



diabetes
education
packet
FOR PEDIATRICS



Cottage
Children's
Medical Center



what to expect during your child's initial admission for diabetes

Our goal is to prepare you to care for your child when you leave the hospital.

- Parents need to remain at the bedside so you can actively participate in all education sessions. At least one parent must be present at each meal. You will learn how to test glucose and give insulin.
- Call room service to order your child's meal at least one hour before mealtime. We suggest you call for breakfast before 7 a.m., lunch by 11 a.m. and dinner by 4 p.m. This allows your nurses to prepare for a blood sugar test and an insulin shot before the meal.
- Children will participate with education based on their readiness and developmental age.
- If you are caring for other children, arrange for someone to care for them during hospitalization if possible. This will allow for more focused teaching moments.

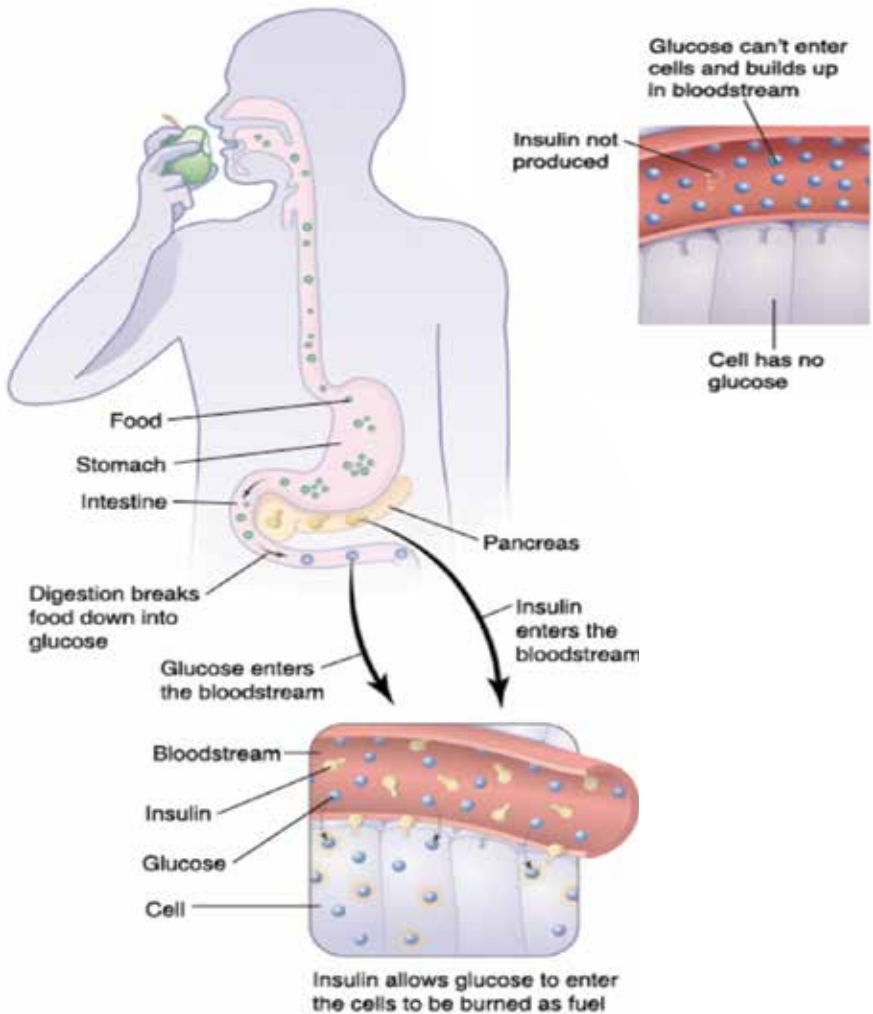
PRIOR TO DISCHARGE, THE FOLLOWING DIABETES CARE SKILLS NEED TO BE DEMONSTRATED.

- Know when and how to test blood sugar
- Count carbohydrates before meals
- Calculate insulin dose
- Give insulin shot
- Verbalize when and how to check ketones
- Verbalize how to treat a low glucose
- Know when and how to give emergency glucagon

You will receive more education at your first outpatient clinic visit.

understanding diabetes and insulin

Diabetes = high blood sugar



HOW THE BODY NORMALLY GETS ENERGY

1. After you eat, digestion breaks down carbohydrates from your food into a fuel called glucose (a type of sugar).
2. Glucose leaves the digestive system and enters the bloodstream. This starts to raise the body's blood sugar level.
3. Glucose travels to the cells to be burned as fuel. When it arrives, it needs help to get into the cells.
4. For glucose to enter the cells, insulin is needed. Insulin is a hormone made by the pancreas.
 - Insulin works like a key to unlock the cells, so sugar can get into the cells and give your body energy and keep your blood sugars level.

WHEN YOU HAVE TYPE 1 DIABETES INSULIN DEFICIENCY

- Your pancreas stops making insulin.

WHY TYPE 2 DIABETES IS DIFFERENT INSULIN RESISTANCE

A person with Type 2 Diabetes is still making insulin. Their body isn't able to use insulin the correct way.

- Without insulin, glucose can't enter the cells to be burned for energy.
- The sugar builds up in your bloodstream causing higher and higher blood sugar levels (hyperglycemia).
- Without insulin to allow glucose to enter the cells, the body has to burn fat instead. Burning fat produces a waste product called ketones.

insulin types and actions

- There are two different types of insulin that your child will receive to treat Type 1 Diabetes. They are rapid acting insulin and long acting insulin (basal insulin).

- **RAPID ACTING INSULIN = HUMALOG/NOVOLOG/ADMELOG**

- This insulin is given at meal times or with a snack. It is also used to treat high blood sugars.

HUMALOG = HUNGRY

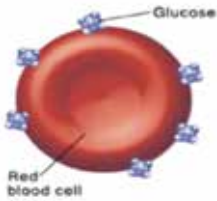
- **LONG ACTING INSULIN = LANTUS/BASAGLAR/TRESIBA**

- This insulin should be taken at the same time every day. Usually this is at dinnertime. If you usually take your shot at 9 p.m. then you can inject as early as 8:30 p.m. or as late as 9:30 p.m.

LANTUS = LONG

HUMALOG (LISPRO OR NOVALOG (ASPART))	Onset 5-10 minutes	Peak 60-90 minutes	Duration 3-4 hours
LANTUS (GLARGINE)	Onset 1-5 hours	Maximum effect may be seen at 3-9 hours. (may have peak)	Duration 22-24 hours
LEVEMIR (DETEMIR)	Onset 1-5 hours	Maximum effect may be seen at 3-9 hours. (may have peak)	Duration up to 24 hours (may require 2 injections per day)

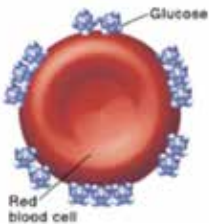
hemoglobin a1c



Healthy red blood cells have some glucose stuck to them.

HbA1c less than 5.7%

Blood glucose
70-120mg/dl



When your child has high blood sugar, much more glucose sticks to the red blood cells. This is what the A1c test measures.

WHAT IS THE HEMOGLOBIN A1C (HBA1C) TEST?

- Average blood sugar for the past three months.
- Measures the amount of glucose (sugar) that sticks to a protein called hemoglobin.
- Hemoglobin (Hb) is found in red blood cells and carries oxygen.
- More glucose sticks to the blood cells when blood sugars are high.

WHAT DOES THE RESULT MEAN?

- Normal HbA1c for a person without diabetes is less than 5.7%.
- The goal for children with Type 1 Diabetes is less than 7%. This is an average glucose goal of less than 154mg/dl.
- Your child will likely need an A1c test about once every three months.
- The A1c test tells you if your child's diabetes is well controlled.

checking your blood sugar

WHEN TO CHECK

- Four times a day or more (when you wake, always before meals, and at bedtime). Also before vigorous exercise.
- Anytime symptoms of a high or low blood sugar are felt.
- During times of illness or vomiting.
- Occasionally during the night, including if your insulin dose was recently changed.

HOW TO CHECK

1. Wash hands with soap and warm water. Dry your hands.
2. Get poker ready and insert the lancet (change your lancet every time you check your blood sugar).
3. Poke the side or tip of the chosen finger (not the ball of the finger).
4. To get enough blood, hold your hand down (below the heart) and gently “milk.” Do not over milk the finger; this could cause an inaccurate reading.
5. Put the first drop of blood on the test strip and wait for the result.
6. Apply tissue or cotton to stop the bleeding.

RECORD KEEPING

- It is important to keep a record of your blood sugars for your doctor to review.
- Bring all meters and logs to each clinic visit.
- Ask your child’s school to fax or email the clinic all recent blood sugar numbers if they are being recorded on a different meter.
- Set all meters with the correct date and time.

giving insulin injections with a single vial

- Wash hands with soap and warm water.
- Get the insulin, a syringe (6mm needle length or less) and alcohol swabs.
- **Double-check that the correct insulin is being used (long vs. rapid acting) and that it is not expired.**
Insulin is good for 28 days once it is opened or is at room temperature. Write the date opened on the bottle.
- Clean the top of the bottle with an alcohol swab.
- Pull back the plunger of the syringe to draw air into the syringe and inject it into the bottle. This puts pressure into the bottle and makes the insulin easier to draw out.
- Turn the bottle upside down (leaving the needle in the bottle) and draw out the correct amount of insulin.
- Check to make sure there are no air bubbles in the syringe.
- Double check with another person that the correct amount of insulin is in the syringe.
- Clean the skin with alcohol or wash with soap and water.
- Holding the syringe like a pencil, insert the needle straight into the skin (do not inject at an angle and do not rest your finger on the plunger). Push in the plunger.
- Wait 10 seconds before removing the needle from the skin.
- Dispose of the syringe, without recapping it, in a puncture-proof container.

Insulin must be stored so that it does not freeze or get over 90 degrees, as it will spoil. **DO NOT** store in the car. Okay to store at room temperature for 28 days once open.



INJECTION SITES

Insulin should be injected into the fatty tissue under the skin of the:

- Upper arms
- Abdomen
- Thighs
- Upper buttocks/hips

To avoid shrinkage (atrophy) and overgrowth (hypertrophy) of the fatty tissue, a different spot should be selected for each injection. Insulin may not be absorbed well if injection sites are puffy or hard.

instructions for injections using a **pen**

1

Wash your hands and gather supplies:
insulin pen, pen needle and alcohol swab.



2

Remove the pen cap.



3

Wipe stopper with alcohol swab.



4

If insulin is cloudy, roll the pen (do not shake)
in your hands and turn from side to side for
one full minute. Rolling is not necessary if
insulin is completely clear.



5

Attach new pen needle to pen.



6

Pull off the outer and inner needle caps.



7

Priming the pen—check the flow of the insulin by dialing two units and press the button until you see the insulin come out. Repeat if necessary.



8

Select the dose of insulin and dial your pen to the selected insulin dose.



9

Prepare the injection site by cleaning with alcohol swab. Inject straight in at a 90° angle. Press the button down and count for 5-10 seconds before removing the needle from your skin.



10

Place the outer cap on the needle and remove the disposable needle from the pen. Throw the needle away in a sharps container. Replace pen cap.



instructions for injections using a **vial** (bottle) and **syringe**

1

Wash your hands and gather supplies: insulin bottle, syringe and alcohol swab.



2

If insulin is cloudy roll the bottle (do not shake) in your hands and turn from side to side for one full minute. Rolling is not necessary if insulin is completely clear.



3

If opening a new bottle, remove the plastic cap (it will not be replaced). Wipe the top of the bottle with an alcohol swab.



4

Remove the caps from both the top and bottom of the insulin syringe. Do not touch the needle.



5

Pull the plunger down to the correct unit mark for the insulin dose ordered for you.



6

Insert the needle into the top of the bottle. Push the plunger down to inject the air into the bottle.



7

Turn the bottle upside down with the needle still in it.



8

Pull the plunger down to the selected dose by aligning the thin black line of the plunger (closest to the needle) to the desired number of units.



9

Pull the needle out of the bottle. Clean the skin with alcohol swab where you will be injecting the insulin.



10

Hold the syringe like a pencil and insert the needle straight into the skin at a 90° angle. Push the plunger until all the insulin is injected. Hold for 5-10 seconds and then remove needle. Throw the syringe away in a sharps container.



Six important **storage tips** for all insulin

1

Write the date on the insulin vial or pen on the day you open it. This will help you remember when to stop using it. Most insulins are discarded after 30 days from opening and using the vial or pen. Follow the manufacturers instructions for when to discard insulin.

2

Keep the pen you are using at room temperature. Always keep unopened extra insulin vials or pens in the refrigerator until you are ready to use them.

3

Do not keep insulin in hot places. Do not leave insulin in a hot closed car. Excessive heat will destroy the insulin and it will not work.

4

Do not keep insulin in freezing places. Never store in a freezer. If insulin is frozen, do not use.

5

Do not leave insulin in sunlight. Light can make insulin break down and then it will not work well to lower your blood sugar.

6

Never use insulin if expired. The expiration date will be stamped on the vial or pen.

if on long acting insulin (basal insulin)

- When you go home, your child will likely be more active than in the hospital.
- This may decrease the amount of long acting insulin needed.
- In addition, people recently diagnosed with diabetes may experience what's called the "honeymoon period."
 - This is a time when the pancreas (gland that makes insulin) is still making small amounts of insulin.
- To prevent overnight low blood sugar, check blood sugar at 2 a.m. for at least three days after discharge.
 - This is in addition to the checks before meals and at bedtime.
- If any blood sugar number at 2 a.m. or before breakfast is <80 mg/dl, please call your diabetes doctor to make adjustments in the long acting insulin dose. For young children call if below 100 mg/dl.
- If blood sugar numbers are consistently > 80-100 and Lantus dose has not been increased, it is OK to test overnight sugars once a week.

hyperglycemia

(high blood sugar)

REASONS INCLUDE:

- Too little insulin
- Illness
- Stress
- Spoiled insulin
- Other medications (i.e., steroids)

WHAT YOU SHOULD DO:

- Check your blood sugar.
- Drink plenty of sugar-free, caffeine-free liquids such as water. Don't drink fruit juice or Gatorade.
- Give insulin corrections via your insulin scale.
- Call your health care provider if you are not able to eat.
- Check urine for ketones as directed.
 - Please see following page regarding ketones.
- Call your health care provider if your blood sugar and ketones do not return to your target range.
- Please refer to your Diabetes Action Plan. We will discuss this in clinic.

SYMPTOMS:



Extreme thirst



Frequent urination



Dry skin



Hunger



Blurred vision



Drowsiness



Slower healing

diabetic ketoacidosis (DKA)

WHAT LEADS TO DKA?

- DKA occurs when ketones build up in the body because there is not enough insulin.
- **Ketones are an acid that forms when the body tries to use fat for the energy it needs instead of sugar.**

HOW DOES IT START?

- The body will spill ketones into the urine (ketonuria) when there isn't enough insulin.
- If the body still does not get the insulin it needs, then the blood acid level goes too high.

WHAT CAUSES DKA?

- Forgetting to give one or more insulin shots.
- Giving spoiled or expired insulin.
- Illness: more insulin may be needed.
- Not enough insulin, incorrect amount.
- Traumatic stress on the body.

HOW CAN DKA BE PREVENTED?

- Check the urine or blood for ketones.
- Drink extra water or sugar-free liquids to "flush out" ketones.
- Do not exercise if ketones are present, because exercise can increase ketones.
- Call the Diabetes Care Provider at (805) 879-4241, if urine ketones are moderate to large (dark pink or purple).

ketone fact sheet

WHEN SHOULD KETONES BE CHECKED?

- Anytime your blood glucose is over 300mg/dl (or 250mg/dl if on a pump).
- If ketones are positive, repeat every time you urinate, or every 2-3 hours, until ketones are negative on the strip.
- If you are very thirsty or need to urinate often.
- If you have diarrhea, stomach pain or are vomiting.
- If you are sick, test twice a day, even if your glucose is < 300mg/dl.

HOW DO YOU CHECK FOR URINE KETONES?

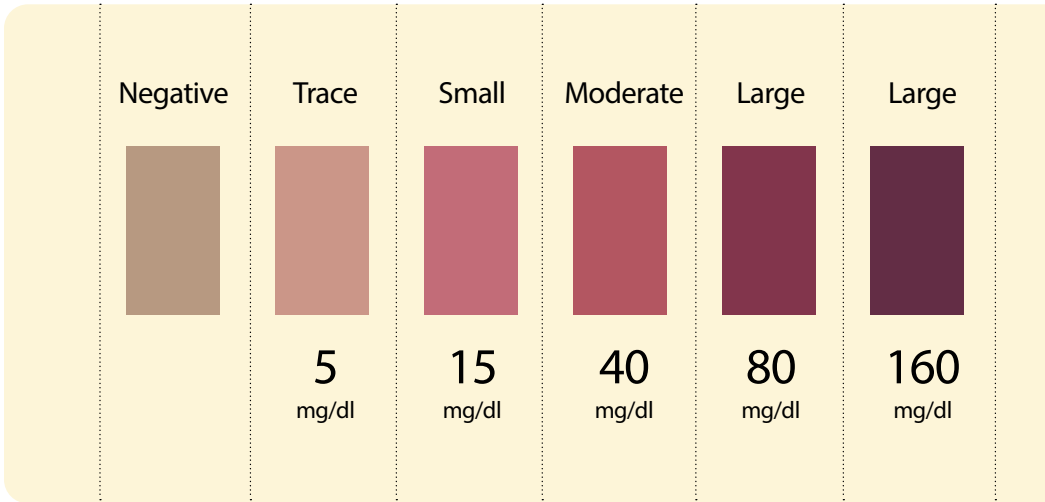
- Obtain a urine sample (when using diapers, put a cotton ball in the diaper to absorb urine for a test).
- Dip ketone strip into urine and shake off extra urine.
- Begin timing strip according to the directions on the bottle (usually 15 seconds).
- Compare strip against color chart.
- Record your results in your logbook so you can show them to your doctor.
- Check the expiration date on the ketone strip bottle. If the strips were opened more than six months earlier, or if they have been exposed to light or air, they may have lost their accuracy.

WHAT IF KETONES ARE PRESENT?

- Contact your doctor if you test positive for moderate or large ketones (dark pink or purple) and/or your blood sugar and ketones do not return to target range.
- You will need extra insulin to lower your blood sugar.
- Drink as many sugar-free liquids as possible.
- Test ketones every time you urinate until ketones clear.
- Take it easy and rest when you have ketones. Activity may make your ketones worse.

ketone

Read at exactly **15 seconds**



<0.6

Under 0.6 mmol/L - Normal

Consider rechecking blood ketone levels in 1-2 hours if blood glucose remains elevated, above 250 mg/dl (1.39 mmol/L).

**0.6
-1.5**

0.6 - 1.5 mmol/L - Indicates a need for extra insulin

It is important to call or follow the rules provided by your diabetes health care team and continue to check your blood glucose and blood ketone levels in 1-2 hours.

>1.5

Over 1.5 mmol/L - Indicates risk of diabetic ketacidosis

Call your health care team **immediately**.

hypoglycemia

(low blood sugar) $<70\text{mg/dl}$

REASONS:

- Too little food
- Too much insulin
- Illness
- Increased activity

WHAT YOU SHOULD DO:

- First, check your blood sugar if you have any symptoms, noted on the right.
- **If the blood sugar is $<70\text{ mg/dl}$, follow the 15:15 Rule:**
 1. If the child is conscious and able to swallow, give **15g fast acting carbs, such as:**
 - a. Fruit juice or regular soda - 4 oz.
 - b. Smarties - three packages
 - c. Glucose tablets - three or four tabs
 - d. Or any other fast-acting sugar that is 15 grams
 2. Retest blood sugar after 15 minutes.
 3. Repeat treatment if blood sugar is still $<70\text{mg/dl}$. Steps 1 and 2 may be repeated until blood sugar is at least 70mg/dl or above.
 4. If the child begins to lose consciousness, is unable to swallow, or is having a seizure; administer a Glucagon Emergency Kit.
 5. **ALWAYS** have a Glucagon Emergency Kit at home, if it is not available, call 911.

SYMPTOMS:



Anxiety



Dizziness



Fast heartbeat



Headache



Hunger



Impaired vision



Irritability



Shaking



Sweating



Weakness/fatigue

glucagon emergency kit

- Glucagon is a hormone that is also made in the pancreas. Glucagon and insulin have opposite actions.
- **Glucagon raises** blood glucose. **Insulin lowers** blood sugar.
- *Severe hypoglycemia*, or low blood sugar, may cause confusion, loss of consciousness (fainting), and sometimes seizures.
- Food or drink should **not** be put in the mouth of an unconscious person because it may cause choking.
- Glucagon is only used to treat severe low blood sugar when it is unsafe to take fast-acting sugar by mouth.

HOW TO USE GLUCAGON

1. Remove cap from glucagon bottle.
2. Remove rubber cover from the needle.
3. Inject all liquid from the syringe into the glucagon bottle.
4. Mix until dissolved and then pull back the entire 1 mg dose into the syringe.
5. Inject the syringe into the muscle; the preferred site is the patient's thigh (do not pinch the skin).
6. After giving the glucagon injection, turn the person on his or her side so as not to choke upon waking up. *Vomiting is a common side effect of Glucagon.*
7. Glucagon usually takes 5 to 15 minutes to work. If your child does not become more alert within 5 to 15 minutes, call 911.
8. After your child wakes up, give 4 oz. of a sugar drink (juice or regular soda) and a small snack. Headaches, nausea and fatigue are common after severe low blood sugar. It may take a few hours for your child to feel completely well.

If you have to use glucagon, call the Endocrinology Clinic at (805) 879-4241, or on-call physician during after hours, before giving the next insulin injection.

discharge checklist

ITEMS FOR HOME

1. A written guide for dosing insulin at home.
2. Your child's prescriptions and diabetes supplies
 - a. Medication: rapid-acting and long-acting insulins, an emergency glucagon kit
 - b. Devices: blood sugar meter and lancing device
(For young children blood ketone meter and strips)
 - c. Supplies: lancets, BG test strips, 6 mm syringes, sharps container, ketone test strips, alcohol swabs
 - d. Your child will need extra medication, devices and supplies for school. Please see below.

THINGS TO DO TODAY

1. Plan today's meals.
2. Take prescriptions to your local pharmacy (unless already delivered by another pharmacy).
3. Check blood sugars and give insulin as instructed.
4. Order a Medic-Alert bracelet for your child that says "Type 1 Diabetes" that is worn at all times.

WHAT TO DO FOR SCHOOL

1. Contact your school nurse and set up a meeting.
2. Take your school orders for insulin, daily testing, glucagon, and treatment for high and low blood sugars. (You may not get these school orders until you are out of the hospital due to the doctor needing to change your insulin doses frequently the first few days.)
3. Provide the school with a vial of insulin, syringes, blood sugar testing supplies, ketone strips and an emergency glucagon kit.

4. Provide the school with a supply of juice and glucose tablets for lows. Send snacks to school if your child needs to prevent lows at PE or during honeymoon period.
5. Write the carb content of foods packed for lunch or ask the school for the carb content of school meals.

AFTER DISCHARGE

- **Please call the clinic for moderate or large ketones.**
- **Please call the clinic if you have a low blood sugar.**
- Your child will have a clinic appointment with the diabetes team after discharge from the hospital.
- Please call the clinic two days after discharge to report all blood sugars.
- Your child must be cleared by a physician and the DMV before returning to driving. Driving with a low blood sugar can result in problems just as severe as driving drunk.

CLINIC PHONE NUMBER:

(805) 879-4241

If you need to call after hours for an urgent diabetes concern, please call the clinic number and ask the answering service to connect you to the endocrinologist on call.

For emergencies please call 911.

diabetes glucose diary

NAME:					DOB:		
DATE:	MORNING	BREAKFAST	LUNCH	DINNER	BEDTIME	MIDNIGHT	3 A.M.

INSULIN REGIMEN:

LANTUS	UNITS:	TIME:
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INSULIN TO CARB RATIO:

HIGH GLUCOSE CORRECTION DOSE:

diabetes glucose diary

NAME:						DOB:	
DATE:	MORNING	BREAKFAST	LUNCH	DINNER	BEDTIME	MIDNIGHT	3 A.M.

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diabetes glucose diary

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diabetes glucose diary

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LANTUS	UNITS:	TIME:
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INSULIN TO CARB RATIO:

HIGH GLUCOSE CORRECTION DOSE:

400 W. Pueblo Street
Santa Barbara, CA 93102
cottagechildrens.org

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