

Chronic Disease

Notes by Shaila Gunn

1. Recognize acute exacerbations of chronic diseases (and recognize that they can be the initial presentation)

Diagnosis	Risk factors	Presentation	Diagnosis	Treatment
Diabetic ketoacidosis	<p>1. Diabetes (particularly type 1)</p> <p>7 I's</p> <p>Infection</p> <p>Ischemic</p> <p>Intoxication</p> <p>Insulin (not taking)</p> <p>Iatrogenic (i.e. steroids, surgery)</p> <p>Initial presentation</p> <p>Impregnation</p>	<p>Hyperglycemia: polyuria, polydipsia</p> <p>Volume depletion: electrolyte imbalances, tachycardia, hypotension, dry mucous membranes, poor skin turgor</p> <p>Acidosis: hyperventilation, nausea and vomiting, impaired mental status, abdominal pain</p>	<p>Blood glucose > 13.8 mmol/L (diabetic)</p> <p>Ketonuria/ketonemia (keto)</p> <p>pH <7.3 (acidosis)</p> <p>Elevated anion gap</p> <p>HCO₃ <18 mmol/L</p> <p>**keep in mind a patient on SGLT2 inhibitors may be euglycemic**</p>	<p>1. Volume repletion with 0.9% NS +/- 20 mEq K/L.</p> <ul style="list-style-type: none"> - if shock: 1-2 L bolus - if not: 500 cc/hr x4 hours then 250 cc/hr - if glucose drops below 14 mmol/L need to at 5% dextrose <p>2. Insulin 0.1 U/kg/hr</p> <ul style="list-style-type: none"> - <i>must correct K first</i> as insulin drives K into cells and these patients are usually K deplete - if K > 5.2: start insulin - if K 3.3 – 5.2: add 20-40 mEq K to fluids then start insulin - if K >3.3 hold insulin until it is >3.3 using 20-40 mEq of K in your solution <p>3. Transition to SC insulin</p> <ul style="list-style-type: none"> - once the anion gap is closed, pH >7.3, and HCO₃ >15 mmol/L and patient is eating <p>4. Consider replacing other electrolytes:</p> <ul style="list-style-type: none"> - PO₄ if <0.323 mmol/L - Mg if < 1mmol/L - HCO₃- if pH <6.9 <p>5. Identify precipitating causes</p> <p>6. Avoid complications</p>
Hyperosmolar Hyperglycemic State	<p>Diabetes (usually poorly controlled or undiagnosed type 2)</p> <ul style="list-style-type: none"> - Insulin resistance - Inflammation + proinflammatory markers + counter regulatory hormones i.e. cortisol - Osmotic diuresis 	<p>Often an elderly individual with vague symptoms such as vague abnormalities in vitals and altered LOC</p> <ul style="list-style-type: none"> - Weakness - Anorexia - Dyspnea - Chest pain - Abdominal pain 	<p>Hyperglycemia (higher than DKA)</p> <p>Serum osmolarity > 315 mOsm/kg</p> <p>HCO₃ > 15 mmol/L</p> <p>pH >7.3</p>	<p>1. Volume resuscitation with fluid of your choice such as NS</p> <p>2. +/- insulin (not technically needed as this is to correct acidosis) may be considered if very high glucose</p> <p>Goal = glucose reduction of 2.8 mmol/L/hr</p>

	- impaired renal excretion of glucose Think of the 7 I's as triggers	- Volume depletion	Serum ketones negative or only mildly positive	
COPD exacerbation	Bacterial or viral infection (most) Hypoxia Cold weather B blockers Narcotics Sedatives/hypnotics	Hypoxemia presenting as tachypnea, tachycardia, hypertension, cyanosis, altered LOC Dyspnea: tripodding, pursed lips, using respiratory muscles Pulsus paradoxus (drop in SBP by >10 mmHG with inspiration)	24-48 hours increase in - Cough - Sputum - dyspnea	1. Correct tissue oxygenation - goal: maintain PaO ₂ >60 mmHg = SPO ₂ 90% - Supplemental oxygen - Non-invasive mechanical ventilation if worsening respiratory acidosis (pH <7.36, SPO ₂ <90%) or respiratory fatigue - Steroids for 5-7 days improve lung function and reduce time to recovery 2. Alleviate reversible bronchospasm - SABA: salbutamol q30-60 minutes - SAMA: ipratropium - continue long acting agent 3. Treatment of underlying cause - antibiotics if change in volume or increased purulence of sputum -> Outpatient: doxycycline or clarithromycin -> Inpatient: Ceftriaxone or cefuroxime + Doxycycline or Azithromycin **remember to treat the atypicals (legionella, mycoplasma pneumoniae, chlamydia pneumoniae)
Asthma exacerbation	Similar to COPD exacerbations	Shortness of breath Coughing Wheezing Chest tightness	Clinical diagnosis based on history and presentation	1. Supplemental O ₂ to maintain SPO ₂ > 90% 2. SABA q 20 minutes x3 via MDI with a spacer (or nebulizer) 3. SAMA if moderate to severe 4-8 puffs q 20 minutes x3 then PRN 4. If improvement with SABA and SAMA not sustained -> 40-60 mg prednisone PO or IV 6. MgSO ₄ 2g over 20 minutes if not responding

				<p>**have intubation equipment nearby**</p> <p>If after 1 hr symptoms have resolves and PEF is >80% they can go home. Otherwise, observe for 1-3 hours. If not improved, keep overnight.</p>
Acute heart failure	<p>FAILURES</p> <p>Forget medications</p> <p>Arrhythmia (i.e. Afib) or Anemia</p> <p>Ischemia/infarction/infection</p> <p>Lifestyle (diet/water)</p> <p>Upregulation i.e. hyperthyroid/pregnancy</p> <p>Renal failure (increase preload)</p> <p>Embolus (pulmonary) or COPD increase afterload</p> <p>Stenosis: aortic or renal leading to hypertensive crisis</p>	<p>-Dyspnea</p> <p>-Fatigue</p> <p>- PND</p> <p>- Orthopnea</p> <p>- Cough</p> <p>- Early satiety</p> <p>- Weight gain</p> <p>- Increased abdominal girth</p> <p>On exam</p> <p>- Positive AJR</p> <p>- Displaced apical impulse</p> <p>- Tachycardia</p> <p>- S3</p> <p>- JVD</p> <p>- Bibasilar crackles</p> <p>- Ascites</p> <p>- Hepatomegaly</p> <p>- Dependent edema</p>	<p>CBC abnormalities i.e. infection/anemia</p> <p>Electrolyte abnormalities (may be hyponatremic)</p> <p>Troponin to look for demand ischemic or MI (don't trend unless you suspect MI)</p> <p>BNP (to confirm diagnosis and compare to baseline)</p> <p>LFTs for congestive hepatopathy</p> <p>ABG if resp distress</p> <p>ECG for arrhythmia/ischemia/infarction</p> <p>CXR</p> <p>Echo, especially if none prior but also good to get prior to discharge for comparison</p>	<ol style="list-style-type: none"> 1. Telemetry 2. Keep SPO2 >90% 3. Diuresis with IV furosemide (double home dose keeping in mind at IV furosemide is twice as strong as PO) 4. Nitrates 5. Fluid and salt restrict (2L and 2g/day respectively) 6. Get daily weights and measure ins and outs! 7. Consider a foley in the elderly/frail as they will literally be peeing like a racehorse <p>**avoid morphine despite classical teaching as it increases mortality**</p>

Prevent exacerbations

- Assess medication and treatment plan adherence regularly ensuring it is feasible for patient and address any barriers
- Make sure patient understands how to use medications, for example, their inhalers
- Manage side effects of medications to help ensure adherence i.e. washing mouth after using inhaler, taking antihypertensives at night
- Have management plans in place for patients and ensure they know when to go to the hospital
- Educate patients on the important of treatment adherence
- Regular check-ins so that you can titrate medications and change treatment as needed

- Be proactive and ensure patient also has age-appropriate health screening to maintain optimal health
- Tips for patients who are struggling to maintain the treatment plan
 - o Ask what their barriers are and see how these can be mitigated
 - o Ask about finances and see if there are ways to get coverage
 - o Do they understand why the treatment is important? Educate them
 - o Are they having side effects? Help manage this

Table 12. Strategies to improve patient adherence

Assist your patient by:

- Tailoring pill-taking to fit patient's daily habits (Grade D)
- Simplifying medication regimens to once-daily dosing (Grade D)
- Replacing multiple pill antihypertensive combinations with single-pill combinations (Grade C)
- Using unit-of-use packaging (of several medications to be taken together) (Grade D)
- Using a multidisciplinary team approach to improve adherence to an antihypertensive prescription (Grade B)

Assist your patient in getting more involved in their treatment by:

- Encouraging greater patient responsibility/autonomy in monitoring their blood pressure and adjusting their prescriptions (Grade C)
- Educating patients and their families about their disease and treatment regimens (Grade C)

Improve your management in the office and beyond by:

- In patients with hypertension who are not at target, adherence to all health behaviour recommendations (including use of prescription medications) should be reviewed before adjustment in therapy is considered (Grade D; **revised recommendation**)
- Encouraging adherence with therapy using out-of-office contact (either phone or mail), particularly during the first 3 months of therapy (Grade D)
- Coordinating with pharmacists and work-site health caregivers to improve monitoring of adherence with pharmacological and health behaviour modification prescriptions (Grade D)
- Using electronic medication compliance aids (Grade D)

Modified and reproduced with permission from Hypertension Canada.

Consider the patients functional status

- Chronic disease impacts all aspects from the patient's life including functional and mental status
- Remember DEATH for ADL's
 - o **D**ressing
 - o **E**ating, or feeding self
 - o **A**mbulation, asking if they need a walker or if they hold walls when walking or transferring
 - o **T**oileting, including wiping sufficiently
 - o **H**ygiene, ability to bathe or shower self, brush teeth, etc
- Remember SHAFT for IADL's
 - o **S**hopping
 - o **H**ousekeeping or housework
 - o **A**ccounting or managing money
 - o **F**ood preparation
 - o **T**elephone use and transportation
- Screen for mood, suicide, and substance use

Resources

Chronic pain management tool: <https://tools.cep.health/tool/management-of-chronic-non-cancer-pain/>

Our episode on chronic pain: <https://thegenerehlist.ca/2021/05/16/ccfp-key-topic-chronic-pain/>