



An agency of the
Provincial Health Services Authority

ENDOCRINOLOGY & DIABETES UNIT

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HANDBOOK FOR PEDIATRIC ENDOCRINOLOGY ROTATION

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ENDOCRINOLOGY & DIABETES UNIT

HANDBOOK FOR PEDIATRIC ENDOCRINOLOGY ROTATION

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Addenda

Sequence of pubertal events and Tanner staging
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Adrenal steroid therapy and weaning
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EDU ROTATION-SPECIFIC GOALS AND OBJECTIVES (by CanMEDS 2005 roles)

MEDICAL EXPERT:

1. To perform a complete, accurate and organized endocrine-related history.
2. To perform an endocrine specific physical exam, which includes the appropriate measurement of height and weight, a thyroid exam and accurate Tanner staging.
3. To understand the physiology of normal and abnormal physical growth and puberty.
4. To know the indications and interpretation of common endocrine tests.
5. To have an approach to the clinical presentation, diagnosis and management of the following conditions:
 - Type 1 and 2 diabetes mellitus
 - Diabetic ketoacidosis
 - Hypo- and hyperthyroidism
 - Adrenal (ACTH) deficiency
 - Fluid and electrolyte disorders, including diabetes insipidus
 - Disorders of puberty
 - Pituitary dysfunction
 - Gender-diverse children and youth

PROFESSIONAL — PROFICIENCY IN:

1. Considering issues of confidentiality when discussing patient issues
2. Understanding of issues involving disabilities, gender, race, religion and culture
3. Respect for all health care team members
4. Sense of responsibility (punctual, dependable, reliable, honest in all information)
5. Sound professional attitude and aware of limitations

COLLABORATOR — PROFICIENCY IN:

1. Working effectively with health care team members, maintains acceptable and workable coworker relationships

MANAGER — PROFICIENCY IN:

1. Initiative (frequently shows initiative in patient management, comments and asks questions in clinic and on rounds, alert to possible significance of diagnostic clues)

ADVOCATE — PROFICIENCY IN:

1. Advocates for individual patient, population and community (mobilizing resources as needed)
2. Adapts practice, management and education to individual patient
3. Promotes health and disease prevention (i.e. Obesity prevention, healthy active living promotion, etc.)

COMMUNICATOR — PROFICIENCY IN:

1. Presentation of Endocrine consults (accurate, complete, organized)
2. Communicating care plan and results of testing to patient and family, (recognizes and understands emotional needs of patients and families, sensitize to them), (Able to develop rapport and trust with family and patient)
3. Keeping other members of the health care team informed about relevant patient issues

4. Presenting at teaching rounds (including consultants and junior trainees: well prepared, organized, suitable to audience levels)
5. Written documentation (history, diagnostic formulation, progress notes, plans, D/C summaries, consult notes are accurate and organized)

SCHOLAR — PROFICIENCY IN:

1. Critical appraisal, evidence-based medicine: utilizes EBM to manage clinical problems, ongoing reading, critically evaluates information and sources
2. Principles and methods of biomedical research: basic understanding of clinical epidemiology, biostatistics and research design

**ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
OBJECTIVES OF TRAINING IN PEDIATRICS (JULY 2008)**

Online at www.royalcollege.ca/cs/groups/public/documents/document/y2vk/mdaw/~edisp/tztest3rcpsced000931.pdf

For all clinical situations listed below, the Pediatrician must be able to evaluate, investigate, diagnose, manage and refer when appropriate:

ENDOCRINOLOGY AND METABOLISM:

- Normal anatomy, embryology and physiology of the endocrine glands
- Normal physical growth
- Physiology of normal and abnormal puberty
- Disorders affecting the endocrine system, producing under- or overactivity
- Indications and interpretation of endocrine tests
- Pharmacology of commonly used drugs and hormones
- Basic pathways and mechanisms of glucose homeostasis

PROBLEMS:

- Growth retardation/short stature
- Disorders of sexual development (ambiguous genitalia / intersex)
- Thyroid disease
- Type 1 and type 2 diabetes mellitus, diabetic ketoacidosis
- Inappropriate ADH secretion
- Hypo/hypercalcemia
- Hypoglycemia
- Pubertal disorders / early/late sexual development
- Pituitary disorders
- Diabetes insipidus
- Adrenal disease
- Hyperlipidemias
- Metabolic bone disease and osteoporosis

CORE COMPETENCIES FOR ALL FACULTY MEMBERS IN THE DEPARTMENT OF PEDIATRICS

1. Self-reflection and appreciation of the ways verbal and non-verbal behaviour impacts colleagues and trainees both positive and negative.
2. Engagement and collegiality, both within and outside the Endocrinology Division.
3. Respectful communication — free of harassment, demeaning comments, public shaming, intimidation, disrespectful comments, or abuse of power. Create a learning environment that feels safe, supportive and nurturing. Appreciate the difference between challenging trainees to think independently in a supportive manner versus making derogatory comments that imply they should already know how to handle a problem and/or criticize them publically when they come up with a management plan that you disagree with.
4. Available and responsive to address the needs of patients, families and trainees in a timely manner – whether in ambulatory clinics, taking outside calls from patients or physicians or when covering the inpatient service, and when on-call after-hours nights and weekends (including on-site rounding).
5. Understand that trainees work with all attending physicians in the division and that expectations for special treatment (such as dictating your clinic patients as a priority before the others) are not acceptable. Continuing to utilize the single divisional standard around processes such as dictations is appreciated by trainees.
6. Learn to appreciate the rewards of effective mentorship without the need for personal gains – ownership, authorship, formal credits for example.
7. Find new joy in your work within your specialty program.
8. Respect confidentiality amongst peers. Avoid critical/negative back hall “gossipy” conversations. Trainees find it distressing when they overhear faculty criticizing their colleagues. Assume that others are listening in on your conversation, even “behind closed doors”.

GRIEVANCE PROCEDURE

FELLOWS IN ENDOCRINOLOGY & METABOLISM (Adult and Pediatric): begin with your Program Director

RESIDENTS IN PEDIATRICS: begin with your Program Director or Chief Resident

MEDICAL STUDENTS (UBC and otherwise): begin with the UBC Pediatrics Clerkship Director

EDU ROTATION RESPONSIBILITIES

MSIs, Residents and Fellows rotating on the EDU service are expected to:

- (1) Attend outpatient clinics daily Monday to Thursday. BCCH Residents are excused Tuesdays **until 1600** for their Academic Half-Day and their scheduled continuity clinics, and Adult Endocrine Fellows are excused for their Academic Half-Day and Fellow's Clinic. Fridays are generally used for paperwork, in addition to attending Pediatric Grand Rounds and Advances in Pediatrics.
- (2) Attend all Department and Division rounds, conferences and journal clubs.
- (3) Prepare a 1-hour conference for Division members, including appropriate visual and written aids. The topic will be chosen jointly by the rotator and a Staff Endocrinologist. The information to be presented should include reflect the current state of knowledge about the topic chosen, as obtained by a literature review. For 1-month rotations only.
- (4) Post-call residents are expected to join Division activities as soon as they have handed over. Permission to leave early is to be obtained **each time** from a Staff Endocrinologist.
- (5) Dictations from all patients should be completed within 48 hours of seeing the patient in clinic.
- (6) PowerChart clinic notes should be completed and submitted to staff in a timely manner, and if test results are pending, they should be submitted to staff before finishing the rotation.
- (7) BCCH Pediatric Residents and VGH/SPH Adult Endocrine Fellows are required to take beeper call up to one in four nights and 1 weekend for the Division. They will also be on daytime service (without clinic duties) for one week of each month. This will be arranged before the start of the rotation so as not to conflict with holidays.
- (8) Follow-up on and discuss with attending staff all pending labs on patients seen in clinic, during the time of your rotation.

TIPS FOR ON-CALL

Numbers with area code 604 or 778 are generally local calls, BUT they can also be long-distance (e.g. Abbotsford); the same holds for new codes 236 and 672. Numbers with area code 250 are always long-distance. The area code for the Yukon is 867, also long-distance. When you dial long-distance, you must first dial 1. NOTE: Sometimes, long-distance calls will sound like a fast busy signal if you have not dialed 1 before the phone number. If you hear this, ensure that you dial 1 plus the full number.

DIVISION ROUNDS / SEMINARS / JOURNAL CLUB

All meetings are held in Room K2-111, 2nd Floor Conference Room in Ambulatory Care Building
The meeting schedule for the month is listed on the clinic assignment sheet.

1. **EDU Endocrine Rounds and/or Academic Presentations:** held 3 Thursdays a month from 0800–0900
2. **EDU Problem-Based Learning Teaching Sessions:** held Monday after clinic from ~1600–1700. Teaching is pager-free time; you may hand your call pager to the on-service Staff Endocrinologist for the hour.
3. **EDU Journal Club:** held one Tuesday a month from 1600–1700
4. **EDU Diabetes Meetings:** held one Wednesday a month from 0800–0900
5. **EDU Diabetes Psychosocial Rounds:** held every second Tuesday from 1230–1300
6. **BC Growth Hormone Advisory Committee Meeting:** held one Tuesday a month from 1600–1700
7. **C&W DSD Committee Meeting:** held one Thursday a month from 0800–0900

**Note that the hospital and all outpatient areas are scent-free.
Please refrain from wearing any cologne, aftershave or perfume.**



ENDOCRINOLOGY & DIABETES UNIT

PAPERWORK, GUIDELINES & GENERAL INFORMATION FOR STUDENTS, RESIDENTS & FELLOWS

GENERAL INFORMATION

There are three Clinics that operate within the EDU:

1. **DIABETES PROGRAM**—GREEN trimmed patient charts

Diabetes Clinics (Type 1 and Type 2) are held 4 days a week (Monday–Thursday) and provide service for diabetic patients exclusively.

Diabetes Program secretary, **Shaila Yap** (local 2868 or 7075):

- Receives phone calls via 875-2868, a direct-dial number for the Diabetes Clinic.
- Makes the initial and follow-up patient appointments.
- Maintains patient charts.
- Inputs lab results and other data into database.

Diabetes Nurse Educators **Sharleen Herrmann, Erica Vance, Janet Preston, Hannah Breadon, Jillian Creagh, Kim Nelson and Kristyne Withers** (Diabetes Clinic and Diabetes Day Program) provide nursing and patient/parent education site-wide for newly diagnosed and follow-up children with diabetes and their families.

2. **ENDOCRINE PROGRAM**—BLUE trimmed patient charts

Endocrine Clinics are held 4 days a week (Monday–Thursday) and address all endocrine and growth disorders but diabetes. Prader-Willi clinics are held twice a year (Dr. Stewart and Dr. Chanoine) on Fridays (usually in early April and late November/early December). There are also monthly outreach clinics held on Fridays in Kelowna (Drs. Chanoine, Amed and Hursh) and 3-monthly in Prince George (Dr. Chanoine) and twice a year in the Yukon (Dr. Metzger).

Endocrine Nurses **Mabel Tan, Rebecca Brooke, Janice Vanderspek, Stephanie Kemp, Susan Murphy and Kira Loeb** provide nursing for the Endocrine Program (clinic and inpatients) and the Gender Clinic, plus patient/parent education for children (and their families) with endocrine/growth problems.

Dietitian consultation is available on request. Ask staff about making a referral.

Two clerical staff members assist in the operation of the Endocrine Clinic:

- a) Endocrinology / Diabetes Receptionist, **Eva Tien** (local 7089)
- E-mail: endocrine@cw.bc.ca
 - Receive phone calls coming to 875-2117, the division's primary direct line.
 - Print out lab and/or x-ray reqs., directs patient to Lab, Radiology, Testing Room, etc.
 - Books Endocrine return appointments directly with patient/parent immediately following clinic.
 - Contacts families for return visits as per requests and/or follow-up booking.
 - Charts are not to be left on desks but must be filed by physician (resident, fellow) into the correct place. In clinic, place dictated charts in the “dictated” folder in the cart behind the Receptionist.

- b) Endocrine Program Secretary, **Aiden Ho** (local 3611):
 - o Receives phone calls via 604-875-3611, a direct-dial number for the Endocrine Clinic.
 - o Prepares clinic charts for the following week.
 - o Pre-registers clinic patients.
 - o Orders in-hospital charts for all patients seen in the Endocrine Clinic.
 - o Processes new referrals; assembles patient chart and contacts patient for their initial appointment.
 - o Maintains patient information in database.

3. **GENDER PROGRAM**—also uses BLUE trimmed patient charts

Gender Clinics are held on Tuesdays, Thursdays and Fridays. **Akira Imai** (local 5371) is the administrative staff member for the Gender Clinic.

ADDITIONAL TEAM MEMBERS

Additional staff members who provide support to the EDU clinics:

Dietitians:	Celise Bellamy (Diabetes Clinic) Tavia Moffitt (Diabetes Day Program and Inpatient)
Testing Room Nurses:	Medical Day Unit Nursing Staff
Social Worker:	EJ Link (Endocrine/Diabetes) Robyn Lalani (Gender Clinic) Kendall McSweeney (Gender Clinic)
Project Coordinator	Nancy Jin
Administrative Secretary:	Lisa Wong
Medical Transcriptionist:	Amanda Lamarche
Outreach Secretary:	Joy Witzsche
UBC Secretary	Daisy Yin

DICTATIONS

Helpful Hints for Dictation

- Be sure to put your name in the appropriate space of all clinic visit sheets.
- All diabetes dictations, referral letters, and discharge summaries are to be done through the M*Modal system (see next page). BCCH Pediatric Residents will use their pre-assigned User ID. Medical students and Adult Fellows will need to get a User ID from the Administrative Secretary.
- Endocrine clinic letters can be done either through Cerner using PowerNotes, or through M*Modal if desired for longer letters.
- Hold the phone at a constant distance from your mouth to prevent changes in volume.
- M*Modal letters are typed by our Transcriptionist using pre-set templates and macros. Therefore, it's very important to dictate information in the proper order (see below).
- Spell any proper names you use in your dictation (people, cities, names of schools or businesses, etc.).
- When mentioning a doctor, include first name/initials and location (e.g. "Dr. Joseph Smith in Kitimat").
- Keep the dictation focused, concise and to the point!
- Put a big "D" on the "Date of Dictation" spot on the clinic visit sheets to indicate that you've dictated the chart, and write in the Job ID (document number) returned to you by the M*Modal system.
- Referral letters to other doctors should be concise and do not need to include all of the clinic letter information, as a clinic letter will also be sent along with the referral letter.

Correcting Dictations:

When the dictation has been transcribed through Cerner PowerNotes or M*Modal, it will show up on your Home Page in Cerner PowerChart. Make all corrections in Cerner and submit the letter to the attending physician for final editing and signing. If you need assistance, the Transcriptionist can help you. Do not alter the format of the headers or text, as these are formatted in a very specific fashion for inclusion in the EHR. Do not include any symbols that are not on a standard keyboard.

INSTRUCTIONS FOR TELEPHONE DICTATION THROUGH M*MODAL

1. Lift the telephone handset & dial local 4799 (1-855-666-3240, toll-free from offsite)
2. Key in User ID, followed by the # key
3. Key in Facility Code, followed by the # key:

Profile:	Kind of Dictation
60	Diabetes
61	Endocrine

4. Key in Work Type:

Work Types:	Descriptions:
104	Consultation (for patients seen on inpatient wards on another service)
107	Discharge Summary (for an inpatient on our service or someone seen in Diabetes Day Program)
110	Referral Letter (for patients to be referred to another doctor or service)
111	Outpatient Clinic Note (for patients seen in Endocrine or Diabetes Clinic)

5. Key in the 7-digit Encounter Number (found on Admission Sheet or in Cerner), followed by the # key. For inpatients, use the day of admission encounter. Press 1 when prompted to confirm.
6. Press 2 to begin recording.
7. When dictation is complete, press 8 to end the report & begin dictating another report.
8. System will generate a Job ID (document number) for the report, write this on the clinic sheet.

Keypad Functions

- Listen: Press 1 to listen.
- Dictate/Pause/Restart: Press 2 to begin/pause/restart dictating.
- Rewind: Press 3 for an incremental rewind with auto playback.
- Fast Forward: Press 4 for fast forward.
- Complete/Disconnect: Press 5 to complete report and disconnect.
- Prioritize: Press 6 to mark dictation as Priority.
- Rewind: Press 7 to rewind to beginning of dictation.
- Complete/Start New: Press 8 prior to ending the report to indicate urgency.
- Playback: Press 9 to hear Encounter Number, Work Type, Job ID.
- #: Press # key to hear Job ID.

DICTATING TYPE 1 DIABETES CHARTS THROUGH M*MODAL

Basically, dictate the starred items on the Type 1 Diabetes Clinic Visit Sheet IN ORDER first:

- (1) BCCH#
- (2) Patient name
- (3) Date of visit
- (4) Date dictated
- (5) Physicians: (MAKE SURE THESE ARE ON THE VISIT SHEET!)
 - a. GP
 - b. Pediatrician
 - c. all other specialists
 - d. other 1-time cc's (parents, etc)

Then:

- (6) Insulin dose or pump settings)
 - (7) Blood glucose monitoring frequency
 - (8) Blood glucose readings
 - (9) Serious hypoglycemic events
 - (10) Milder hypoglycemic events
 - (11) Abnormalities on interval history

 - (12) History of Diagnosis
 - (13) Past Medical History
 - (14) Family History
- } FOR NEW PATIENTS ONLY
- (15) Flu shot?
 - (16) Last eye exam
 - (17) Other medications
 - (18) Interval labs (A1C, TSH, date)
 - (19) Social History
 - (20) Wearing ID, carrying hypoglycemic supplies?
 - (21) Abnormalities on Exam
 - (22) Labs: only those not on flowsheet (lipids, CBC, LFTs, free T4, IgA, etc)
 - (23) Recommendations made in clinic
 - (24) Follow-up (e.g. "6 months" or specific date or "pending labs")
 - (25) Resident/MSI/Fellow dictating

Example of final T1D clinic letter on next page.

We had the pleasure of seeing Danny recently in the Pediatric Diabetes Clinic at BCCH. As you will recall, he is a 15 0/12-year-old boy with type 1 diabetes, which was diagnosed in September 2001. He also has IgA deficiency.

He is managed on a regimen using Novolin insulin at the following dosages:
before breakfast: 23 units NPH 4-6 units NovoRapid
before lunch: -
before dinner: 10-12 units NovoRapid
at bedtime: 12 units Levemir

Danny checks his blood glucose (BG) 3 to 4 times a day. The CDA recommends a target range of 4-7 mmol/L for preprandial blood glucose (BG) values, and 5-10 mmol/L for 2-hour postprandial BG values, for individuals over 12 years of age.

On reviewing the logbook, the BG values are in the range of:
before breakfast: 4-6
before lunch: 6-12
before dinner: 4-12
at bedtime: 3-10
at 3 AM: none reported

On interval history, Danny has had no serious hypoglycemic episodes since the last visit. Milder hypoglycemia is occurring 3-4 times per week. He has been healthy with no intercurrent illness. On review of systems, there is no history suggestive of thyroid, adrenal or GI problems. There are no complaints of numbness or tingling in the extremities, nor are there any visual changes. He is not taking any medications.

On social history, Danny is in Grade 5 and likes to play baseball. He is doing his own fingerpokes and giving half of his injections.

On physical examination, Danny is a healthy appearing boy. The height is 162.0 cm (19 %ile, -0.9 SD for age). The weight is 52.1 kg (30 %ile, -0.5 SD for age). The body-mass index is 20.4 kg/m² (53 %ile, +0.1 SD for age). The blood pressure is 123/45 (86 %ile for SBP and 6 %ile for DBP, for age and height). The HEENT exam is normal. There is no thyromegaly. The chest is clear, and the heart sounds and pulses are normal. The abdominal exam is also normal. The GU exam was deferred. The neurological examination is grossly intact. The injection sites are normal.

Danny was also seen by the Diabetes Nurse Educator and the Diabetes Nutritionist. The mealplan is calculated at 2308 calories.

At this clinic visit, the following laboratory investigation(s) were performed: the A1C is 9.8% (non-diabetic normal 4.3-5.7%); this is equivalent to a mean plasma glucose of 13.0 mmol/L over the past 6-8 weeks. The ISPAD recommends a target A1C of <7.5% for all children and youth with type 1 diabetes. The TSH is 4.50 mU/L (normal 0.6-6.0).

We increased the morning NPH to 34 units. We suggested that Danny start to use his abdomen for injections.

Follow-up has been arranged for 6 months. We have given Danny's family a requisition to have an A1C drawn locally at 3-monthly intervals. We encourage all patients to have an interval visit with their family physician and/or pediatrician at the same time.

Thank you for allowing us to participate in Danny's care. Please do not hesitate to contact us should you have any questions regarding his diabetes management.

DICTATING DIABETES DISCHARGE SUMMARIES THROUGH M*MODAL

Use this when dictating on new patients who were inpatients or outpatients on the Medical Day Unit. Announce at the beginning that this is a Discharge Summary. Then, dictate using the order on the Diabetes New Patient Visit Sheet:

- (1) BCCH#
- (2) Patient name
- (3) Date of admission
- (4) Date dictated
- (5) Physicians: (MAKE SURE THESE ARE ON THE VISIT SHEET!)
 - a. GP
 - b. Pediatrician
 - c. all other specialists
 - d. other 1-time cc's (parents, etc)
- (6) Insulin brand (Humulin/Novolin), intermediate insulin (NPH), long-acting insulin (MAKE SURE THESE ARE ON THE VISIT SHEET!)

Then:

- (7) Date of discharge
- (8) Discharge Dx (type 1, type 2, etc)
- (9) History of present illness
- (10) Presenting laboratory results
- (11) Past medical history
- (12) Family history
- (13) Social history
- (14) Abnormalities on physical examination
- (15) Days spent in hospital and on MDU
- (16) Discharge insulin type and dosage
- (17) Follow-up (e.g. "6 months" or specific date or "pending labs")
- (18) Resident/MSI/Fellow dictating

Example of final diabetes discharge summary on next page.

DATE OF ADMISSION: 14-JAN-2015

DATE OF DISCHARGE: 18-JAN-2015

DISCHARGE DIAGNOSIS: type 1 diabetes, new-onset

HISTORY OF PRESENT ILLNESS: Danny is a 15 6/12-year-old boy who presents to the Medical Day Unit with a 2-week history of polyuria and polydipsia.

LABS: A random blood glucose was 23.4 mmol/L, and his urine had 4+ ketones.

PAST MEDICAL HISTORY: Danny has a history of asthma.

FAMILY HISTORY: Negative for T1D, T2D, thyroid or celiac disease.

SOCIAL HISTORY: Danny is in Grade 6 at Vancouver Elementary, and he enjoys soccer and playing guitar.

EXAMINATION: The height is 178.1 cm, and the weight is 64.2 kg. The exam was otherwise unremarkable.

COURSE: Danny's family spent 3 days with the Diabetes Nurse Educator and the Diabetes Dietitian for diabetes teaching. By the time of discharge, they were fully capable of looking after Danny's diabetes. For all children and youth with type 1 diabetes, Diabetes Canada recommends a target A1C of 7.5% or lower and a target blood glucose (BG) range of 4-8 mmol/L before meals and 5-10 two hours after meals.

DISCHARGE INSTRUCTIONS:

(For patients on conventional insulin therapy)

Danny was discharged on a conventional insulin regimen at an approximate dosage of 12 units of Humalog and 34 units of Humulin N before breakfast; 16 units of Humalog before dinner; and 24 units of Levemir at bedtime. Danny was placed on a fixed-carbohydrate diabetic mealplan. The family will communicate via email with the Endocrinologist-on-call for further insulin adjustment, until the blood glucose levels have stabilized.

OR

(For patients on MDI)

Austin was discharged on a basal-bolus insulin regimen at an approximate dosage of 12 units of Basaglar insulin at bedtime, and NovoRapid with meals and snacks. At the time of discharge from the Day Program, Austin's prandial doses were being calculated using an insulin-to-carb ratio of 12 units/gram and an insulin sensitivity factor of 4 units/mmol/L. The family will communicate via email with the Endocrinologist-on-call for further insulin adjustment, until the blood glucose levels have stabilized.

FOLLOW-UP: February 2, 2015 in the Type 1 Diabetes Clinic at British Columbia's Children's Hospital.

DICTATING TYPE 2 DIABETES CHARTS THROUGH M*MODAL

Basically, dictate the starred items on the Type 2 Diabetes Clinic Visit Sheet IN ORDER first:

- (1) BCCH#
- (2) Patient name
- (3) Date of visit
- (4) Date dictated
- (5) Physicians: (MAKE SURE THESE ARE ON THE VISIT SHEET!)
 - e. GP
 - f. Pediatrician
 - g. all other specialists
 - h. other 1-time cc's (parents, etc)

Then:

- (6) Medications
 - (7) Blood glucose readings
 - (8) Interval history

 - (9) History of Diagnosis
 - (10) Past Medical History
 - (11) Family History
- } FOR NEW PATIENTS ONLY
- (12) Social/Activity History
 - (13) Dietary notes
 - (14) Labs: only those not on flowsheet (lipids, CBC, free T4, IgA, etc)
 - (15) Recommendations made in clinic
 - (16) Follow-up (e.g. "6 months" or specific date or "pending labs")
 - (17) Resident/MSI/Fellow dictating

Example of final T2D clinic letter on next page.

We had the pleasure of seeing Danny recently in the Pediatric Type 2 Diabetes/Insulin Resistance Clinic at BCCH. As you will recall, he is a 15 0/12-year-old boy with type 2 diabetes, which was diagnosed in September 2001. He also has IgA deficiency.

He is taking the following medications(s):
metformin: 500 mg PO BID
lipids/BP meds: Lipitor 10 mg PO daily

On reviewing the logbook, the BG values are in the range of:
before breakfast: 4-7
before lunch: none reported
before dinner: 4-7
after dinner: 5-9

Interval History: Danny has been well since his last visit.

Diet/Exercise/Social History: Danny is in Grade 6 and keeps active with soccer. The mealplan is calculated at 2308 calories.

Exam:

height: 162.0 cm (19 %ile, -0.9 SD for age)
weight: 52.1 kg (30 %ile, -0.5 SD for age)
BMI: 19.9 kg/m² (51 %ile, +0.0 SD for age)
waist circumference: 75.3 cm (50-75th %ile for age)
BP: 123/45 (86 %ile for SBP and 6 %ile for DBP, for age and height)

There is no goitre. The chest is clear. Cardiovascular exam reveals normal heart sounds, normal pulses, and no murmur. Abdomen is soft and non-tender with no masses or organomegaly. The GU exam was deferred. Neurological and musculoskeletal exams are unremarkable.

At this clinic visit, the following laboratory investigation(s) were performed: the A1C is 6.7% (non-diabetic normal 4.3-5.7%); this is equivalent to a mean plasma glucose of 8.1 mmol/L over the past 6-8 weeks. The CDA recommends a target A1C of <7.0% for all children and youth with type 2 diabetes.

Recommendations: We had not made any changes in Danny's medication regimen.

Follow-up has been arranged for 6 months. We have given Danny's family a requisition to have an A1C drawn locally at 3-monthly intervals. We encourage all patients to have an interval visit with their family physician and/or pediatrician at the same time.

Thank you for allowing us to participate in Danny's care. Please do not hesitate to contact us should you have any questions regarding his diabetes management.

DICTATING ENDOCRINE CHARTS THROUGH M*MODAL

Try to use this method for longer notes only (generally new patients). The default for endocrine dictations is to use Cerner PowerNotes (see next page).

Basically, dictate the starred items on the Endocrine Clinic Visit Sheet IN ORDER first:

- (1) BCCH#
- (2) Patient name
- (3) Date of visit
- (4) Date dictated
- (5) Physicians: (MAKE SURE THESE ARE ON THE VISIT SHEET!)
 - a. GP
 - b. Pediatrician
 - c. all other specialists
 - d. other 1-time cc's (parents, etc)

Then:

- (6) History of Present Illness (program calculates age)
 - (7) Past Medical History
 - (8) Family History
 - (9) Social History
 - (10) Previous Investigations
- } FOR NEW PATIENTS ONLY
- (11) Interval History/ROS/Interval Labs
 - (12) Exam: program calculates height/length/weight/HC/BP %ile and SD, as well as BMI and BSA
 - a. height and/or length
 - b. growth velocity
 - c. weight
 - d. weight increase
 - e. head circumference
 - f. arm span, U:L segment ratio, sitting height
 - g. pulse, BP
 - h. rest of exam
 - (13) Labs
 - a. single labs, X-rays (program generates units)
 - b. tables (be specific, e.g. "GH testing with clonidine and arginine")
 - (14) Impression/Plan
 - (15) Follow-up (e.g. "6 months" or specific date or "pending labs")
 - (16) Resident/MSI/Fellow dictating

DICTATING ENDOCRINE CHARTS WITH CERNER POWERNOTES

Welcome to the Endocrine Clinic



The Endocrine Clinic was included in the Cerner eChart Ambulatory Project deployed to 18 ambulatory clinics across C&W. This “cheat sheet” will help you get started and facilitate creating your clinical documents within a standardized structure. These documents are known as “power notes.”

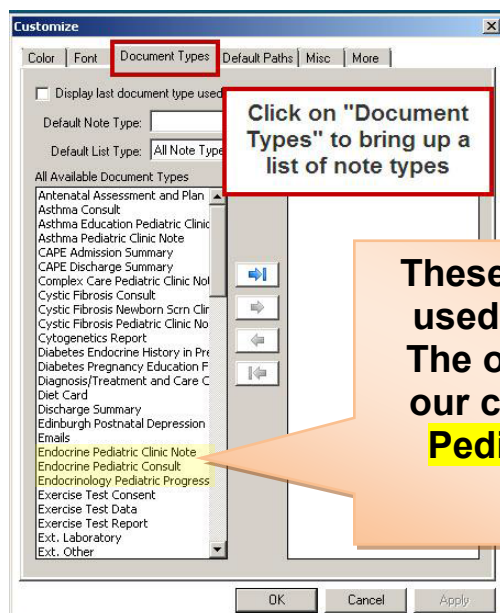
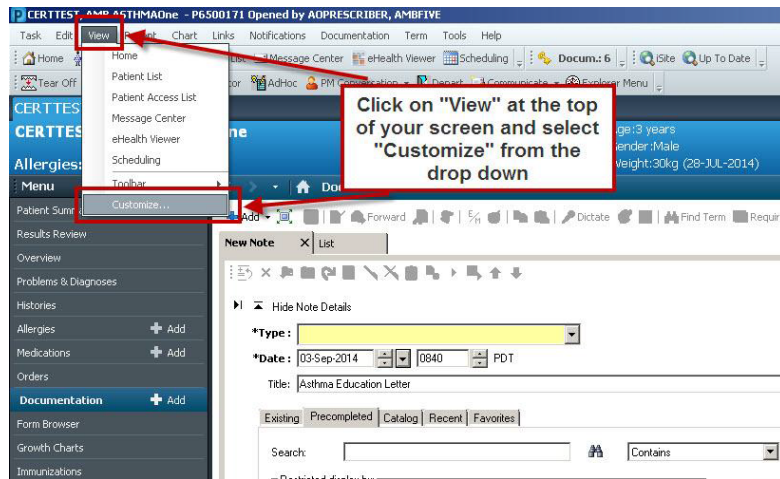
1. Quick Review

Before you start, review the separate document, *PowerChart Overview Quick Reference Guide*.

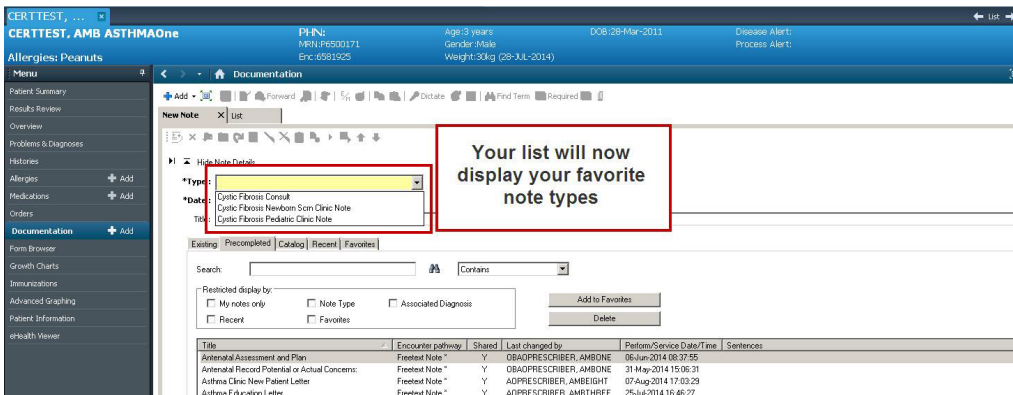
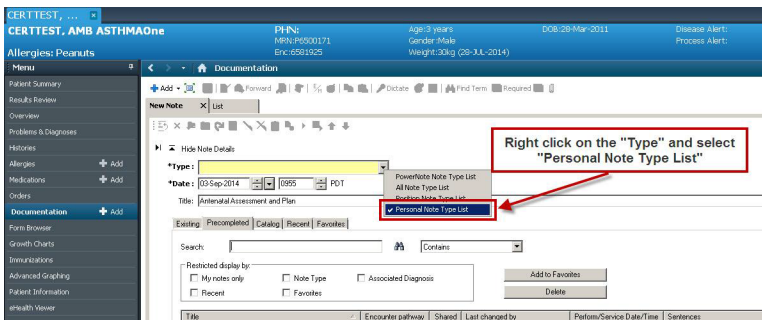
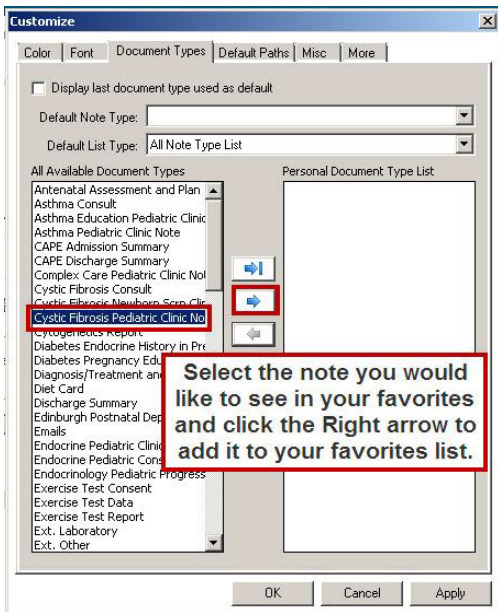
2. Create a Personal Note Type List

From inside a patient chart... Click on the Documentation tab

 and then “add”  to get to note templates.



These are the note types used in Endocrinology. The one you will use for our clinic is **“Endocrine Pediatric Clinic Note”**



3. Favorite Precompleted Notes

Now that you have selected the Note type, you need to choose your template. The clinicians in the Endocrine Clinic have created a series of standard 'Precompleted' notes that you should use in your documentation.

Existing Precompleted Catalog Recent Favorites

Search: Contains

Restricted display by:

My notes only Note Type Associated Diagnosis

Recent Favorites

Add to Favorites

Delete

Title	Encounter pathway	Shared	Last changed by	Perform/Service Date/Time
BCCH Endocrinology Female Bisphosphonate Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 12:01:15
BCCH Endocrinology Female CAH Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 11:58:40
BCCH Endocrinology Female Gender Dysphoria Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 12:14:07
BCCH Endocrinology Female General Endo Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 11:57:24
BCCH Endocrinology Female Hyperthyroidism Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 11:08:25
BCCH Endocrinology Female Hypocalcemia Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 11:15:52
BCCH Endocrinology Female Hypopituitarism Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 11:21:33
BCCH Endocrinology Female Hypothyroidism Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 11:25:35
BCCH Endocrinology Female New Patient Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 11:29:59
BCCH Endocrinology Female Obesity / PCOS / Hypercholesterolemia Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 11:34:25
BCCH Endocrinology Female Prader-Willi Syndrome Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 11:42:04
BCCH Endocrinology Female Precocious Puberty / Premature Adrenarche / Premature Thelarche Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 11:51:21
BCCH Endocrinology Female Short Stature / Delayed Puberty Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 11:53:22
BCCH Endocrinology Male Bisphosphonate Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 12:02:46
BCCH Endocrinology Male CAH Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 12:00:02
BCCH Endocrinology Male Gender Dysphoria Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 12:11:06
BCCH Endocrinology Male General Endo Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 11:05:33
BCCH Endocrinology Male Hypothyroidism Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 11:10:35
BCCH Endocrinology Male Hypocalcemia Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 11:19:16
BCCH Endocrinology Male Hypopituitarism Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 11:23:10
BCCH Endocrinology Male Hypothyroidism Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 11:27:07
BCCH Endocrinology Male New Patient Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 11:32:01
BCCH Endocrinology Male Obesity / Hyperinsulinism / Hypercholesterolemia Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 11:38:20
BCCH Endocrinology Male Prader-Willi Syndrome Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 11:45:49
BCCH Endocrinology Male Precocious Puberty / Premature Adrenarche Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 11:49:57
BCCH Endocrinology Male Short Stature / Delayed Puberty Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 11:55:44
BCCH Endocrinology Skeleton Template	Freetext Note *	Y	Hursh, Brenden Eugene	03-Oct-2014 12:09:29

which you want to create a note

Existing Precompleted Catalog Recent Favorites

Search: Contains

Restricted display by:

My notes only Note Type Associated Diagnosis

Recent Favorites

Add to Favorites


Delete

Title	Encounter pathway	Shared	Last changed by
BCCH Endocrinology Male Obesity / Hyperinsulinism / Hypercholesterolemia Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene
BCCH Endocrinology Male Prader-Willi Syndrome Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene
BCCH Endocrinology Male Precocious Puberty / Premature Adrenarche Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene
BCCH Endocrinology Male Short Stature / Delayed Puberty Follow-up Note	Freetext Note *	Y	Hursh, Brenden Eugene
BCCH Endocrinology Skeleton Template	Freetext Note *	Y	Hursh, Brenden Eugene
Complex Care Follow Up Patient Consult Letter	Freetext Note *	Y	Chow, Mini
Complex Care New Patient Consult Letter	Freetext Note *	Y	Chow, Mini
Cystic Fibrosis Clinic Note	Freetext Note *	Y	Hamilton, Sh
Cystic Fibrosis Clinic Note for Family	Freetext Note *	Y	Hamilton, Sh
Cystic Fibrosis Clinic Referral Letter	Freetext Note *	Y	Yang, Connie
Cystic Fibrosis Discharge Summary	Freetext Note *	Y	Hamilton, Shannon A
Cystic Fibrosis New Diagnosis Education Summary	Freetext Note *	Y	Hamilton, Shannon A
Cystic Fibrosis Newborn Screen Carrier Letter	Freetext Note *	Y	Hamilton, Shannon A
Cystic Fibrosis Newborn Screen Hypertypsinemia Letter	Freetext Note *	Y	Hamilton, Shannon A
Cystic Fibrosis Newborn Screen New Diagnosis Letter	Freetext Note *	Y	Hamilton, Shannon A
Cystic Fibrosis Transfer Summary	Freetext Note *	Y	Hamilton, Shannon A

Highlight the Endocrine notes and click on the 'Add to Favorites'

The endocrine notes now display in the favorites tab

4. Ok, you have set up your favourites, now it is time to review patient information and document the visit

- Click the Home Button 
- If you haven't done so already, you must add a staff name to generate your list of patients seen that day.

Home

Inbox Proxies Pools

Display: Last 90 Days

Inbox Items (0)

- Documents
- Messages (0/1)
 - General Messages (0/1)
- Orders

Work Items (0)

- Saved Documents
- Documents to Dictate
- Reminders

Notifications

Day View Calendar Patients for: No Resource Selected

Add Other...

Apply Cancel

no patients in the selected list

Click on the "No resource Selected" and select "Add Other..."

Resources Search

Search For:

metzger Find

Resources List:

Metzger, Dr. Daniel

OK Cancel

Search for the attending's name and click "Find"

Once you have found your attending, click on their name and click "OK"

- You will now have a list of that patient

Day View Calendar Patients for: Metzger, Dr. Daniel-

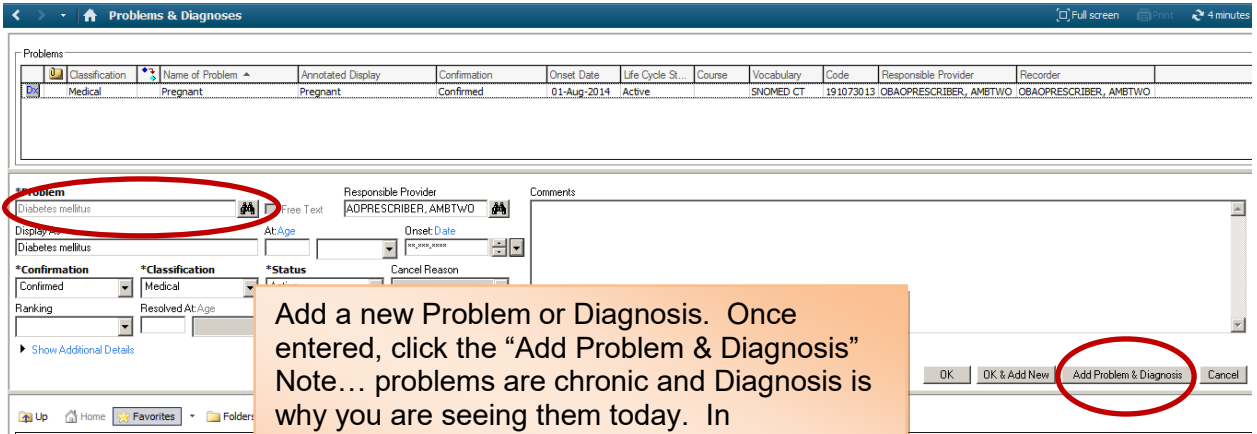
Full screen Print 1 minutes ago

Today January 14, 2015

Appointment Time	Patient	Appointment Details	Status	Notes
9:00 AM	Phsacertx, Two Informatics 20 years Female	BCCH Diabetes Type 1 F/UP	Confirmed	Reason for Visit: f/up
10:30 AM	phsacertx, Four Informatics 25 years Female	BCCH Diabetes Type 2 F/UP	Confirmed	Reason for Visit: f/up
1:00 PM	phsacertx, Five Informatics 28 years Female	BCCH Diabetes Type 1 New	Confirmed	Reason for Visit: new

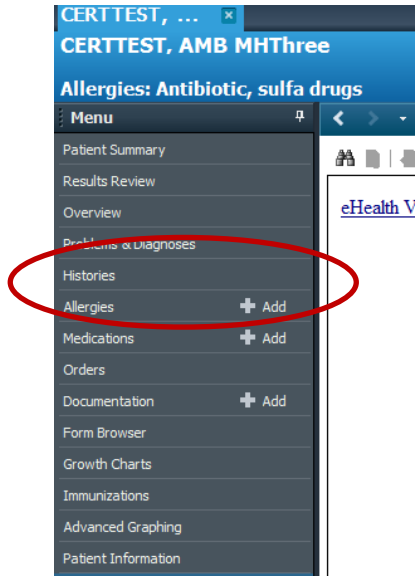
Ensure that this date matches the date of the appointment you are charting on.

- You may now click on the patient to open up their chart
- NOTE: It is important you select the patient from this list, so that the visit/encounter number will be correct! If you are seeing a patient that was not seen in clinic, refer to "QRG_Powerchert_Finding Encounters."**
- Once you have selected the patient from the day's list from menu on left, select **Problems & Diagnoses**



Add a new Problem or Diagnosis. Once entered, click the “Add Problem & Diagnosis” Note... problems are chronic and Diagnosis is why you are seeing them today. In Endocrinology, the problems and diagnoses are the same so click “add problem and diagnosis.”

- Check allergies and medications are up to date – nursing staff will usually have done this in the form browser. Modify as needed.





- From menu on left, select **Documentation**
- Select **Add Note**
- Select **Type: Endocrine Pediatric Clinic Note** from the drop down menu for any patient you see in clinic (new and follow-up). If you are unsure of what template to use, ask!
- **Highlight the template you would like to use** (Note: they are gender and disease specific. Also, there are also a general new patient and general follow-up template for each gender)
- **Important:** look up a few lines to the Title section: It will now reflect the name of the template you have chosen. **Change this title to BCCH Endocrine Follow-up (or New Patient) Note** (because, for example, you don't want the note called "BCCH Endocrine Male Hypopituitarism Follow-Up Note")
- **Change the date:** in the Date section: change the date to the date/time you saw the patient.
- **Note...** You can also use PowerNote to write a consultation note – just select **Endocrine Pediatric Consult** as the note type. You could use this for inpatient consultations.

Remember... if you set up your favourites, then the endocrine templates will also be in that tab

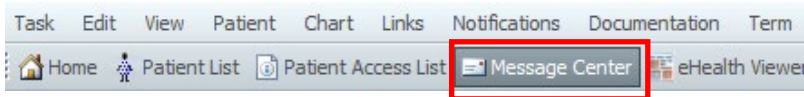
Title	Encounter pathway	Shared	Last changed by	Perfrom/Service Date/Time	Sentences
Antenatal Assessment and Plan	Freestext Note *	Y	OBAPREScriBER, AMBONE	06-Jun-2014 08:37:55	
Antenatal Record Potential or Actual Concerns:	Freestext Note *	Y	OBAPREScriBER, AMBONE	31-May-2014 15:06:31	
Asthma Clinic New Patient Letter	Freestext Note *	Y	ADPREScriBER, AMBEIGHT	07-Aug-2014 17:03:29	
Asthma Education Letter	Freestext Note *	Y	ADPREScriBER, AMBTHREE	25-Jul-2014 16:46:27	
CCL Smart Template Testing	Freestext Note *	Y	ADPREScriBER, AMBELEVEN	27-May-2014 11:32:20	
Complex Care Follow Up Patient Consult Letter	Freestext Note *	Y	ADPREScriBER, AMBTHREE	23-Jul-2014 14:33:35	
Complex Care New Patient Consult Letter	Freestext Note *	Y	ADPREScriBER, AMBTHREE	23-Jul-2014 13:50:23	
Cystic Fibrosis Clinic Note	Freestext Note *	Y	ADPREScriBER, AMBFOUR	01-Aug-2014 11:43:17	
Cystic Fibrosis Discharge Summary	Freestext Note *	Y	ADPREScriBER, AMBFOUR	01-Aug-2014 11:52:13	
Cystic Fibrosis Family Letter	Freestext Note *	Y	ADPREScriBER, AMBFOUR	01-Aug-2014 11:58:32	
Cystic Fibrosis New Diagnosis Education Summary	Freestext Note *	Y	ADPREScriBER, AMBFOUR	01-Aug-2014 11:59:59	
Cystic Fibrosis Newborn Screen Carrier Letter	Freestext Note *	Y	ADPREScriBER, AMBFOUR	01-Aug-2014 12:01:08	
Cystic Fibrosis Newborn Screen New Diagnosis Letter	Freestext Note *	Y	ADPREScriBER, AMBFOUR	01-Aug-2014 12:02:00	
Cystic Fibrosis Newborn Screen Hypertension Letter	Freestext Note *	Y	ADPREScriBER, AMBFOUR	01-Aug-2014 12:02:50	
Cystic Fibrosis Transfer Summary	Freestext Note *	Y	ADPREScriBER, AMBFOUR	01-Aug-2014 12:08:13	
Endocrine Clinic Follow-Up Note	Freestext Note *	Y	ADPREScriBER, AMBSOX	02-Oct-2014 11:09:32	
Endocrine Clinic New Visit Note	Freestext Note *	Y	ADPREScriBER, AMBFOUR	01-Aug-2014 12:19:44	

- Write note. F3 will take you from “_” to “_”. Remember, it's just a template to get you started. Add what's not there and remove what is not relevant!
- **Note...** Use the **Save** button regularly as PowerNote sometimes crashes when you try to delete information from the prefilled text. **This is a global known issue and IMITS is working to resolve.**

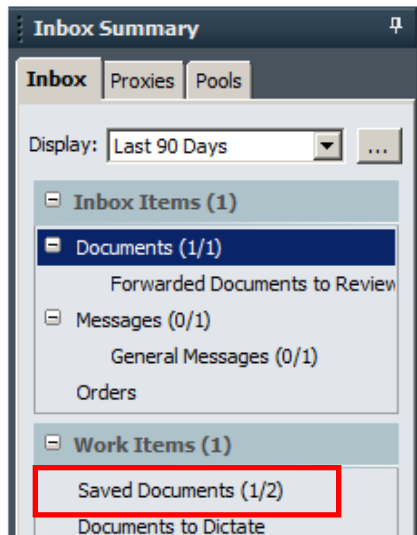
ATTENTION: PowerChart can stop responding if the  key is used to remove preformatted text when modifying Precompleted notes in PowerNotes.

Until the Cerner Technical Team creates a fix: please use the  key to delete unwanted text in any Precompleted PowerNotes.

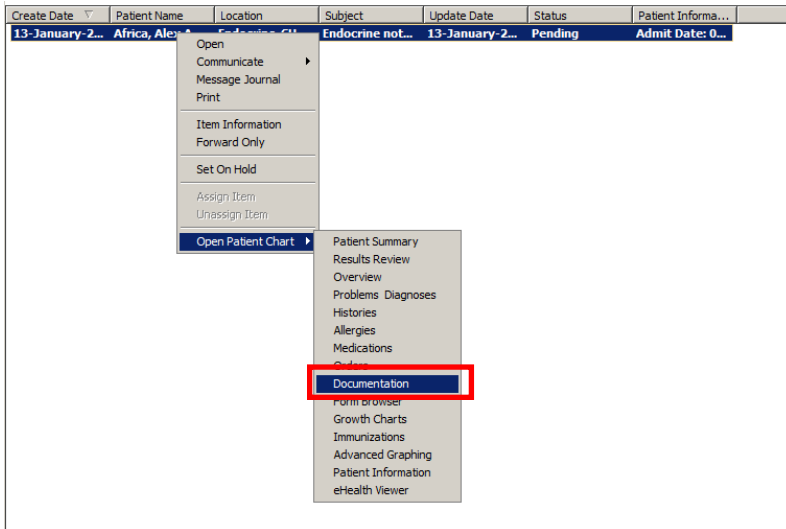
- Use **Save** function when you want to wait for blood results before finalizing note. You can re-edit note when results are back by opening the note directly from the patient chart, or from the message center in the top toolbar.



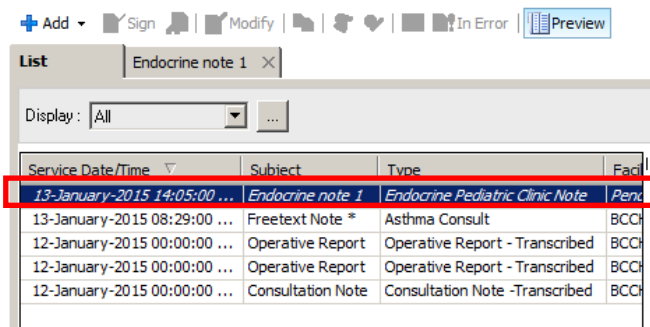
- To access the note from the message center, click on the “Saved Documents” tab on the side to view the list of your saved documents.



- Right click on the document you want to edit, and under “Patient Chart” select “Documentation”



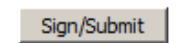
- Double click on the note you would like to modify. You may then make any necessary modifications to your note.



- When If you need to save the document, select the “Save” or “Save & Close” button



- Once you have completed your note, select the “Sign and Submit” button.



- Choose the **Endorser** as the consultant who saw the patient then select type as **‘sign’**.
- Finally, to add copy doctors on subsequent lines, enter as **Endorser** each physician to be cc’d on the note. These copy names are found on the visit sheet in the patient’s paper clinic chart. Select type as **‘review’** for each.
- Select **Submit** when you are done – the note will then go to the consultant to review and sign off. It will not come back to you.

• Ensure 'Type' and 'Title' are correct.
 • Select date and time of patient visit.
 • Select 'Request Endorsement' to send document to another provider for review or final signature. Providers can be found by clicking the binoculars to open the search window.
 • Click on 'Submit' or 'Sign' (dependant on the role and signing authority)

5. But What About My Diabetes Documentation?

PowerNotes are for Endocrine Patients Only - DIABETES PATIENTS NEED TO BE DICTATED BY PHONE

When you dictate, you have to reference the correct visit # (AKA – encounter #, FIN). Refer to “QRG_Powerchert_Finding Encounters.”

ORIENTATION TO NUTRITION MANAGEMENT FOR DIABETES TIPS FOR THE DOCTOR IN CLINIC AND ON-CALL

Dietitians in EDU:

Clinic:	Asia Miazga	local 7093	Pager: 41-01173
Inpatient:	Jill Middlemiss	local 7012	Pager: 41-01168

Managing newly diagnosed patients with type 1 diabetes:

There are 3 possible scenarios for a newly diagnosed child:

- The child comes to the Diabetes Day Program (DPP) with family straight from home, from GP's office or from the Emergency Room and not in DKA.
- The child comes to the DPP with family from another hospital. This is common on Monday, if they were admitted over the weekend or are from out of town.
- The child comes to Emergency and is admitted. Once they are stabilized, they are transferred to DPP for diabetes management education. Please see guidelines for ordering a diabetes diet for after hours or on the weekend.

When ordering a diabetes diet for new patients after hours/on the weekend:

- Doctor on call usually orders a "Diabetes Diet – New Diagnosis". Diet office implements a "standard" diabetes meal plan with set carbohydrate amounts according to the child's age. They will be able to select certain foods once they have met with the dietitian, after the weekend.
- MD order for "Diabetes Diet", no need to specific age or calories. The kitchen will assign the appropriate meal plan based on the child's age in the computer.

Diabetes Diet by Age	kcal	Breakfast (±5 g)	AM (±5 g)	Lunch (±5 g)	PM (±5 g)	Dinner (±5 g)	HS (±5 g)
4–8 months	1000	30 g	15 g	30 g	15 g	30 g	15 g
9–12 months	1800	45 g	15 g	60 g	20 g	60 g	15 g
1–3 years	2000	60 g	15 g	60 g	20 g	60 g	30 g
4–8 years	2200	75 g	15 g	75 g	20 g	75 g	30 g
9–13 years	2400	75 g	30 g	75 g	20 g	75 g	45 g
14–18 years	3000	90 g	30 g	90 g	45 g	90 g	45 g

Standard meal delivery times:

- breakfast 0800–0815 h
- lunch 1215–1230 h
- dinner 1700–1715 h

- Let the nurses know that if a patient is still hungry, they should receive more food. Extra starches and milk can be added to the meal plan. More protein and fat is fine. The meal plan can be increased by 200–400 kcal if necessary. Children are typically experience increased appetite when newly started on insulin and food should be adjusted for satiety. The standard meal plans have been created to account for this, but may not always be sufficient. If a patient requires more food than being provided on a weekend, please write order to "increase diet by X kcal/d" so that the kitchen will increase the carbs per meal. If it is a weekday, please contact the Day Program Dietitian for support.
- If the patient cannot finish a meal or snack, for example, if just starting to eat after admission in DKA, do not replace the food not eaten on the tray, especially if the blood sugars are a bit high (over 15 mmol/L). Blood sugars are tested often and insulin adjustment will be more appropriate than trying to force-feed the sick patient. If foods containing carbohydrates need replacement, offer carb-containing foods that the patient

feels s/he can eat: milk, bread/crackers/cookies and fruits/yogurt can be used as replacement. Protein, fats, and vegetables do not need replacement.

- If the patient is thirsty, offer water or request diet drinks (Crystal Light®) if no fluid restrictions.
- The Diet Office and the Clinical Diet Technician who visit the patients on weekends also have a copy of these guidelines.
- The EDU Inpatient Dietitian will see the patient on the next work day and readjust the diet as needed.

Nutrition training and disease management for the patient and family:

- The patient and family will spend **3–5 days** receiving treatment and teaching in the Diabetes Day Program located on the 2nd floor of the main Children's Hospital Building in an area called the Medical Day Unit (MDU).

At the end of the training sessions, the family should have obtained nutrition knowledge in:

- A structured mealplan to help with organizing food at home
- *Beyond the Basics*: portions and food choice guide
- Timing of meals/snacks and insulin action
- Importance and impact of regular physical activity and prevention of hypoglycemia
- Basic skills in nutrition label reading and recipe calculation
- Discharge meal plan and RDs charting is in both the hospital and ghost (clinic) charts

Notes for the pediatric resident on call when new patients are discharged home:

- Due to weight loss and hyperglycemia, the patient is usually very hungry the first 1–2 weeks after diagnosis.
- Patient is likely to be more active than when in hospital so blood glucose levels may start going down more rapidly than in hospital due to resuming normal daily activities.
- The patient often needs to decrease the meal plan once appetite has slowed down and as recovery weight gain is achieved.
- Honeymoon phase (recovery phase for the residual β cells) means that the patient will start producing some insulin, and insulin requirements will fall, often rapidly.
- Any of the above situations may lead to hypoglycemia if not taken into consideration when insulin adjustment is done over the phone the first 2–3 weeks after discharge.

Diabetes clinic charts:

Each visit is documented on a separate yellow form. There is a section for RD on the 2nd page.

- Usually details meal pattern and state caloric level of the mealplan
- Not all patients use a mealplan to manage his/her food
- The mealplans are **guidelines**
- Documents changes made, suggestions and educated provided

What the RD does in the clinic for patients with type 1 diabetes:

Goals are: 1) adequate energy for growth; 2) food of 'good quality', adequate micronutrients and minerals for growth; 3) promote enjoyment and interest in food (not to set up struggles or food fights between parents and child; 4) euglycemia; and 5) promote interest and self-efficacy in disease management (NOT ranked by importance).

RD follow-up (by phone or clinic visit) is warranted in the following situations:

- Sporadic and/or inconsistent meal/snack times
- Changed insulin regimen
- Lack of nutrition knowledge to accurately estimate carbohydrate content in foods while on pump on MDI
- Frequent hypoglycemia (both mild and severe)
- Transitioning between major life milestones (preschool to elementary, elementary to high school, high school to college to living on own)
- Excessive weight gain, weight loss and poor growth
- Unable to achieve target A1C
- Food habits that increase risk for inadequate nutrients (i.e. no vegetables, no dairy, picky eaters, food restrictions due to religious needs, allergies and vegetarianism)
- Risk of or presented with disordered eating
- Feeding behaviour challenges (i.e. refusal to eat, extreme picky eaters)
- Use of alternative health products (herbal, vitamin, mineral and protein supplements)

Activity, food and insulin:

- Extra physical activity burns calories/food and makes insulin more efficient.
- May result in hypoglycemia during or post-activity or delayed lows up to 8–12 hours later.
- Conversely, some kids may notice that adrenaline will increase blood sugar.

General recommendations for activity:

- Add 15 g of CHO from starches for 1 hour extra physical activity or about 10 g CHO for ½ hour.
- For strenuous activity (swimming, competitive sports, outdoor sports in cold weather), add protein and/or fat.
- Add extra food to regular snack.
- For prolonged indoor activity or hot weather, try sipping on ½-strength Gatorade® (mixed ½ with water) or G2 (50% of the sugar in normal Gatorade®).
- Don't exercise if BG is >15 mmol/L and/or urine/blood tests positive for ketones.
- For all-day activities (i.e. skiing, hiking, canoeing, camping), adjustment of insulin is likely required along with an adequate food plan (snacks, on-the-go foods, foods carried along to treat potential hypoglycemia).

Treatment of hypoglycemia:

- 5 grams for weight <15 kg, 10 grams for weight 15–30 kg, 15 grams for weight >30 kg
- Test BG again after 15 minutes, treat with fast-acting sugar again if BG ≤4 mmol/L.
- Eat only when BG ≥4 mmol/L.
- If meal is ≥30 minutes away, eat snack consisting of 1 starch and 1 protein (i.e. ½ sandwich or 1 Handi-Snacks® cracker and cheese).

Overnight hypoglycemia:

- There are many reasons leading to overnight hypoglycemia. In young children, it may happen more frequently. The use of uncooked cornstarch may help lessen the frequency of this. Uncooked cornstarch 'gels' in the stomach and slows the digestion of carbohydrate.
- Depending on age and taste/texture acceptance, our team usually starts anywhere from 2–3 teaspoons (5–7½ g) of uncooked cornstarch mixed into yogurt or cold milk, about 25–50% of the carbohydrate component of the evening snack. If this is not tolerated, then

we can try a solid food containing cornstarch, e.g. Rice Krispies® squares with added cornstarch.

Insulin pumps: there are 3 brands of insulin pump:

- Medtronic
- OmniPod

Please be familiar with these terms:

- ISF, insulin sensitivity factor, or correction factor
- Insulin-to-carbohydrate ratio or “carb ratio”
- Basal rate and temporary basal rate
- Bolus
- Square-wave or extended bolus
- Dual-wave or combo bolus

Carbohydrate counting:

This is one of the ways to quantify foods. The carbohydrate content of food serves as a frame of reference that helps the patient make decisions about insulin and/or food and activity adjustments. The ability to estimate carbohydrates is often not a skill the patient/family lacks but rather the willingness to take responsibility of diabetes and readiness/confidence to adjust insulin according to carbohydrate content and BG levels.

The knowledge is not difficult but patients need to be 1) ready and motivated to learn, 2) willing to practice the knowledge learned; and 3) willing to take responsibility and to take action on the information gathered through carb counting and current BG.

Goal is to accurately estimate carb content in single and combination foods. Trial and error of guessing carbs and its relation to post-prandial BG are crucial to learning. It is unlikely that the patient will be successful if s/he dislikes or refuses frequent BG testing (at least 4–6×/day). It takes a ‘scientific’ mind and a bit of ‘adventurous’ personality for this to work. Family and diabetes team supports are crucial in this process.

There is no single strategy to perfect carb counting. A combination of the following should be reviewed/taught:

- *Beyond the Basics*: food choices from Diabetes Canada
- the carb-counting module of our online insulin dose adjustment program (available at www.bcchildrens.ca/health-info/coping-support/diabetes/insulin-dose-adjustment)
- label reading (subtract fibre from carbs)
- use of a food scale
- use of online nutrient databases (www.nutritiondata.com, www.calorieking.com, [USDA website](http://USDAwebsite)) and apps (Carbs & Cals, MyFitnessPal)
- use of printed nutrient databases (books and references)

Type 2 diabetes in children:

Overweight and obesity, inactivity, and poor food choices are major factors leading to type 2 diabetes in children.

However, weight gains, behavioural and emotional challenges are often the tip of the iceberg and are symptoms of much harder-to-remedy issues, such as: unhealthy relationships in the family (between parents or between parent and child), poverty, financial difficulties, depression, lack of self-confidence, bullying by friends (at school or outside), loneliness, poor family lifestyle habits.

The whole family needs to be ready to make some changes before nutrition counselling will work. Identify the ‘real’ problem! You can speak about a food plan, give them ideas, tools to

manage but often unless the underlying issue is being dealt with at the same time, you won't go anywhere.

Approaches to facilitate lifestyle changes:

- goal-setting
- structured meal-plan
- portion awareness
- label reading
- increased support/frequent follow-ups either face-to-face or by phone

MODY or monogenic diabetes:

These are children whose pancreas don't normally sense the BG level and release insulin in response. They are usually of normal weight. In the early years, you try to distribute carbs evenly across the day and avoid sugary beverages and food so that their pancreas will not overwork. With time, this population may require insulin in adulthood, but the nutritional management is to delay overloading the pancreas with extra sugar, preserving its function for as long as possible.

References:

- Diabetes Canada 2018 Clinical Practice Guidelines: guidelines.diabetes.ca.
- Diabetes Canada Nutrition Handouts: www.diabetes.ca/professionals/resources/nutrition/basic-carb-counting/.
- Kaufman FR, Devgan S. Use of uncooked cornstarch to avert nocturnal hypoglycemia in children and adolescents with type I diabetes. *Journal of Diabetes and its Complications* 1996; 10(2):84–87.

INPATIENT CONSULTATIONS

If asked to do an inpatient or Emergency Room Consult, please notify the attending physician on service when you've completed the consult, so that you can see the patient together and complete the consult. Be sure to keep the back copy of all consultations done, once signed by the attending.

INPATIENT ADMISSIONS/DISCHARGES

New diabetes patients:

- If the patient will be coming to the Diabetes Day Program (DDP) on the Medical Day Unit, try to make sure that the family arrives at 8:00 AM and ask that the child not eat breakfast before arrival. If the patient will be coming from another hospital, then they should come immediately after the morning insulin and breakfast. Let them know that they will be at the hospital all day (8 AM to 5:30 PM) for a minimum of 3–4 days. Optimally, both parents should attend.
- Parents should be given this info sheet before being sent home, if possible: <http://www.bcchildrens.ca/endocrinology-diabetes-site/documents/ddp.pdf>
- Please make sure you get the patient's first and last name (with spelling if necessary), date of birth, and sex. Also, find out if there are special needs (interpreter, dietary requirements, or other medical/developmental problems).
- The following individuals need to be contacted that the patient is coming to the DDP, or if the patient is admitted in DKA:
 - the Medical Day Unit, 604-875-3680 (or local 3680)
 - the DDP Diabetes Dietitian, 604-875-2345, local 7012

- the DDP Nurse, 604-875-2345, local 7925
- the Diabetes Secretary, 604-875-2868 (or local 2868)
- the Social Worker, 604-875-2345, local 7091 (especially if urgent social, housing or financial issues)
- the fellow or staff physician on service the next morning (by e-mail or local)
- In your message to the nurse and dietitian, please relay the following information:
 - Patient's name, DOB, PHN
 - Expected arrival time at the DDP or relevant details
 - If child received insulin the night prior (if sent home from emerg)
 - Any immediate concerns
- If the patient is a known to have diabetes, it's best to contact the DDP Dietitian and Nurse, to be sure the patient has ample supplies for testing, a proper mealplan, etc. Diet order on ward for known-diabetes patients: "Diabetes Diet".

Discharge of newly diagnosed diabetes patients from DDP:

1. After receiving ~3 days of education from the nurse and dietitian, the families are discharged from the day program once the team feels they are ready.
2. They are given a discharge sheet (<http://www.bcchildrens.ca/endocrinology-diabetes-site/documents/diabetesdc.pdf>) with instructions and next visit date.
3. Families will communicate with the endocrinologists for changes to insulin doses via email with a fillable PDF document. Links to forms for patients on MDI and NPH. This form needs to be emailed to the family by the physician team on the final day of teaching to initiate the communication process. To send the email, you must be logged in to the DCNurse outlook email account.
 - Sign in to DCNurse account (dcnurse@cw.bc.ca). Login will be provided to you.
 - Open fillable PDF and complete patient information and current insulin doses
 - Click "Email to Patient". The subject line of the email must be "New Patient Log for [child's name]" in order to be received correctly by the team
 - Email to family and check that it was properly received prior to discharge
 - Let the family know what day they should complete and send in BG log (typically 2 days later).
4. Families will have a "BIH" visit (first clinic visit following DDP discharge) 4-6 weeks after discharge. They will be followed by up the diabetes team (physician, nurse, dietitian) every 3-6 months until their 18th birthday.

New endocrine patients:

- If a patient is admitted or seen in consultation that may require endocrine nursing teaching, or has a serious endocrine condition (panhypopituitarism, diabetes insipidus, CAH, etc), please notify:
 - the Endocrine Nurse Clinician at local 7927
- For patients requiring dietitian consultation, please complete a referral form and notify dietitians. Note that availability is limited and the patient may need to be rebooked to come back. EDU dietitians see both diabetes and endocrine patients, both as inpatients and outpatients.
 - call Inpatient EDU Dietitian at local 7012 to coordinate

Endocrine patients for discharge:

- Make sure that the Endocrine Nurse Clinician has completed her teaching, that the patient has all necessary prescriptions and supplies, and that there are clear arrangements for follow-up in place.

TELEPHONE TIPS FOR ON-CALL RESIDENTS & FELLOWS

The insulin pager is held by a fellow from 1300–1500 Monday–Friday. Parents are asked to call during this time if possible.

When you are *speaking to parents* regarding insulin doses for patients with newly diagnosed diabetes:

- Identify yourself and the reason for your call.
- Verify who you are speaking with and the child you are speaking about.
- If you are taking a call from a family *not on the daily call list*, be sure to write down the child's name and phone number and the Endocrinologist's name. Ask how to spell the name if you're not certain. Notify the Endocrinologist the next workday or by e-mail if there's an important issue.
- When asking parents about blood sugars:
 - obtain the readings for *before* the bedtime snack, breakfast, lunch and dinner
 - ask if there have been any low blood sugars
 - ask about any expected / planned changes to activity or food so you can take these into account when recommending insulin doses.
 - ask if they've checked for ketones for a blood sugar >15 without an obvious reason
- State the amount and time of each insulin that you want the parents to give (e.g. Tonight before dinner give 12 units of NPH and 4 units of NovoRapid).
- When two insulins are being given at the same time (e.g. NPH and NovoRapid before breakfast), *state the dose of long-acting insulin first*. Communicating insulin doses in a consistent order is intended to reduce confusion and mistakes.
- State the full name of each insulin, not abbreviations (e.g. say NovoRapid not NR, Humalog not H)
- Provide a short, simple explanation for the changes that you are recommending. (e.g. "Increasing the morning NPH will help bring down Sarah's blood sugars before dinner.) If you have time to do a bit more teaching, keep it short and simple, as these families are very new to diabetes and learning about basic insulin action.
- Always get the parent to **repeat back** the name, amount, and time of each insulin dose.
- If it's been a week or two, ask the parent if they have a suggestion before you give yours. Give positive feedback if they're making progress, but don't push them too much if they don't seem to be catching on.
- At the end of the call, tell the parent when you expect them to call back.
- If you do not intend to continue with daily phone calls, explain this to the parent but ensure they understand how to contact a nurse for subsequent phone calls. Nurses will work with parents to assist them with insulin dose adjustments for a limited period of time and will gradually teach parents how to adjust insulin on their own. Generally, we suggest sending an initial fax to nurses on Tuesdays or Thursdays. The nurse(s) will then contact the parent and arrange for a plan for follow-up.
- Ensure that the family knows they can still use the 24-hour pager for emergencies, especially lows or sick days.
- Please note: the nursing team's goal is to assist patients / families with insulin adjustments for a limited period of time. The long term goal is to build parents' knowledge and confidence to make adjustments independently, calling us for assistance

only when they need help. Nurses provide teaching during telephone calls and appointments.

FYI:

- It is expected that all residents and fellows complete our online insulin adjustment program (www.bcchildrens.ca/health-info/coping-support/diabetes/insulin-dose-adjustment) prior to their first night taking call. See below for more information.
- Numbers with area code 604 or 778 are generally local calls, **BUT** they can also be long-distance (e.g. Abbotsford). Numbers with area code 250 are always long-distance. The area code for the Yukon is 867, also long-distance. When you dial long-distance, you must first dial **1**. **NOTE:** Sometimes, long-distance calls will sound like a fast busy signal if you have not dialed 1 before the phone number. If you hear this, ensure that you dial 1 plus the full number.
- Parents may not tell you about extra blood sugar checks they have done if you only ask them for the standard pre-meal checks. It is often a good idea to ask if there have been any low blood sugars.
- Parents will progress at different rates with their understanding of insulin action and the need to change the insulin dose. Be polite when you are talking to them. Provide short, clear explanations of why you are recommending a specific change to insulin doses.
- When you “graduate” a parent from phone calls, please ensure they understand this does not mean they are being graduated from our program – it only means they do not need to continue with *daily* calls to the Dr. on call. Remind parents that they are to contact the diabetes nurse within a week to review blood sugars and insulin doses. **TIP:** Sometimes it is better to avoid using the term “graduate”. Instead, just tell the parents that their child’s insulin dose no longer needs to be changed daily and they can decrease the frequency of their calls. Then explain when and how to contact the nurse. (Phone and fax contact info is on all the education handouts as well as the label on the front of the yellow folder given to parents while they are in the Diabetes Day Program.)
NOTE: Residents must *not* graduate parents from daily phone calls; this must be done by EDU fellows or staff. Fellows are to discuss with, or inform staff of plans to graduate parents from daily calls. Please also inform clinic nurses; ideally send the child’s name and insulin dose to dcnurse@cw.bc.ca.
- When patients are discharged from the DDP they *do not yet have an insulin scale* for the rapid insulin. A scale is generally provided in person at the clinic follow-up visit. It is generally better to explain a scale in person, however, if you decide to prescribe a scale over the phone it is essential to:
 - briefly explain the purpose of the scale
 - keep the scale very simple (e.g. no more than 2–3 steps)
 - get the parent to write down and repeat back the exact scale
 - ensure they know how to use the scale
- Assess their understanding by giving them a few practice questions. For example, say: “I want to make sure you understand how to use the new insulin scale so I am going to ask you a few questions: “Using the scale, how much Humalog would you give Tina tomorrow morning if her blood sugar before breakfast is 14.2?” “How much Humalog would you give Tina tomorrow morning before breakfast if her blood sugar is 5.5?” “How much Humalog would you give Tina tomorrow before dinner if her blood sugar is 13.8?” Provide positive feedback and / or additional teaching as required.
- A few patients may be discharged from the DDP on basal-bolus insulin with basal Levemir or Lantus, and pre-meal injections of rapid acting insulin. These telephone calls are generally more involved as they require review of basal dose, correction factors and

carb ratios. Generally, if a newly diagnosed patient is put on basal-bolus, additional teaching time and follow-up will be arranged with one of the diabetes nurses and dietitians.

- If there seems to be serious knowledge deficits about basic diabetes management at home (i.e. poor understanding of hypoglycemia treatment etc), please advise one of the nurses so follow-up education can be arranged.

When you are *speaking on the telephone to MDU or Ward Nurses* regarding insulin orders for patients:

- Identify yourself and the reason for your call.
- Verify which child you are speaking about.
- State the *amount, type, time and route* of each insulin that needs to be given (e.g. “Give 10 units of NPH and 5 units of NovoRapid subcutaneously before dinner.”)
- State the full name of each insulin, not abbreviations (e.g. say NPH not N, Humalog not H, NovoRapid not NR, Lantus or Levemir not L, etc.)
- Ensure that the nurse knows the next time the child needs to be tested.
- **POLICY:** Telephone insulin orders must be heard / verified by **two nurses**. Each nurse will repeat the dose back to you. Otherwise, insulin orders need to be written in the chart by the doctor on service.

MDI ORDER EXAMPLE – FOR USE IN DIABETES DAY PROGRAM ONLY

(not to be used on inpatient wards)

You may find the following helpful when writing orders for children with diabetes who are receiving education in the diabetes day program in the MDU. Educators/nurses will calculate the insulin doses based on the order. Once orders are written you will not be paged with a BG before each meal unless otherwise specified in the order.

Basal: _____ insulin OD/BID at _____ (or specify separate doses and times)

Bolus: _____ insulin ac meals/snacks using following parameters:

Target pre-meal BG: _____ mmol/L (*6 for most kids*)

Breakfast: ICR _____ g and ISF _____ mmol/L

Lunch: ICR _____ g and ISF _____ mmol/L

PM Snack: ICR _____ g and ISF _____ mmol/L

Dinner: ICR _____ g and ISF _____ mmol/L

Important Considerations:

- If same ratios to be used throughout the day, may write “for all meals” or “for meals and snacks”
- Typically on first day in DDP, insulin is not given for snacks, but BG is checked and recorded. If needed, educators will typically request that you write an order for insulin with PM snack on subsequent days. Please check with RD and RN as able each morning.
- Families are taught not to give insulin to correct a high BG within 3 hours of the previous meal bolus (initially, may change once managing at home for a while), but may give insulin for food eaten. Typically, this means that a correction is not given with PM snack (no ISF used)
- If you are unclear on how to write orders, please check with the educators in the day program (RD/RN)

DIABETES LEARNING RESOURCES & LINKS

The following resources are available on our website. Please review each of them.

- **General EDU Website:** <http://endodiab.bcchildrens.ca>
- *Which Insulin Affects Which Blood Sugar?* This handout covers basic insulin action. www.bcchildrens.ca/endocrinology-diabetes-site/documents/whichins.pdf
- *Guidelines for Insulin Adjustment.* This handout covers basic principles for IDA based on pattern management. www.bcchildrens.ca/endocrinology-diabetes-site/documents/insadjgl.pdf
- *Insulin Dose Adjustment: An Online Education Program for Parents of Children with Diabetes.* This online program includes modules on basic principles for insulin dose adjustment, adjustments for physical activity, sick-day management, pumps, MDI and carb counting. www.bcchildrens.ca/health-info/coping-support/diabetes/insulin-dose-adjustment
- *Managing Sick Days and Preventing Ketoacidosis.* This handout covers the “5–10–15–20” rule for extra insulin during interval illness. www.bcchildrens.ca/endocrinology-diabetes-site/documents/sickdays.pdf
- *Insulin Pumper’s Guide to Managing High Blood Sugars and Preventing DKA.* This handout covers the management of high blood sugars and illness in pumpers. www.bcchildrens.ca/endocrinology-diabetes-site/documents/pumpdka.pdf
- *Insulin Pump Temporary Removal Guidelines.* This handout covers what to do when a patient has to come off pump because of a pump malfunction or for another reason. www.bcchildrens.ca/endocrinology-diabetes-site/documents/offpump.pdf
- *Mini-Dose Glucagon to Prevent Serious Hypoglycemia.* See this handout for sick-day management when a child is vomiting and unable to keep down foods / fluids. www.bcchildrens.ca/endocrinology-diabetes-site/documents/minigluc.pdf
- *An Introduction to Basal-Bolus Insulin with Multiple Daily Injections.* This handout, also available as a printed booklet, covers MDI. www.bcchildrens.ca/endocrinology-diabetes-site/documents/basalbolus.pdf

GUIDELINES FOR PERI-PROCEDURAL MANAGEMENT OF CHILDREN AND ADOLESCENTS WITH DIABETES WHO REQUIRE GENERAL ANESTHESIA

GENERAL GUIDELINES

The patient should be in good metabolic control and free of ketosis prior to surgery.

If the patient is in poor control, hyperglycemia and acidosis should be corrected and blood sugars stabilized before surgery.

Surgery should be scheduled first on surgical lists.

Insulin pumps:

The insulin pump is to be operated by a parent/guardian, the patient or the Anesthesiologist (if comfortable using the pump). A parent/guardian who is able to operate the pump must be present at all times prior to and post-surgery.

Types of surgery:

1. Minor surgery: To verify with Anesthesia, but usually <1 hour duration, with immediate ability to resume oral intake, e.g. endoscopies, jejunal biopsy, adenotonsillectomy.
2. Major surgery: To verify with Anesthesia, but usually >1 hour, and/or delayed ability to resume oral intake postoperatively. May require overnight hospital stay postoperatively.

TREATMENT OF HYPOGLYCEMIA

Mild-to-moderate hypoglycemia (conscious, oral intake possible):

1. Give **125 mL apple juice** (15 grams carbohydrates), **OR D10NS 5 mL/kg IV bolus** (0.5g/kg dextrose; maximum 250 mL, or 25 grams)
2. Start IV D10NS @maintenance rate immediately and recheck BG after 15 min.

Severe hypoglycemia (seizures, unconscious):

1. Give **1 mg glucagon SC or IM** (0.5 mg if child ≤5 years), **OR D10NS 5 mL/kg IV bolus** (0.5g/kg dextrose; maximum 250 mL, or 25 grams)
2. For patients on **insulin injections**:
 - a. start IV D10NS @maintenance rate immediately
 - b. recheck BG after 15 min
3. For patients on **insulin pump**:
 - a. start IV D10NS @ maintenance rate immediately
 - b. suspend or disconnect pump
 - c. recheck BG after 15 min
 - d. connect and restart pump once BG >6 mmol/L

ELECTIVE MINOR SURGERY: PATIENTS TREATED WITH INSULIN INJECTIONS

1. **Afternoon prior to surgery: Nurse to notify Endocrinologist on call** to decide if usual insulin dose should be given the night before (i.e. may consider reducing insulin dose if pattern of low BG values in the morning) and for insulin orders for the next morning:
 - Patients on NPH insulin: $\frac{2}{3}$ of usual morning dose of NPH subcutaneously.
 - Patient on Lantus or Levemir insulin: usual morning dose of Lantus or Levemir subcutaneously.

***The patient is instructed to receive morning insulin at the hospital (and not at home).**

2. Give usual bedtime snack the night before. Should be fasting for solids and non-breast milk as of midnight. Water is allowed up to 2 hours prior to surgery. A light breakfast is allowed for patients scheduled for afternoon surgery.
3. If BG is checked at home in the middle of night or morning and is <4 mmol/L, patient should receive 125 mL of apple juice or regular pop (15 grams carbohydrates)—**no** milk, honey or fruit juice containing pulp.
4. Upon arrival in day surgery, check BG hourly preoperatively. **Anesthesiologist to notify Endocrinologist on call if BG <4 or BG ≥ 15 mmol/L. If BG <4 mmol/L, treat for hypoglycemia (see page 3 for details)**
5. IV Access/Fluids:
 - If BG 4–5 mmol/L and symptomatic, start IV D5NS @ maintenance rate immediately (if asymptomatic, can start IV D5NS @ maintenance rate in the OR) and check BG after 30 min. Notify Endocrinologist (per point 4 above).
 - If BG 5–15 mmol/L, IV D5NS is not required unless BG drops to ≤ 5 mmol/L.
 - If BG ≥ 15 mmol/L, check urine for ketones. **Notify Endocrinologist-on-call** (per point 4 above).
6. Insulin: Give NPH/Lantus/Levemir insulin according to **Endocrinologist-on-call** orders from the night before surgery. **Do not give any Regular/Toronto or Humalog/NovoRapid/Apidra insulin unless BG ≥ 15 mmol/L and extra insulin is discussed with Endocrinologist-on-call.**
7. Check BG prior to surgery. Aim for BG 5–10 mmol/L during and after surgery.
8. Check BG post-operatively and then q4h and start oral fluids, popsicles. **Nurse to notify Endocrinologist-on-call** with BG results and for discharge instructions.

ELECTIVE MINOR SURGERY: PATIENTS TREATED WITH INSULIN PUMP

1. **Afternoon prior to surgery: Nurse to notify Endocrinologist-on-call** that patient is to have surgery the following morning.
2. Patient is to be continued on the same basal rate on insulin pump at home the night before, including overnight and morning basals.
3. Patient should be fasting for solids and non-breast milk as of midnight. Water is allowed up to 2 hours prior to surgery. A light breakfast is allowed for patients scheduled for afternoon surgery.
4. If BG is checked at home in the middle of night or morning and is <4 mmol/L, suspend pump and patient should receive 125 mL of apple juice or regular pop (15 grams carbohydrates)—**no** milk, honey or fruit juice containing pulp. Restart pump once BG >6 mmol/L.
5. Upon arrival in day surgery, check BG hourly preoperatively. **Anesthesiologist to notify Endocrinologist on call if BG <4 or BG ≥ 15 mmol/L.**
If BG <4 mmol/L, treat for hypoglycemia (see page 3 for details)
6. IV Access/Fluids:
 - If BG 4–5 mmol/L and symptomatic, start IV D5NS @ maintenance rate immediately (if asymptomatic, can start IV D5NS @ maintenance rate in the OR) and check BG after 30 min. Notify Endocrinologist (per point 5 above).
 - If BG ≥ 5 –15 mmol/L, IV D5NS is not required unless BG drops to ≤ 5 mmol/L.

- If BG ≥ 15 mmol/L, check urine for ketones. Notify Endocrinologist (per point 5 above).
7. Insulin Pump:
 - Keep insulin pump running at usual basal rates.
 - No insulin bolus should be given.
 - Ensure SC infusion site is secure to prevent dislodgement and interruption of insulin supply during procedure.
 - Ensure pump is unlocked so correction doses can be administered if needed.
 - **Do not give any correction doses of insulin with the pump or Humalog/NovoRapid/Apidra insulin unless BG ≥ 15 mmol/L and extra insulin is discussed with Endocrinologist-on-call.**
 8. Check BG prior to surgery. Aim for BG 5–10 mmol/L during and after surgery.
 9. Check BG post-operatively and then q4h and start oral fluids, popsicles. **Nurse to notify Endocrinologist-on-call** with BG results and for discharge instructions.

ELECTIVE MAJOR SURGERY: PATIENTS TREATED WITH INSULIN INJECTIONS

These patients should be admitted to hospital, with their surgeon as the most responsible physician, the day before surgery. Endocrinology and anesthesia consults are mandatory on admission. The following guidelines will be formalized as individualized orders for each patient by these two services.

1. **Afternoon prior to surgery: Consult to Endocrinologist-on-call** for admission orders for IV fluids and IV insulin. **Notify Pre-Admission Clinic Anesthesiologist, or Anesthesiologist-in-Charge (AIC)**, who will organize a pre-op anesthesia consult.
2. Give usual bedtime snack the night before. Should be fasting for solids and non-breast milk as of midnight. Water is allowed up to 2 hours prior to surgery. A light breakfast is allowed for patients scheduled for afternoon surgery.
3. If BG is checked in the middle of night or morning and is < 4 mmol/L, patient should receive 125 mL of apple juice or regular pop (15 grams carbohydrates)—**no** milk, honey or fruit juice containing pulp.
4. Immediately prior to transfer to OR, check BG preoperatively. **Notify Anesthesiologist of result at OR handover. Anesthesiologist to notify Endocrinologist-on-call if BG < 4 or BG ≥ 15 mmol/L. If BG < 4 mmol/L, treat for hypoglycemia (see page 3 for details).**
5. IV Access/Fluids: IV fluids from the wards to continue at maintenance rate.
 - If BG 4–15 mmol/L, continue same IV fluids and check BG q30 min.
 - If BG ≥ 15 mmol/L, continue same IV fluids but notify Anesthesia. Also check urine for ketones.
6. Insulin: **Anesthesiologist to adjust IV insulin.** Aim for BG 5–10 mmol/L preoperatively, during and after surgery by adjusting insulin infusion hourly. Recommended adjustment is $\pm 10\%$ of the current infusion rate.
7. Check BG every 30–60 min during the operation and while child is on IV insulin.
8. Check BG upon arrival in Recovery Room. Check IV fluid and rate as they often differ from pre-op orders. Adjust insulin infusion accordingly. Check BG hourly while patient is on IV insulin.
9. **Nurse to notify Endocrinologist-on-call** with BG when patient is in Recovery Room. Endocrinologist to decide if IV insulin is to be continued or patient is to be switched to SC insulin.

ELECTIVE MAJOR SURGERY: PATIENTS TREATED WITH INSULIN PUMP

These patients should be admitted to hospital, with their surgeon as the most responsible physician, the day before surgery. Endocrinology and anesthesia consults are mandatory on admission. The following guidelines will be formalized as individualized orders for each patient by these two services.

1. **Afternoon prior to surgery: Consult to Endocrinologist-on-call** for admission orders for pump suspension, IV fluids and IV insulin. **Notify Pre-Admission Clinic Anesthesiologist, or Anesthesiologist-in-Charge (AIC)**, who will organize a pre-op anesthesia consult.
2. Should be fasting for solids and non-breast milk as of midnight. Water is allowed up to 2 hours prior to surgery. A light breakfast is allowed for patients scheduled for afternoon surgery.
3. If BG is checked in the middle of night or morning and is <4 mmol/L, patient should receive 125 mL of apple juice or regular pop (15 grams carbohydrates)—**no** milk, honey or fruit juice containing pulp.
4. Immediately prior to transfer to OR, check BG preoperatively. **Notify Anesthesiologist of result at OR handover. Anesthesiologist to notify Endocrinologist-on-call if BG <4 or BG ≥15 mmol/L. If BG <4 mmol/L, treat for hypoglycemia (see page 3 for details).**
5. IV Access/Fluids: IV fluids from the wards to continue at maintenance rate.
 - If BG 4–15 mmol/L, continue same IV fluids and check BG 30 min after.
 - If BG ≥15 mmol/L, continue same IV fluids but notify Anesthesia. Also check urine for ketones.
6. Insulin: **Anesthesiologist to adjust IV insulin.** Aim for BG 5–10 mmol/L preoperatively, during and after surgery by adjusting insulin infusion hourly. Recommended adjustment is ±10% of the current infusion rate.
7. Check BG every 30–60 min during the operation and while child is on IV insulin.
8. Check BG upon arrival in Recovery Room. Check IV fluid and rate as they often differ from pre-op orders. Adjust insulin infusion accordingly. Check BG hourly while patient is on IV insulin.
9. **Nurse to notify Endocrinologist-on-call** with BG when patient is in Recovery Room. Endocrinologist to decide if IV insulin is to be continued or patient is to be switched back to insulin pump.

EMERGENCY SURGERY

1. No fluid food or medication by mouth.
2. Secure IV access.
3. Check weight, blood glucose, acid base status, blood β -hydroxybutyrate or urinary ketones.
4. If ketoacidosis present, call **Endocrinologist-on-call** to start DKA protocol. Surgeon, Anesthesiologist and Endocrinologist to liaise retiming of surgery, which should be delayed until DKA is controlled, unless the surgical risk of delay is deemed to outweigh the benefit of gaining control of DKA.

5. If stable and there's no ketoacidosis, can follow "elective surgery" guidelines for glucose and insulin.

TYPE 2 DIABETES

1. For those on insulin: to follow same "elective surgery" guidelines.
2. Patients on oral treatment:
 - **Metformin:** Discontinue 24 hours before procedure for elective surgery. If <24 hours since the last dose for emergent surgery, it is essential to maintain hydration with IV fluids before, during and after surgery.
 - **Sulfonylureas or thiazolidinediones:** Stop on the day of surgery. Monitor BG hourly and if ≥ 15 mmol/L, nurse to notify Endocrinologist-on-call to decide if insulin is indicated.

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