- Bag specimen may be used as a screen if infant > 6 mos of age; proceed to bladder catheterization if suspicious

Suspicious for UTI?
- Yes
  - Patient > 2 months old?
    - Yes
      - IV or IM Ceftriaxone: 50 mg/kg/day, once daily
      - OR
      - Oral Cefixime: 8 mg/kg/day, once daily. Give a double dose on Day 1.
      - Arrange Pediatric follow-up within 24 hrs
      - Arrange Renal U/S
      - Arrange DMSA scan if ≤ 12 mos of age
    - No
      - Admit for IV antibiotics
      - Toxic Patient
        - IV Ampicillin: 200 mg/kg/day
        - IV Gentamicin: 7.5 mg/kg/day
      - Non-Toxic Patient
        - Ceftriaxone: 50 mg/kg/day

NOTE 5:
- IV antibiotics for minimum of 5 days
- Adjust antibiotic therapy based on sensitivities
- Exit guideline if CSF indicates meningitis

NOTE 6:
- Continue IV antibiotics until patient afebrile for 48 hrs
- Adjust antibiotic therapy based on sensitivity
- Arrange inpatient renal U/S
- Arrange acute phase DMSA
- Continue oral antibiotics to complete 10 day course
- Discharge when patient tolerating oral fluid

NOTE 7:
If patient is deteriorating, toxic, or vomiting, arrange admission for IV antibiotics

Is the patient stable?
- Yes
  - Exit guideline and arrange admission
- No
  - Continue IV or IM Ceftriaxone or Oral Cefixime (8 mg/kg/day, once daily)
  - Arrange 2nd pediatric follow-up

2nd Pediatric Follow-up:
- Check Urine C&S
- Exit Guideline and arrange admission

CONCLUDING FOLLOW-UP
- VCUG
  - Yes
    - VUR ≤ Grade II reflux
  - VUR > Grade II reflux
    - Consider prophylactic antibiotics
      - VUR ≤ Grade II reflux
        - Consider prophylactic antibiotics
        - Urinary tract infection
      - VUR > Grade II reflux
        - Consider prophylactic antibiotics
        - Urinary tract infection
- Consider nephrology consult
- Arrange BP monitoring q6 months for children under 2 yrs of age and annually for children over 2 yrs of age
- Start prophylactic antibiotics if TCP/SMX or Nitrofurantoin

NOTE 8:
No further treatment required if diagnosis of a febrile UTI appears unlikely

NOTE 9:
Start a 2 day course of therapeutic antibiotics on the day of and the day following VCUG

NOTE 2:
Criteria for Outpatient Care:
- Non-toxic
- Tolerating oral fluids
- Well hydrated
- Can effectively communicate with family
- Family lives near hospital
- Follow-up is assured

NOTE 3:
Give Cefixime in ER and observe 1 hour

NOTE 4:
Within 3-7 days of onset of symptoms

NOTE 5:
IV antibiotics for IV antibiotics for minimum of 5 days

NOTE 6:
Adjust antibiotic therapy based on sensitivities

NOTE 7:
Exit guideline if CSF indicates meningitis

NOTE 8:
No further treatment required if diagnosis of a febrile UTI appears unlikely

NOTE 9:
Start a 2 day course of therapeutic antibiotics on the day of and the day following VCUG
Clinical Practice Guideline
Febrile Infants: 0 – 60 Days of Age
Unknown Source of Infection

Rectal Temp ≥ 38°

→ Focal Infection?
  Yes → Treat as appropriate to site and severity
  No

→ Toxic?
  Yes → High risk?
    Yes → Admit
    CBC, Blood Culture
    Urinalysis and urine culture
    LP when stable
    Consider NPW
    Consider CXR
    Start IV antibiotics (within 1 hour of physician assessment)
    Fluid resuscitation
    No

→ ≤ 30 Days?
  Yes → Investigations Abnormal?
    Yes → Admit for IV Antibiotics
    No

  No → CBC, Blood Culture
      Urinalysis and urine culture
      Consider LP
      Consider NPW
      Consider CXR

  → Reliable follow-up?
    Yes → Consider IV or IM Ceftriaxone
    Arrange follow-up within 24 hrs.
    Discharge
    No → Admit for observation
    Consider IV or IM Ceftriaxone
    Fluid resuscitation if required
START

**Toxic?**
- Lethargy
- Poor eye contact
- Poor perfusion
- Hypo/hyperventilation
- Cyanosis

Yes → **SBI Risk for a Toxic Infant**
17.3% (8 – 30%)
(Baraff 1993 [E])

No → **High Risk Factors?**

**Clinical**
1. History of prematurity (<37 wks)
2. Perinatal antibiotics
3. Treated for unexplained jaundice
4. History of previous rehospitalization
5. Chronic or underlying illness
6. Not discharged with mother
7. Intrapartum history of mother for fever; Group B streptococcus, or antibiotic treatment

Yes → **SBI Risk for a High Risk Infant**
8.6% (3.7 – 15.6%)
(Baraff 1993 [E])

**Investigations (abnormal)**
1. WBC <5,000/μl or 15,000/μl
2. Bands >1,500/μl
3. Urine >10 WBC/hpf (sterile catch); positive nitrites
4. CSF abnormal (if obtained)
5. If diarrhea present: >5 WBC/hpf in stool

Yes → **SBI Risk for a Toxic Infant**
17.3% (8 – 30%)
(Baraff 1993 [E])

**Antibiotic Therapy**

<table>
<thead>
<tr>
<th>Inpatient (0 – 30 days)</th>
<th>Inpatient (31 – 60 Days)</th>
<th>Outpatient (31 – 60 Days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ampicillin/Gentamicin</td>
<td>Cefotaxime (high risk)</td>
<td>Ceftriaxone</td>
</tr>
<tr>
<td>Or</td>
<td>Or</td>
<td></td>
</tr>
<tr>
<td>Ampicillin/Cefotaxime</td>
<td></td>
<td>Ceftriaxone (low risk)</td>
</tr>
</tbody>
</table>

Transcribed: October 09, 2008
**Fluid and Electrolytes**

**Maintenance therapy in children:**
- Replaces the ongoing losses of water and electrolytes occurring via normal physiologic processes
- Daily water needs are based upon

  **Insensible water losses**
  Under normal physiological conditions, insensible losses account for approximately 45 mL per 100 kcal of energy expended

  **Skin Losses**
  Account for two-thirds of the insensible losses, approximately 30 mL per 100 kcal
  Increase with higher core body temperature
  Due to evaporation from convection and conduction

  **Respiratory Losses**
  Account for one-third of insensible losses
  15 mL per 100 kcal
  Result from the warming and humidification of inspired air

  **Sensible water losses**

  **Stool Losses**
  Water loss from stool is negligible in healthy children

  **Urine Losses**
  Sensible water losses are primarily due to the daily urine output
  55 mL per 100 kcal
  *Obligate urine water loss* - required to excrete the daily solute load from dietary intake and cellular metabolism

**Calculation of Maintenance Fluids:**

Two methods commonly used to calculate maintenance requirements:
1. “4, 2, 1” rule to calculate hourly requirements.
   - 4 cc/kg/hr for 1st 10 kg
   - 2 cc/kg/hr for 2nd 10 kg
   - 1 cc/kg/hr for the remaining kg.

2. “100, 50, 20” rule to calculate daily requirements.
   - 100 cc/kg/day for 1st 10 kg
   - 50 cc/kg/day for 2nd 10 kg
   - 20 cc/kg/day for remaining kg.

Both methods are estimations and must be used in conjunction with clinical assessment of the patients. Patients who are receiving intravenous fluids should be constantly monitored for hydration status (dehydration or fluid overload).
Maintenance fluids in Neonates:

The two methods above are not used in neonates as it overestimates the fluid requirements in the first few days and underestimates fluid requirements after day 4.

In Neonates we order as total fluid intake (TFI) per day:
For full term infants:
Day 1: 60 cc/kg/day
Day 2: 80 cc/kg/day
Day 3: 100 cc/kg/day
Day 4: 120 cc/kg/day
Day 5: 140 cc/kg/day
Beyond: 150 cc/kg/day

The above are guidelines of amount of fluid to be given to a neonate, the requirements might vary depending on the patients condition.

The fluid requirements vary in premature infants, depending on multiple factors most important being the gestational age.
Dehydration:

**Table 2 Clinical assessment of degree of dehydration**

<table>
<thead>
<tr>
<th>Degree of dehydration</th>
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<td>Mental status</td>
<td>Normal</td>
<td>Slightly fussy</td>
<td>Irritable or lethargic</td>
</tr>
</tbody>
</table>

**Fluid requirements for dehydration:**

The fluid requirement for dehydration includes:
- Maintenance + Deficits + ongoing losses.

The deficit is corrected over 24 hours with ½ the deficit given in 1st 8 hours and the remaining ½ given in the subsequent 16 hours. The exception is Diabetic Ketoacidosis, where dehydration must be corrected slowly to avoid cerebral edema. EXCESSIVE FLUID ADMINISTRATION IN DKA CAN RESULT IN DEATH. Although, you assess the fluid status and calculate the fluid requirement initially, the fluid status should be re-evaluated every 4-6 hours as conditions can change dramatically.

If clinically warranted a “bolus” may be given to correct some of the deficit immediately. Normal saline is the fluid that is used for bolus. Rarely Ringer’s Lactate can be used for bolus. The usual dose is 10-20 cc/kg given over 30 – 60 minutes. In severe shock normal saline can be given more rapidly (IV push). The bolus can be repeated as indicated.

**Electrolyte and Glucose Requirements:**

**Sodium:** Daily sodium requirement is 2-3 mEq/kg/day. This is usually met with normal saline or 2.5 mEq NaCl per 100 cc of fluid at maintenance rate.
Potassium: Daily potassium requirements is 1-2 mEq/kg/day at maintenance.
   • Never use KCl
   • Before a patient has voided at least once in hospital
   • In boluses
   • In TKVO or SL lines

Glucose: Daily glucose requirements is approximately 6-8 mg/kg/min. This is usually met with 5% dextrose.

Standard IV solutions:

<table>
<thead>
<tr>
<th>Fluids</th>
<th>Na</th>
<th>K</th>
<th>Cl</th>
<th>Kcal/L</th>
<th>mOsm/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS</td>
<td>154</td>
<td>0</td>
<td>154</td>
<td>0</td>
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</tr>
<tr>
<td>½ NS</td>
<td>77</td>
<td>0</td>
<td>77</td>
<td>0</td>
<td>154</td>
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<tr>
<td>DSW</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>D10W</td>
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<td>0</td>
<td>0</td>
<td>340</td>
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</tr>
<tr>
<td>DSNS</td>
<td>154</td>
<td>0</td>
<td>154</td>
<td>170</td>
<td>560</td>
</tr>
<tr>
<td>Ringer’s</td>
<td>130</td>
<td>4</td>
<td>109</td>
<td>9</td>
<td>273</td>
</tr>
</tbody>
</table>

These are commercially manufactured and readily available on most wards and in most emergency rooms.

The benefit of using standard solutions is decreasing the risk of errors.

In general, because most of the unwell patients have a degree of SIADH, isotonic intravenous solutions should be used. Use of hypotonic intravenous solutions can result in iatrogenic hyponatremia.

Special circumstances:

TKVO (to keep vein open):

Involves administering small amount of volume continuously through the IV to unsure it remains patent and does not clot necessitating its removal (usually done when child is starting to eat better).

Generally 2 cc/hour if peripheral intravenous line and 4 cc/hr if central intravenous line. In very small newborns and critically ill patients smaller volumes may be considered.

TVKO rates used at BC Children’s and Women’s Hospital.

<table>
<thead>
<tr>
<th>Patient</th>
<th>Peripheral IV</th>
<th>Central Line/PICC</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 50 kg Non-critical care</td>
<td>2 mL/hr</td>
<td>4 mL/hr</td>
</tr>
<tr>
<td>&gt;50 kg Non-critical care</td>
<td>5 mL/hr</td>
<td>10 mL/hr</td>
</tr>
</tbody>
</table>
Critical care | 1 mL/hr | 2 mL/hr
---|---|---
Premature neonates | 1 mL/hr | 2 mL/hr (1 mL/hr if heparinized solution)

**Saline Lock:**
Involves leaving the IV catheter in situ but removing the tubing so the patient is no longer connected to an IV line and bag and is able to move freely.

A small volume of saline generally 15 cc is administered every 6-8 hours in an effort to maintain patency of IV catheter and avoid its clotting.

Not always effective in children but commonly done because of the freedom it allows for movement.

**Heparin Lock:**
Same principle as saline lock.
A small dose of diluted heparin is administered in saline to sit in the hub of the IV catheter and prevents its clotting.

Every 6-8 hours this dose is withdrawn and a new dose is instilled. It is important that the dose is not inadvertently flushed into the patient.

More effective than saline lock in maintaining IV patency but not commonly done because of the risk of an inadvertent heparin overdose.

**Iatrogenic Hyponatremia:**
Ongoing administration of hypotonic solutions may result in iatrogenic hyponatremia.
Hyponatremia is often caused by the intake of electrolyte-free water that cannot be excreted due primarily to persistent ADH secretion that is "inappropriate," or not triggered by usual osmotic or volume parameters.

In children, inappropriate ADH secretion may occur
- post-operatively
- central nervous system
- pulmonary infections
- medications
- pain
- anxiety

This can result in neurologic impairment and death.

Children who are given intravenous fluids should be closely monitored for urine output and if on prolonged intravenous fluids should have their electrolytes checked regularly.
<table>
<thead>
<tr>
<th>AGE</th>
<th>2 months</th>
<th>4 months</th>
<th>6 months</th>
<th>12 months</th>
<th>18 months</th>
<th>4-6 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>VACCINE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DTaP-HB-IPV-Hib (diphtheria, tetanus, pertussis, hepatitis B, polio, Haemophilus influenzae type b)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Vaccine HealthFile</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DTaP-IPV-Hib (diphtheria, tetanus, pertussis, polio, Haemophilus influenzae type b)</td>
<td></td>
<td></td>
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<tr>
<td>1. Vaccine HealthFile</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>DTaP-IPV (diphtheria, tetanus, pertussis, polio)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>1. Vaccine HealthFile</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal conjugate ‡</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Vaccine HealthFile</td>
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<tr>
<td>Meningococcal conjugate C</td>
<td>✓</td>
<td></td>
<td>✓</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MMR (measles, mumps, rubella)</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>1. Vaccine HealthFile</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varicella (chickenpox)</td>
<td>✓</td>
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<td>✓</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Rotavirus</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
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<tr>
<td>1. Vaccine HealthFile</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influenza</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>*</td>
<td>(6-23 months)</td>
</tr>
<tr>
<td>1. Vaccine HealthFile</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis A ♦</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>1. Vaccine HealthFile</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

‡ Children with specific medical conditions that place them at high risk of disease should receive an additional dose at 6 months of age. See the web link for more information or speak to your doctor or public health nurse.

* Second dose needed 4 weeks after the first if receiving vaccine for first time.

♦ Hepatitis A vaccine will be offered to aboriginal children living both on-reserve and off-reserve.

◧ Hepatitis A vaccine will be offered to aboriginal children starting at 6 months. Alternatively, 1 or 2 doses at 4-6 years will be offered depending on previous immunization history.

29-Dec-2011
# USMLE Step 2 CK Laboratory Values

* Included in the Biochemical Profile (SMA-12)

<table>
<thead>
<tr>
<th><strong>BLOOD, PLASMA, SERUM</strong></th>
<th><strong>REFERENCE RANGE</strong></th>
<th><strong>SI REFERENCE INTERVALS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>* Alanine aminotransferase (ALT, GPT at 30°C)</td>
<td>8-20 U/L</td>
<td>8-20 U/L</td>
</tr>
<tr>
<td>Amylase, serum</td>
<td>25-125 U/L</td>
<td>25-125 U/L</td>
</tr>
<tr>
<td>* Aspartate aminotransferase (AST, GOT at 30°C)</td>
<td>8-20 U/L</td>
<td>8-20 U/L</td>
</tr>
<tr>
<td>Bilirubin, serum (adult) Total / Direct</td>
<td>0.1-1.0 mg/dL / 0.0-0.3 mg/dL</td>
<td>2.1-2.8 μmol/L / 0.5 μmol/L</td>
</tr>
<tr>
<td>* Calcium, serum (Ca²⁺)</td>
<td>8.4-10.2 mg/dL</td>
<td>2.1-2.6 mmol/L</td>
</tr>
<tr>
<td>Cholesterol, serum</td>
<td>Rec: &lt;200 mg/dL</td>
<td>&lt;5.2 mmol/L</td>
</tr>
<tr>
<td>Cortisol, serum</td>
<td>0800 h: 5-23 μg/dL // 1600 h: 3-15 μg/dL</td>
<td>138-635 nmol/L // 82-413 nmol/L</td>
</tr>
<tr>
<td>Creatine kinase, serum</td>
<td>Male: 25-90 U/L // Female: 10-70 U/L</td>
<td>25-90 U/L // 10-70 U/L</td>
</tr>
<tr>
<td>* Creatinine, serum</td>
<td>0.6-1.2 mg/dL</td>
<td>53-106 μmol/L</td>
</tr>
<tr>
<td>Electrolytes, serum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sodium (Na⁺)</td>
<td>136-145 mEq/L</td>
<td>136-145 mmol/L</td>
</tr>
<tr>
<td>Chloride (Cl⁻)</td>
<td>95-105 mEq/L</td>
<td>95-105 mmol/L</td>
</tr>
<tr>
<td>* Potassium (K⁺)</td>
<td>3.5-5.0 mEq/L</td>
<td>3.5-5.0 mmol/L</td>
</tr>
<tr>
<td>Bicarbonate (HCO₃⁻)</td>
<td>22-28 mEq/L</td>
<td>22-28 mmol/L</td>
</tr>
<tr>
<td>Magnesium (Mg²⁺)</td>
<td>1.5-2.0 mEq/L</td>
<td>0.75-1.0 mmol/L</td>
</tr>
<tr>
<td>Estriol, serum (in pregnancy)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24-28 weeks // 32-36 weeks</td>
<td>30-130 ng/mL // 60-280 ng/mL</td>
<td>104-590 // 208-970 nmol/L</td>
</tr>
<tr>
<td>28-32 weeks // 36-40 weeks</td>
<td>40-220 mg/dL // 80-330 ng/mL</td>
<td>140-760 // 280-1210 nmol/L</td>
</tr>
<tr>
<td>Ferritin, serum</td>
<td>Male: 15-200 ng/mL</td>
<td>15-200 μg/L</td>
</tr>
<tr>
<td>Female: 12-150 ng/mL</td>
<td>12-150 μg/L</td>
<td></td>
</tr>
<tr>
<td>Follicle-stimulating hormone, serum/plasma</td>
<td>Male: 4-25 mIU/mL</td>
<td>4-25 U/L</td>
</tr>
<tr>
<td>Female: premenopause 4-30 mIU/mL</td>
<td>4-30 U/L</td>
<td></td>
</tr>
<tr>
<td>midcycle peak 10-90 mIU/mL</td>
<td>10-90 U/L</td>
<td></td>
</tr>
<tr>
<td>postmenopause 40-250 mIU/mL</td>
<td>40-250 U/L</td>
<td></td>
</tr>
<tr>
<td>Gases, arterial blood (room air)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>7.35-7.45</td>
<td>[H⁺] 36.44 nmoL/L</td>
</tr>
<tr>
<td>PCO₂</td>
<td>33.45 mm Hg</td>
<td>4.4-5.9 kPa</td>
</tr>
<tr>
<td>PO₂</td>
<td>75-105 mm Hg</td>
<td>10.0-14.0 kPa</td>
</tr>
<tr>
<td>* Glucose, serum</td>
<td>Fasting: 70-110 mg/dL</td>
<td>3.8-6.1 mmol/L</td>
</tr>
<tr>
<td></td>
<td>2-h postprandial: &lt;120 mg/dL</td>
<td>&lt;6.6 mmol/L</td>
</tr>
<tr>
<td>Growth hormone - arginine stimulation</td>
<td>Fasting: &lt;5 mg/mL</td>
<td>&lt;5 μg/L</td>
</tr>
<tr>
<td></td>
<td>provocative stimol: &gt;7 mg/mL</td>
<td>&gt;7 μg/L</td>
</tr>
<tr>
<td>Immunoglobulins, serum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IgA</td>
<td>76-390 mg/dL</td>
<td>0.76-3.90 g/L</td>
</tr>
<tr>
<td>IgG</td>
<td>760-1500 mg/dL</td>
<td>0.76-3.90 g/L</td>
</tr>
<tr>
<td>Epitope (IgE)</td>
<td>650-1500 mg/dL</td>
<td>6.5-15.0 g/L</td>
</tr>
<tr>
<td>IgM</td>
<td>40-345 mg/dL</td>
<td>0.4-3.45 g/L</td>
</tr>
<tr>
<td>Iron</td>
<td>30-170 μg/dL</td>
<td>0.93-5.0 μmol/L</td>
</tr>
<tr>
<td>Lactate dehydrogenase, serum</td>
<td>2-45 U/L</td>
<td>2-45 U/L</td>
</tr>
<tr>
<td>Luteinizing hormone, serum/plasma</td>
<td>Male: 6-23 mIU/mL</td>
<td>6-23 mIU/mL</td>
</tr>
<tr>
<td>Female: follicular phase 5-30 mIU/mL</td>
<td>5-30 mIU/mL</td>
<td></td>
</tr>
<tr>
<td>midnight 75-150 mIU/mL</td>
<td>75-150 mIU/mL</td>
<td></td>
</tr>
<tr>
<td>postmenopause 30-200 mIU/mL</td>
<td>30-200 mIU/mL</td>
<td></td>
</tr>
<tr>
<td>Osmolality, serum, urine, N-terminal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>275-295 mOsm/kg</td>
<td>275-295 mOsm/kg</td>
<td></td>
</tr>
<tr>
<td>Parathyroid hormone, serum</td>
<td>230-630 pg/mL</td>
<td>230-630 pg/mL</td>
</tr>
<tr>
<td>Phosphate (alkaline), serum (p-NPP at 30°C)</td>
<td>2.6-7.0 U/L</td>
<td>2.6-7.0 U/L</td>
</tr>
<tr>
<td>* Phosphorus (organic), serum</td>
<td>3.0-4.5 mg/dL</td>
<td>1.0-1.5 mmol/L</td>
</tr>
<tr>
<td>Progesterone, serum (PRL)</td>
<td>&lt;20 ng/mL</td>
<td>&lt;20 μg/L</td>
</tr>
<tr>
<td>* Proteins, serum</td>
<td>Total (recumbent)</td>
<td>6.0-7.8 g/dL</td>
</tr>
<tr>
<td>Albumin</td>
<td>3.5-5.5 g/dL</td>
<td>35.55 g/L</td>
</tr>
<tr>
<td>Globulin</td>
<td>5.5-7.5 g/dL</td>
<td>55.45 g/L</td>
</tr>
<tr>
<td>Thyroid-stimulating hormone, serum or plasma</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TSH</td>
<td>0.5-5.0 μIU/mL</td>
<td>0.5-5.0 μIU/mL</td>
</tr>
<tr>
<td>Thyroid-stimulating hormone, serum or plasma</td>
<td>8% of 30% of administered dose/24 h</td>
<td>0.38-0.30/24 h</td>
</tr>
<tr>
<td>Thyroxine (T₄), serum</td>
<td>5.0-12 μg/dL</td>
<td>66-155 nmol/L</td>
</tr>
<tr>
<td>Triglycerides, serum</td>
<td>33-160 mg/dL</td>
<td>0.41-8.11 mmol/L</td>
</tr>
<tr>
<td>Triiodothyronine (T₃), serum (RIA)</td>
<td>115-190 μg/dL</td>
<td>1.8-2.9 nmol/L</td>
</tr>
<tr>
<td>Triiodothyronine (T₃) resin uptake</td>
<td>25-35%</td>
<td>0.25-0.35</td>
</tr>
<tr>
<td>* Urea nitrogen, serum (BUN)</td>
<td>7.0-18 mg/dL</td>
<td>1.2-3.0 mmol urea/L</td>
</tr>
<tr>
<td>* Uric acid, serum</td>
<td>3.0-8.2 mg/dL</td>
<td>0.18-0.48 mmol/L</td>
</tr>
</tbody>
</table>
### USMLE Step 2 CK Laboratory Values (continued)

#### BODY MASS INDEX (BMI)

| Body mass index | Adult: 19-25 kg/m² |

#### CEREBROSPINAL FLUID

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Reference Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell count</td>
<td>0-5 cells/μL³</td>
</tr>
<tr>
<td>Chloride</td>
<td>118-132 mEq/L</td>
</tr>
<tr>
<td>Gamma globulin</td>
<td>3%-12% total proteins</td>
</tr>
<tr>
<td>Glucose</td>
<td>40-70 mg/dL</td>
</tr>
<tr>
<td>Pressure</td>
<td>70-180 mm H₂O</td>
</tr>
<tr>
<td>Proteins, total</td>
<td>&lt;40 mg/dL</td>
</tr>
</tbody>
</table>

#### HEMATOLOGY

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Reference Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bleeding time (template)</td>
<td>2-7 minutes</td>
</tr>
<tr>
<td>Erythrocyte count</td>
<td>Male: 4.3-5.9 million/mm³</td>
</tr>
<tr>
<td></td>
<td>Female: 3.5-5.5 million/mm³</td>
</tr>
<tr>
<td>Hematocrit</td>
<td>Male: 0-20 mm/h</td>
</tr>
<tr>
<td></td>
<td>Female: 41%-53%</td>
</tr>
<tr>
<td></td>
<td>Female: 36%-46%</td>
</tr>
<tr>
<td>Hemoglobin A₁c</td>
<td>≤6%</td>
</tr>
<tr>
<td>Hemoglobin, blood</td>
<td>Male: 13.5-17.5 g/dL</td>
</tr>
<tr>
<td></td>
<td>Female: 12.0-16.0 g/dL</td>
</tr>
<tr>
<td>Hemoglobin, plasma</td>
<td>14-45 g/dL</td>
</tr>
<tr>
<td>Leukocyte count and differential</td>
<td>Leukocyte count</td>
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<tr>
<td></td>
<td>Segmented neutrophils</td>
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<td>Eosinophils</td>
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<td>Monocytes</td>
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<td>Mean corpuscular hemoglobin</td>
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<td>Mean corpuscular hemoglobin concentration</td>
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<td>Mean corpuscular volume</td>
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<td>Partial thromboplastin time (activated)</td>
</tr>
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<td></td>
<td>Platelet count</td>
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<tr>
<td></td>
<td>Prothrombin time</td>
</tr>
<tr>
<td></td>
<td>Reticulocyte count</td>
</tr>
<tr>
<td></td>
<td>Thrombin time</td>
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<td></td>
<td>Volume</td>
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#### SWEAT

<table>
<thead>
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<tbody>
<tr>
<td>Chloride</td>
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#### URINE

<table>
<thead>
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<th>Parameter</th>
<th>Reference Range</th>
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</thead>
<tbody>
<tr>
<td>Calcium</td>
<td>100-300 mg/24 h</td>
</tr>
<tr>
<td>Chloride</td>
<td>Varies with intake</td>
</tr>
<tr>
<td>Creatinine clearance</td>
<td>Male: 97-137 mL/min</td>
</tr>
<tr>
<td></td>
<td>Female: 88-128 mL/min</td>
</tr>
<tr>
<td>Estriol, total (in pregnancy)</td>
<td>Male: 6-18 mg/24 h</td>
</tr>
<tr>
<td></td>
<td>Female: 3-9 mg/24 h</td>
</tr>
<tr>
<td></td>
<td>Female: 6-45 mg/24 h</td>
</tr>
<tr>
<td>17-Hydroxy cortisol</td>
<td>13-42 mg/24 h</td>
</tr>
<tr>
<td></td>
<td>8.2-14 mg/24 h</td>
</tr>
<tr>
<td>17-Ketosteroids</td>
<td>3-8 mg/24 h</td>
</tr>
<tr>
<td></td>
<td>0.1-0.3 mg/24 h</td>
</tr>
<tr>
<td>Osmolality</td>
<td>50-1400 mOsm/kg</td>
</tr>
<tr>
<td>Oxalate</td>
<td>Varies with diet</td>
</tr>
<tr>
<td>Potassium</td>
<td>Varies with diet</td>
</tr>
<tr>
<td>Proteins, total</td>
<td>&lt;150 mg/24 h</td>
</tr>
<tr>
<td>Sodium</td>
<td>Varies with diet</td>
</tr>
<tr>
<td>Uric acid</td>
<td>Varies with diet</td>
</tr>
<tr>
<td>Day of the week</td>
<td>Monday</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------</td>
</tr>
<tr>
<td>Preceptor of the day/week</td>
<td>Dr. First &amp; Last name</td>
</tr>
<tr>
<td>Physician On-call</td>
<td></td>
</tr>
<tr>
<td>Resident On-call</td>
<td>Call protected</td>
</tr>
<tr>
<td>Student On-call</td>
<td>07:00 -17:00</td>
</tr>
<tr>
<td>Student On-call</td>
<td>17:00 -24:00</td>
</tr>
<tr>
<td>Week # (2) (Month) (5-9)</td>
<td>AM</td>
</tr>
<tr>
<td>Student 1 (Y3): First &amp; Last name</td>
<td>Student 1 (Y3): Clinic with Dr 9 – 11 am</td>
</tr>
<tr>
<td>Student 2 (Y3): First &amp; Last name</td>
<td>Student 2: Wards/Consults 9 – 12 noon</td>
</tr>
<tr>
<td>Student 3 (Y4): First &amp; Last name</td>
<td>Student 3: Office with Dr. 11 – 12 noon 10 am: Working Rounds</td>
</tr>
<tr>
<td>12:00 am – 1:00 pm</td>
<td>Lunch Break</td>
</tr>
<tr>
<td>Resident: First &amp; Last name</td>
<td>Resident: 8 am – 3 pm Clinic with Dr.</td>
</tr>
<tr>
<td>Student 1 (Y3): First &amp; Last name</td>
<td>Student 1: Wards/Consults</td>
</tr>
<tr>
<td>Student 2 (Y3): First &amp; Last name</td>
<td>Student 2: 1 pm Clinic with Dr.</td>
</tr>
<tr>
<td>Student 3 (Y4): First &amp; Last name</td>
<td>Student 3: Office with Dr.</td>
</tr>
<tr>
<td>Resident: Clinic with Dr.</td>
<td>Resident: Clinic with Dr.</td>
</tr>
<tr>
<td>Weekend</td>
<td>Saturday</td>
</tr>
<tr>
<td>Physician On-call</td>
<td>Dr. First &amp; Last Name</td>
</tr>
<tr>
<td>Resident On-call</td>
<td>Dr.</td>
</tr>
<tr>
<td>Student On-call 07:00 -17:00</td>
<td>Student 1 (Y3):</td>
</tr>
<tr>
<td>Student On-call 17:00 -24:00</td>
<td>Student 2 (Y4):</td>
</tr>
</tbody>
</table>