

# Maalmaha la Buko/Maamulka Ketone

## Waa maxay ketonadu?

Kiimikooyinka ketonadu waa shay wasakh ah oo ka soo baxa burburka dufanka ama baruurta. Marka jirkaagu uusan haysanin maaddada insulin oo ku filan si uu gulukooska ugu qaado unugyada oo tamar loogu soo saaro, unugyada ayaa gaajaysan. Waxuu jirku taas kaga jawaabaa burburinta baruurta si tamar looga helo, taasoo keeni karta in kiimikooyinka ketonadu ay galaan dhiiggaaga iyo kaadidaada.

## Maxaa jirka looga baaraa ketonada?

Baaridda ketonada ayaa **aad** muhiim u ah!  
Qiyaasta badan ee ketonada jirka ku jira ayaa keeni karta **badashada ashiitada cudurka sonkorowga (diabetic ketoacidosis) (DKA)**, taasoo darnaan karta.

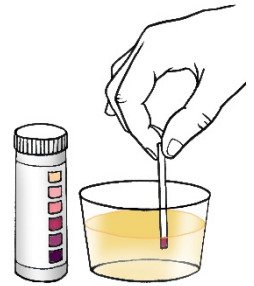
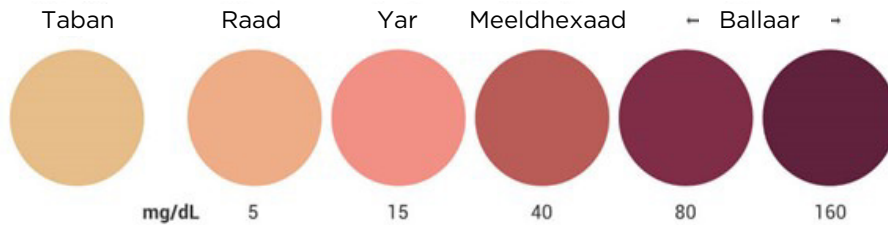
## Goormee jirka laga baaraa ketoonada?

- Marka gulukooska dhiiggu uu ka sarreeyo 250 mg/dL labo jeer oo isku daba xigta
- Marka ilmahaagu uu buko ama jirran yahay, si kaste ha noqdaan tirooyinka ama caddadyada gulukooska dhiiggu
- Marka ilmahaagu uu matagayo

## Sida kiimikooyinka ketonada looga baaro kaadida ama dhiigga

### Baaritaanka kiimikada ketone ee kaadida

1. Hal dhibic ee kaadi dul saar caarada afargeeslaha ah ee jeexa kiimikada ketone
2. Midabka jeexa ku eeg oo barbar dhig shaxda midabyada ee ku taalla dhalada sax ahaan ka dib 15 ilbiriqsi



Marka aad furto dhalo cusub ee jeexyada ketone taariikhda maanta ku dul qor dhalada. Marka la furo, waxay fiican yihiin oo la isticmaali karaa muddo 2 ilaa 6 bilood ah taasoo ku xiran shirkadda samaysay.

### Baaritaanka kiimikada ketone ee dhiigga

1. Jeexa ketone dhex geli cabbiraha oo dul saar hal dhibic ee dhiig
2. Cabbirka ama tirada cabbiraha ku eeg oo barbar dhig shaxda hoose

Taban, raad ama yar	Ka hooseeya 0.6 mmol/L
Meeldhexaad	0.6 ilaa 1.5 mmol/L
Ballaaran	Ka sarreeya 1.5 mmol/L



Cabbiraha ketone dhiig

### Si aad War dheeraad ah u Hesho

- Hormoonada  
206-987-2640
- Weydii bixiyaha daryeelka caafimaadka ilmahaaga
- [seattlechildrens.org/patient-education](https://seattlechildrens.org/patient-education)

### Adeegyo Afceliye Bilaash ah

- Isbitaalka gudihisa, weydii kalkaaliyahaaga.
- Isbitaalka dibaddiisa, soo wac Khadka Afcelinta Qoyska (Family Interpreting Line) ee bilaashka ah, 1-866-583-1527. Afceliyaha u sheeg magaca ama khadka gaarka ah ee aad u baahan tahay.



### Qiyaasta Insulin ee kiimikada Ketone

Marka ilmahaagu leeyahay ketones dhexdhexaad ah ama weyn, waxay u baahan doonaan insulin dheeraad ah si ay u nadiifiyaan ketones-ka. Iyadoo aan loo eegin haddii la isticmaalayo irbado ama bamka insulininta. Fadlan ka eeg jadwalka hoose ee tilmaamaha qiyaasta.

#### Ka baar kiimikooyinka ketone marka:

- Gulukooska dhiiggu uu ka sarreeyo 250 mg/dL labo jeer oo isku daba xigta, ama hadii kasarayso 300mg/ml wax kabadan 3 saacadood.
- Ilmuhu buko ama jirran yahay, si kaste ha noqdaan tirooyinka ama caddadyada gulukooska dhiiggu
- Ilmuhu matagayo

### Shaxda Qiyaasta kiimikada Ketone

Caddadka ketone	Tallaabada la qaadayo
<b>Taban, Raad ama Yar</b>	<b>Haddii gulukooska dhiiggu uu ka sarreeyo xadka:</b> <ul style="list-style-type: none"><li>• Sii qiyaasta daawada ee caadiga ah ee lagu saxo gulukooska dhiigga ku badan</li><li>• Cab biyo dheeraad ah</li><li>• Fiiri gulukooska dhiigga iyo kiimikooyinka ketonada 3dii saacadoodba mar ilaa kiimikooyinka ketonadu ay noqonayaan kuwo taban</li></ul>
<b>Meeldhexaad</b>	<b>Haddii gulukooska dhiiggu uu ka sarreeyo 200 mg/dL:</b> <ul style="list-style-type: none"><li>• Sii qiyaasta saxda ah ee daawadda <math>x 1.5 =</math> qiyaasta insulininta lasiinayo</li><li>• Cab biyo dheeraad ah</li><li>• Fiiri gulukooska dhiigga iyo kiimikooyinka ketonada 3 saac siina tan sacda ah ilaa kiimikooyinka ketonadu ay noqonayaan kuwo taban</li></ul> <b>Haddii gulukooska dhiiggu uu ka hooseeyo 200 mg/dL:</b> <ul style="list-style-type: none"><li>• Sii dareeryaal ama cabbitaanno sonkor leh sida Gatorade (ha ku darin daawada insulin)</li><li>• Dib u fiiri gulukooska dhiigga 15kii daqiiqaba mar ilaa gulukooska dhiiggu uu ka sarreeyo 200, ka dibna daawo insulin dheeraad ah u sii ketonada meeldhexaadka ah.</li></ul>
<b>Ballaaran</b>	<b>Haddii gulukooska dhiiggu uu ka sarreeyo 200 mg/mL:</b> <ul style="list-style-type: none"><li>• Sii qiyaasta saxda ah ee daawadda <math>x 1.5 =</math> qiyaasta insulininta lasiinayo</li><li>• Cab biyo dheeraad ah</li><li>• Fiiri gulukooska dhiigga iyo kiimikooyinka ketonada 3 saac siina tan sacda ah ilaa kiimikooyinka ketonadu ay noqonayaan kuwo taban</li></ul> <b>Haddii gulukooska dhiiggu uu ka hooseeyo 200 mg/mL:</b> <ul style="list-style-type: none"><li>• Sii dareeryaal ama cabbitaanno sonkor leh sida Gatorade (ha ku darin daawada insulin)</li><li>• Dib u fiiri gulukooska dhiigga 15kii daqiiqaba mar ilaa gulukooska dhiiggu uu ka sarreeyo 200, ka dibna daawo insulin dheeraad ah u sii ketonada ballaaran.</li></ul>

Haddii ilmuhu rabo in uu wax cuno, hubi in ay taasi tahay isla waqtiga aad siinayso qiyaasaha lagu saxo oo aanay ahayn waqtiyada u dhexeeya.

Haddii kiimikooyinka ketonadu ay weli ballaaran yihiin ka dib 6 saacadood, wac dhawaaqaha degdegga ee cudurka macaanka ama sonkorowga (diabetes urgent pager) ee lambarka 206-987-2000.

## Tallaabooyinka Maareynta Ketone ee Ku Saabsan Bambooyinka Insuliinta

- Haddii sonkorta dhiigu ay ka sarayso 250mg/ml saacado badan, beddel goobta duridda iyadoon loo eegin markii ugu danbaysay ee goobtaa la galiyay cirbadda. Goobta xun ayaa ah sababta ugu weyn ee bambaanada ketones ay san u soo saarayn qoraal sax ah.
- Haddii sonkorta dhiigu ay ku soo degi weydo 90 daqiiqo gudahood markaad beddesho goobta ka saar bamka, ka hubi ketones oo bixi cirbad gacanta ah adoo raacaya tillaabooyinka shaxda kore.
- Waxaad sii wadi kartaa daaweynta bamka 90 daqiiqo ka dib duritaanka. Haddii aad ku jirto nidaam otomaatig ah, sug ilaa qiyaasta xigta ee insulinta ay noqon doonto (3 saacadood).
- Bambooyinka qaarkood waxay bixiyaan muuqaallo kala duwan. Haddii kaaga uu sameeyo borotokool maalin jirro si uu u isticmaalo marka ilmahaagu buko ama uu leeyahay ketones, tan waxa laga hadli doonaa inta lagu jiro fasalka bilowga bamka.
- Nidaamyada otomaatiga ah waxay u baahan doonaan in laga saaro habka tooska ah ama la joojiyo gabi ahaanba marka la nadiifinayo ketones.
- Haddii bamkaagu xumaado ama jabo, la xidhiidh soo saaraha bamka isla markaaba.
- Ogow meesha aad ka heli karto macluumaadkaagii ugu dambeeyay ee qiyaasta haddii ay dhacdo in bamka uu xumaado, tani waa midda ugu dambeysa ee Booqashadaada Kooban ee laga helay MyChart, ama qaybta warbixinta ee arjiga taleefanka ee taageera bamkaaga.

Muhiim: Tilmaamahaan waxaa loogu talagalay inay la shaqeeyaan nidaamka bamka insulin kasta. Nidaam kasta oo gaar ah ayaa si kala duwan u maamula ketones-ka iyo maalmaha jirrada. Tani waxaa looga hadlay fasalkaaga bilowga bamka. Haddii aad wacdo, waa muhiim inaad u sheegto qofka aad la hadlayso inuu ogaado bamka ilmahaagu ku jiro iyo tillaabooyinka aad hore u qaadday si aad u yarayso ketones.

Saxiixa Bixiyaha: \_\_\_\_\_

Taariikhda: \_\_\_\_\_

## Marka Ilmahaaga Sonkorowga qaba uu bukoodo

### Marka ilmahaagu uu la buko qabaw ama hargab:

- Waxay u badantahay in Ketones-ka ay kobcaan si kasta oo ay yihiin lambarrada gulukoosta dhiigga. Heerarka guluukooska dhiigga ayaa laga yaabaa inay sare u kacdo sababo laxiriira jawaab celinta walaaca ee jirrada.
- Insuliin badan ayaa loobaahan karaa si looga ilaayo sonkorta dhiiga ama in lagu daaweeyo ketoones-ka.
- Waxaad u baahan doontaa inaad jidhka ku hayso insulin kugu filan iyo karbohaydraytyo si ay kaaga caawiso la dagaalanka caabuqa

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### Tilmaamahaan ama xeerashan raac marka ilmahaagu uu buko:

- **Fiiri gulukooska dhiigga 3dii saacadoodba mar** ilaa uu ilmahaagu yeelanayo kiimikooyin ketono taban muddo 24 saacadood ah
- **Fiiri kiimikooyinka ketonada 3dii saacadoodba mar** ilaa uu ilmahaagu yeelanayo kiimikooyin ketono taban muddo 24 saacadood ah
- **Fuuqa jirka ilaasho.** Ilmahaaga sii dareereyaal ama cabbitaanno badan.
- Marwalba sii daawo insulin oo waxqabad dheer (Lantus, Basaglar, Tresiba), xataa haddii ilmahaagu uusan wax cunayn
- Eego Shaxda Qiyaasta kiimikada Ketone ee ku taalla bogga 2 ee buugyarahan si aad u hesho tilmaamaha ku saabsan qiyaasta daawada insulin

### Marka ilmahaagu uu matagayo:

- Sii kabbashooyin yar yar (1 qaaddo weyn) ee dareereyaal ama cabbitaanno saafi ah oo sonkor leh (sida Ginger Ale ama Gatorade) 15kii daqiiqaba mar
- Haddii matag iman waayo ka dib 30 daqiiqo, kordhi qiyaasta dareereyaasha ama cabbitaannada oo gaarsii 2 wiiqiyadood ama ounces (1/4 koob) 15kii daqiiqaba mar
- Haddii mataggu dib u bilaabmo, nasi caloosha ilmahaaga saacad kale ka dibna dib ugu bilow qiyaasta yar ee dareereyaasha ama cabbitaannada
- Sii wad fiirinta ama hubinta gulukooska dhiigga iyo kiimikooyinka ketonada 3dii saacadoodba mar oo eego Shaxda Qiyaasta kiimikada Ketone ee ku taalla bogga 2 ee buugyarahan si aad u hesho tilmaamaha ku saabsan qiyaasta daawada insulin

### Waa maxay calaamadaha digniinta ee gargaar lagu doonto?

Tag Waaxda Degdegga (Emergency Department) haddii ilmahaagu leeyahay kiimikooyin ketono ballaaran iyo mid ka mid ah calaamadaha cudurka ee soo socda:

- Cadaadiska laabta
- Dhibaataada neefsashada
- Isbeddelka xaaladda maskaxda
- Xanuunka daran ee caloosha
- Ilmahaaga ayaa aad u fuuq yar oo lagama fiirin karo kiimikooyinka ketonada kaadida
- Ilmahaaga ayaa labo jeer matagay oo caloosha wax kuma xajin karo

Haddii aadan hubin mid ka mid ah tilmaamahan, fadlan wac lambarka 206-987-2000 oo xiriiriyaha telefoonka isbitaalka Children's ka codso in uu kuugu dhawaaqo kooxda cudurka macaanka ama sonkorowga.

# Sick Days/Ketone Management

## What are ketones?

Ketones are a waste product of fat breakdown. When your body does not have enough insulin to move glucose into the cells for energy, the cells are hungry. The body responds by breaking down fat for energy, which can result in ketones in your blood and urine.

## Why check for ketones?

Checking ketones is **very** important!  
A high level of ketones in the body can lead to **diabetic ketoacidosis (DKA)**, which can be serious.

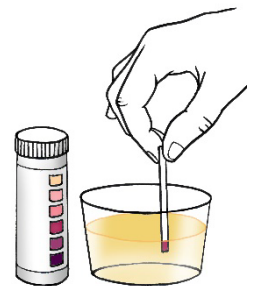
## When to check for ketones?

- When the blood glucose is over 250 mg/dL twice in a row
- When your child is sick, regardless of the blood glucose numbers
- When your child is vomiting

## How to check for ketones in urine or blood

### Urine ketone check

1. Apply a drop of urine onto the square tip of the ketone strip
2. Compare the strip color with the color chart on the bottle **in exactly 15 seconds**



When you open a new bottle of ketone strips write today's date on the bottle. Once opened, they are good for 2 to 6 months depending upon manufacturer.

### Blood ketone check

1. Put ketone strip into meter and apply a drop of blood
2. Compare the meter reading to the chart below

Negative, trace or small	Below 0.6 mmol/L
Moderate	0.6 to 1.5 mmol/L
Large	Above 1.5 mmol/L



Blood ketone meter

### To Learn More

- Endocrinology  
206-987-2640
- Ask your child's healthcare provider
- [seattlechildrens.org/patient-education](http://seattlechildrens.org/patient-education)

### Free Interpreter Services

- In the hospital, ask your nurse.
- From outside the hospital, call the toll-free Family Interpreting Line, 1-866-583-1527. Tell the interpreter the name or extension you need.



## Ketone Insulin Dosing

When your child has **moderate or large ketones**, they will need extra insulin to clear the ketones. Regardless of if using injections or on an insulin pump. Please refer to the table below for dosing guidelines.

### Check for ketones when:

- Blood glucose is over 250 mg/dL twice in a row, or if over 300 mg/dL for more than 3 hours.
- Child is sick, regardless of blood glucose numbers
- Child is vomiting

## Ketone Dosing Table

Ketone level	Action to take
<b>Negative, Trace or Small</b>	<p><b>If blood glucose is above range:</b></p> <ul style="list-style-type: none"> <li>• Give <b>usual</b> correction dose for high blood glucose</li> <li>• Drink extra water</li> <li>• Check blood glucose and ketones every 3 hours until ketones are negative</li> </ul>
<b>Moderate</b>	<p><b>If blood glucose is above 200 mg/dL:</b></p> <ul style="list-style-type: none"> <li>• Give <b>usual correction dose x 1.5 = insulin dose to give</b></li> <li>• Drink extra water</li> <li>• Check blood glucose and ketones every 3 hour and give corrections until ketones are negative</li> </ul> <p><b>If blood glucose is under 200 mg/dL:</b></p> <ul style="list-style-type: none"> <li>• Give sugary liquids like Gatorade (do not cover with insulin)</li> <li>• Recheck blood glucose every 15 minutes until blood glucose is above 200, and then give extra insulin for moderate ketones.</li> </ul>
<b>Large</b>	<p><b>If blood glucose is above 200 mg/mL:</b></p> <ul style="list-style-type: none"> <li>• Give <b>usual correction dose x 2 = insulin dose to give</b></li> <li>• Drink extra water</li> <li>• Check blood glucose and ketones every 3 hours and give corrections until ketones are negative</li> </ul> <p><b>If blood glucose is under 200 mg/mL:</b></p> <ul style="list-style-type: none"> <li>• Give sugary liquids like Gatorade (do not cover with insulin)</li> <li>• Recheck blood glucose every 15 minutes until blood glucose is above 200, and then give extra insulin for large ketones.</li> </ul>

If child wants to eat, make sure it is at the same time you are giving corrections and not in-between.

If ketones continue to be large after 6 hours, call the diabetes urgent pager at 206-987-2000.

## Actions for Ketone Management on Insulin Pumps

- If blood sugars are more than 250 mg/mL for \_\_\_\_ hours, change the injection site regardless of when last site was inserted. A bad site is the main cause of ketones on pumps.
- If blood sugar does not come down within 90 minutes of changing site remove the pump, **check for ketones** and give a manual injection following the steps on the chart above.
- You can continue with pump therapy 90 minutes after injection. if on an automated system, wait until the next dose of insulin would be due (3 hours).
- Some pumps offer different profiles. If yours does program a sick day profile to use when your child is ill or has ketones, this will be **discussed during your pump start class**.
- Automated systems will need to be taken out of automated mode or stopped completely while clearing ketones.
- If your pump has failed or is broken, contact your manufacturer right away.
- Know where to find your most recent dosing information in case of pump failure, this is either in your last **After Visit Summary** found in **MyChart**, or in the report section of the phone application that supports your pump.

**Important:** These guidelines are designed to work with any insulin pump system. Each individual system manages ketones and sick days differently. This is discussed in your pump start class. If you call, it is important to let the person you talk to know what pump your child is on and what actions you have already taken to reduce ketones.

Provider Signature: \_\_\_\_\_

Date: \_\_\_\_\_

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## When Your Child with Diabetes is Sick

### When your child is sick with a cold or flu:

- Ketones are more likely to develop no matter what the blood glucose numbers are. Blood glucose levels may rise due to the stress response of illness.
  - More insulin may be required to prevent or treat ketones
  - You will need to keep enough insulin and carbohydrates in the body to help fight the infection
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### Follow these guidelines when your child is sick:

- **Check blood glucose every 3 hours** until your child has negative ketones for 24 hours
- **Check ketones every 3 hours** until your child has negative ketones for 24 hours
- **Stay hydrated.** Give your child lots of liquids.
- Always give long-acting insulin (Lantus, Basaglar, Tresiba), even if your child is not eating
- Refer to the Ketone Dosing Table on page 2 of this handout for instructions on dosing insulin

### When your child is vomiting:

- Give small sips (1 tablespoon) of clear sugar-containing liquids (like Ginger Ale or Gatorade) every 15 minutes
- If there is no vomiting after 30 minutes, increase the amount of liquids to 2 ounces (1/4 cup) every 15 minutes
- If vomiting restarts, rest your child's stomach for another hour and then restart the small amount of liquids
- Continue checking blood glucose and ketones every 3 hours and refer to the Ketone Dosing Table on page 2 of this handout for instructions on insulin dosing

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### What are the warning signs to seek help?

Go to the Emergency Department if your child has large ketones and any of the following symptoms:

- Chest heaviness
- Trouble breathing
- Change in mental status
- Severe stomach pain
- Your child is too dehydrated to check for urine ketones
- Your child has vomited twice and can't keep anything down

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**If uncertain about any of these instructions, please call 206-987-2000 and ask the Children's operator to page the diabetes team for you.**