

Preparing for Carotid Artery Angioplasty and Stenting

**Michigan Medicine
Frankel Cardiovascular Center**



Michigan Medicine Phone Numbers

Billing	855-855-0863
	734-615-0863
Call Center	888-287-1082
Vascular Surgery (use Call Center)	888-287-1082
Cardiovascular Operating Room Desk	734-232-4553
Office of Clinical Safety (comments)	877-285-7788
Emergency Department	734-936-6666
Guest Assistance Program (GAP) (accommodations)	800-888-9825
Hospital Operator	734-936-4000
Lost & Found	734-936-7890
Mardigan Wellness Resource Center	734-232-4120
Parking & Transportation	734-764-7474
Registration & Insurance4 Verification	866-452-9896
Med-Inn (hotel)	800-544-8684
	734-936-0100
Tobacco Consultation Services	734-938-6222
Units (Patient Care):	
CVC-4 ICU	734-936-6514
CVC-5 Cardiac Surgery	734-232-4772

Other:

Michigan Quit Line (Smoking)800-784-8669

Address (mail):

Frankel CVC (room number/unit if known) or UH (room number/unit if known)

Person's Name

University of Michigan Health System

1500 E. Medical Center Drive

Ann Arbor, MI 48109

Building Location (visiting):

Samuel and Jean Frankel Cardiovascular Center

East Ann Street & Observatory Street

Ann Arbor, MI 48109

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What are my pre-procedure medication instructions?

A member of your health care team will review your medications at your history and physical visit. They will tell you which medications to stop before your procedure, and which to take on the morning of your procedure with sips of water.

Insulin: Your health care team will let you know if there are any changes to your dose(s) the night before and/or the day of surgery.

Do not smoke for 2 weeks before surgery.

What about my blood thinners?

- Your care team will talk to you about your blood thinners. Tell them if you are on a blood thinner such as: warfarin (Coumadin®), rivaroxaban (Xarelto®), dabigatran (Pradaxa®), apixaban (Eliquis®), or edoxaban (Lixiana®). You will have to **stop taking** your blood thinner. You may have to take a different blood thinner instead.
- Continue to take aspirin or clopidogrel (Plavix®) unless your surgeon tells you not to.

What about over the counter medications and supplements?

Below are common medications and supplements you need to discontinue prior to your procedure. Here are a few general rules that you should follow:

- **(14) days before your procedure:** stop taking Coenzyme Q10 (CoQ10)
- **(10) days before your procedure:** stop taking Non-Steroidal Anti-Inflammatory Drugs (NSAIDs):

Advil® (ibuprofen)	Motrin® (ibuprofen)
Aleve® (ibuprofen)	Naprosyn® (naproxen)
Midol® (ibuprofen)	Nuprin® (ibuprofen)

- **(10) days before your procedure:** stop taking vitamin E, Herbal Supplements, or Fish Oil.

Note: the medications listed are selective and do not include all medications that affect bleeding. You should always follow your health care team's directions about taking medications.

How can I prepare for my hospital stay?

- Review the preoperative folder and bring it with you. If indicated, bring the light blue Blood Bank form.
- Assign a family member or friend as your driver, you will not be able to drive yourself home. Taking a cab or bus alone is unacceptable unless someone you know is with you.
- **Quit smoking and vaping!** The sooner you quit before surgery, the better. Patients who smoke or vape up until the day of surgery are at higher risk of developing complications during and after surgery. If you continue to smoke/vape you will be more likely to have:
 - A longer stay in the hospital
 - A greater chance of needing intensive care
 - Increased risk of poor wound healing
 - Increased risk of death

If you want assistance to quit prior to surgery, ask for a referral to the MHealthy Tobacco Consultation Service or call them yourself at (734) 998-6222.

Other resources:

- The Michigan Tobacco Quit line: 1-800-QUIT-NOW (free resource)
- The Truth Initiative: www.becomeanex.org
- US Department of Health and Human Services: www.smokefree.gov

What do I bring to the hospital?

- Bring any documents related to Advance Directives.
- Leave all jewelry at home. Including wedding bands, hair clips, body piercings, earrings and watches.

Plan to bring any special equipment you use at home:

- Glasses, dentures, and hearing aids with storage cases. Make sure you label these items with your name.
- CPAP and/or BiPAP machine if you have sleep apnea.
- Walker or cane, labeled with your name.

Pack a suitcase with these items for your family/friends to bring to you after your procedure. You will not need the suitcase until you are transferred to the moderate care unit.

- Loose, comfortable clothing. Button down shirts are preferred.
- Robe.
- Comfortable walking shoes.
- Toiletry articles: toothbrush, comb, etc.
- A list of medications that you are currently taking including vitamins and herbal supplements. Do not bring the actual medications with you.

How will I prepare for my procedure?

Instructions for **the day before** your procedure:

- **Do not** drink alcohol 24 hours before your procedure.
- On the last business day (Monday-Friday) before your procedure, you will need to confirm the day and time of your procedure. Make sure you follow these steps:
 - If your surgery is in the:
 - **CVC Operating Room** on level 4
 - Call the surgery phone line at **(866) 983-9090** between 7:30am and 11:30am.
 - If your procedure is on Monday, call the Friday before. If your procedure is the day after a holiday, call on the last business day (M-F) before the holiday.

- On the answering machine leave your name and phone number. Be sure to spell your name clearly and slowly.
- A preoperative nurse will call you back between in the afternoon before 5:00pm to give you the following instructions:
 - The time your procedure starts and what time you should arrive the day of your procedure.
 - When to stop eating food and drinking liquids.
 - Medications you should take on the day of your procedure.
- **CVC Hybrid Operating Room** on Level 2A
 - A preoperative nurse from the cardiac procedure unit will call you after 2:00pm to give you the following instructions:
 - The time your procedure starts and what time you should arrive the day of your procedure.
 - When to stop eating food and drinking liquids.
 - Medications you should take on the day of your procedure.
 - If your procedure is on Monday, call the Friday before. If your procedure is the day after a holiday, you will get a call on the last business day (M-F) before the holiday.

Who do I contact if I'm not feeling well the day before my procedure?

Report any symptoms of flu, cold, infection, chest pain, difficulty breathing or black/bloody stools to your doctor. It is important that you be in your best health possible for your procedure.

- To report any of these symptoms before 4:30pm call **(888) 287-1082**
Monday - Friday and ask to speak to the Vascular Surgery Nurse.
- To report symptoms after 4:30pm, please call **(866) 983-9090** and leave a message

What activities should I avoid after midnight the night before my procedure?

- **Do not eat** gum, hard candy, or food of any kind
- You may have sips of water with your morning medications up to (2) hours before your arrival time.

How do I shower and get ready for my procedure?

On the night before and morning of your procedure, you need to shower using Chlorhexidine (CHG) 4% antiseptic soap which is a surgical soap that reduces the amount of germs on your skin.

1. Take a shower **the night before** your procedure.
2. Wash your face using regular soap.
3. Wash your hair with regular shampoo. Make sure to rinse your hair completely after shampooing.
4. Wash your body from the neck down using the chlorhexidine body wash for at least 5 minutes with a freshly-laundered wash cloth:
 - a) First, wash **your surgical site** area and all surrounding skin with the CHG soap.
 - b) Then wash your underarms, chest, under your breasts, stomach/belly button, hips, groin and buttocks.
 - c) Rinse thoroughly.
 - d) **Do not** use the body wash on your face, eyes, ears, mouth or hair.
 - e) **Do not** use in your genital area (“private parts”).
5. Rinse your body completely and pat your skin dry with a freshly laundered towel.
 - **Do not** apply make-up, deodorant, lotions, sprays, gels, creams, ointments or powders after showering with the CHG soap.
 - After showering, use freshly-laundered bed linens.
6. Put on freshly laundered underwear, socks and clothing.
7. **On the morning** of your procedure, use a new freshly-laundered washcloth and towel and repeat steps 1-6.

- **Remove** nail polish or artificial nail products from your hands and feet.
- **Do** brush your teeth the morning of your procedure. This reduces your chance of pneumonia after surgery.
- **Do not shave** the hair on your neck. Shaving your skin with a razor can actually increase your risk of infection. We will prepare your skin by removing hair with special clippers the morning of your procedure.
- **Do not** wear contact lenses to the operating room.

What happens when I arrive at the hospital?

Please park in Cardiovascular Center Visitor Parking Structure P5.

1. Enter the Cardiovascular Center on Level 3 from the parking structure
2. If your procedure is in the:
 - **CVC Operating Room** on Level 4
 - Take the elevator to Level 4.
 - “Surgery Check-In” is on the right hand side after you exit the elevator.
 - **CVC Hybrid Operating Room** on Level 2A
 - Take the elevator to Level 2A.
 - “Surgery Check-In” is on the left hand side after you exit the elevator.

<p>Address to use for GPS directions to the Frankel Cardiovascular Center: 1425 E. Ann St. Ann Arbor, MI. 48109</p>

Valet service is available for patients, families, and other visitors for a \$5.00 fee at the circle drive main entrance to the Cardiovascular Center. Valet Service is available:

- Monday through Friday 5:30 a.m. to 7:00 p.m.
- Saturday and Sunday 8:00 a.m. to 6:00 p.m.

Frankel Cardiovascular Center
Preparing for Carotid Artery Angioplasty and Stenting

What can I expect during my procedure?

Carotid angioplasty is considered a non-surgical procedure because it's less invasive than surgery. Your body isn't cut open except for a very small puncture site in your groin, arm or wrist. General anesthesia isn't needed, so you're awake during the procedure.

Before the procedure

- You are taken to a procedure room and asked to lie on a bed. You will rest your head in a cup-shaped area to help you remain comfortable and still while pictures of your carotid artery are taken.
- Small electrode patches are placed on your chest to monitor your heart rate and rhythm during the procedure.
- You will have an intravenous catheter placed in your veins for fluids and medications.
- Your groin or arm is shaved and cleaned with an antiseptic solution, and a sterile drape is placed over your body.
- You will receive sedation medication to help you relax.
- A local anesthetic is injected into your groin to numb the area.
- Once you're sedated, your doctor makes a puncture in an artery (groin or neck).

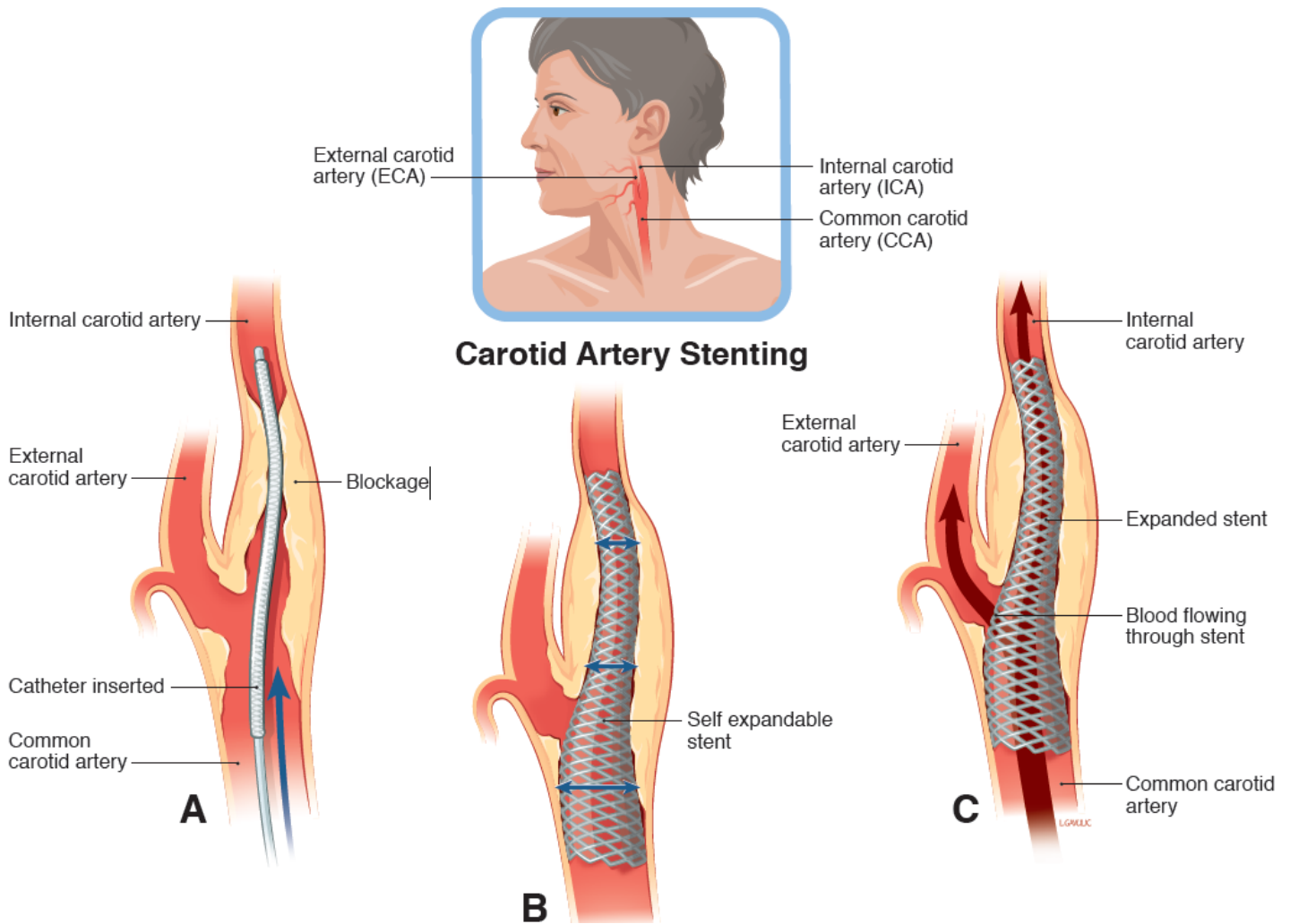
During the procedure

The following describes the angioplasty and stenting procedure:

1. A small hollow tube (sheath) is placed into your artery.
2. A tube (catheter) with a balloon tip is threaded through the hollow tube to the narrowing in your carotid artery using X-ray guidance.
3. Contrast material (a dye that shows up on X-rays) is injected into your carotid artery through the catheter to allow your doctor to see a detailed view of your narrowed artery on the X-ray screen. You may feel warmth in your chest or head from the contrast material.

4. A filter is placed in your artery beyond the narrowing to catch any pieces of plaque that may break off during the procedure.
5. The balloon tip is threaded into the narrowed area and inflated to push the plaque to the side and open the narrowed area.
6. A small metal mesh tube (stent) may be placed in your newly opened vessel. The stent expands to provide support to the artery wall and helps prevent the artery from narrowing again.
7. The filter, sheath, catheter and balloon are then removed.

Your doctor may ask you to state your name or squeeze your hand during the procedure to make sure you are doing ok.



What will my hospital stay be like?

After your procedure you will be admitted to the CVC-2A observation unit or CVC-5 moderate care unit. You may be able to go home the next day. Your doctor will tell you more about what to expect. Our team will continue to help you recover from your procedure. When you arrive to the unit, your nurse and patient care technician will meet you. They will orient you and your family to the unit.

Our Visitation Policy

- In alignment with Michigan Medicine, the Cardiovascular Center welcomes the presence of loved ones.
- Family members are welcome at your bedside 24 hours a day. We want you to feel supported, not only by the care we provide but by your loved one's presence as well.
- "Family" (for purpose of visitation) is defined by you and is usually 1 or more individuals who play a significant role in your life. Family members may be related in any way- biologically, legally or emotionally. Your family member may include a person(s) who is not legally related to you.
- At times, we may ask your family members to step outside of the room if procedures or other necessary interventions need to be done. Your family will be welcomed back as soon as possible.

When you first arrive

- You may feel sleepy from the sedative given to you, but this should wear off in time.
- You will have to stay in bed for several hours, keeping your leg or arm straight to prevent bleeding or bruising at your procedure site.
- You will be asked to drink lots of fluids to flush the contrast dye out of your system.

What type of monitoring will I need while I'm here?

When you arrive on the unit a portable heart monitor called a telemetry unit, will be attached to your chest. The unit will send your heart rate and rhythm to monitors located at your bedside and at the nursing station. This portable monitor allows you to walk in the halls freely. Other care you may receive includes:

- The nurses and techs will regularly check your blood pressure, heart rate and temperature.
- After the procedure, you may have an ultrasound of your carotid artery.
- The nursing staff will also check your speech and movements periodically.
- Your procedure site will be checked frequently.
- You will have your blood drawn for lab tests
- We will measure how much you drink and urinate. We will provide a container for you to urinate into for measurement. We will also ask that you keep track of the amount of fluid that you drink and report it to your nurse or tech.
- You will be weighed daily
- A staff member (either a nurse or tech) will enter your room to assess your needs hourly.

Pain and discomfort after your procedure

What kind of pain or discomfort will I feel after my procedure?

You may feel slight pain at the puncture site (groin or neck). You should not feel significant discomfort anywhere else and the pain should be controllable with Ibuprofen and Acetaminophen.

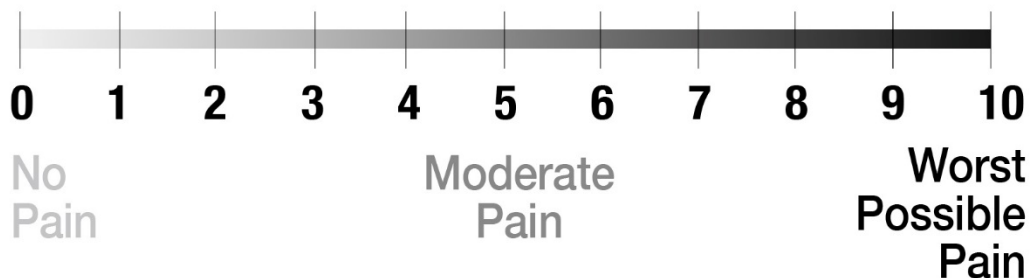
What can I do to help keep my pain under control?

Your doctor will order effective medication for you to take. Narcotics are not typically prescribed for this procedure and so you will most likely receive Ibuprofen and Acetaminophen. Your nurse will ask you about your pain

regularly throughout your recovery. You shouldn't hesitate to ask for pain medication if needed.

Throughout your hospital stay, the nurses will monitor your need for pain medication. You can use the numeric pain rating scale below to measure your pain. This is a helpful tool you can use to describe how much pain you are feeling and to measure how well treatments are relieving your pain. You will be asked to rate your pain using a 0-to-10 pain scale. 0 means "no pain." 10 means the "worst pain possible."

Numeric Pain Rating Scale



Why is it so important to control pain after my procedure?

Having good pain control not only helps you feel more comfortable, but also helps you recover faster and may reduce your risk of developing certain complications, such as pneumonia and blood clots. If your pain is well managed, tasks such as sitting, walking, coughing, deep breathing and eating will be easier.

What exercises will I do after the procedure?

Exercise is an important part of the recovery process after your procedure.

Below are activities you will be expected to perform during your hospital stay:

- **Deep breathing and Coughing**

Use your breathing machine (Incentive Spirometer) 10 times every hour while you are awake. For example, if you like watching TV, you should be using your Incentive Spirometer 2-3 times during each commercial break.

Tips when using the incentive spirometer:

- Do not get discouraged if you do not reach the number marked for you. You will improve with practice as your body heals.
- If you start to feel dizzy or light-headed, remove the mouthpiece from your mouth and take some normal breaths. Once you feel better, continue using the incentive spirometer.



How to Use an Incentive Spirometer

[By BruceBlaus - Own work, CC BY-SA 4.0](#)

- **Walking**

Walking after your procedure is one of the most important things you can do. Beginning the day of your procedure, you will have exercise goals once you are off of bedrest:

- Walk the halls
- Up to the chair for meals

- **Repositioning**

To prevent pressure injuries during your hospital stay, you need to change your body position. The following recommendations will help you reposition yourself:

While in bed:

- Turn your body at least every 2 hours from side to side.
- Keep the head of your bed at a 30-degree angle or lower to prevent too much pressure on your bones.
- Place a pillow between your ankles and knees when lying on your side.
- Place a pillow under your lower legs to elevate the heels when lying on your back.

When sitting:

- change your position every 15 minutes by tilting your body forward or to the side so that your bottom lifts off the seat.
- Stand up or do “pushups” by using arms to raise off the seat every hour.

What will my diet be after my procedure?

Your food will be low in fat and cholesterol and will not have any added salt or sugar. It may taste different than what you are used to eating at home. It is very important for you to eat to improve the healing process. Healthy food choices play a key role in the healing process.

Guidelines:

Eat a balanced diet of:

- Carbohydrate-rich foods high in fiber
- A variety of fruits and vegetables
- Low-fat dairy products
- Lean meats

- Protein-rich foods very important for wound healing. Good source of protein includes: fish, eggs, dairy, beans and nuts.

Room service is available at any time of the day. Your nurse will bring you a menu so you can choose what you would like to eat. Your nurse will check to see if you ordered food and will assist you if needed.

If you are diabetic or insulin dependent, your nurse will ask you to call them before you eat so they can check your blood sugar. It is fine for your family to bring food from home, but it should be low in salt and low to moderate in fat.

Many people experience constipation after their procedure due to inactivity and pain medication. Eating a diet rich in fiber, drinking enough fluids, walking the halls and taking a stool softener will help your bowels move. Sometimes a suppository or laxative is needed to help aid this process along.

Our registered dietitians are food and nutrition experts who are available to discuss heart healthy choices and salt alternatives or reduction. They provide sound, easy-to-follow nutrition advice. If you are interested in speaking to a dietician, ask your nurse to arrange a visit.

How will I care for myself while in the hospital?

- Wash your hands frequently or use hand sanitizer or sanitizer wipes that we provide to you. Hand hygiene is very important to decrease your risk of infection.
- Bathe daily with the assistance of a staff or family member.

Discharge to Home

You will be discharged from the hospital within 24 hours after your procedure. Do not plan on driving yourself home or going home alone in a cab or bus.

When you're ready to go home, you'll need to have a family member or friend drive you.

What can I expect on the day of discharge?

- Ask a family member or friend to arrive at 9:30am to review final discharge instructions with you and your nurse.
- Your case manager nurse will be in contact with you to explain your final discharge plans.
- Your nurse will review all discharge instructions with you. During this time, ask any questions that you may have about your care after discharge.
- Be sure to understand:
 - Your medications and prescriptions
 - Incision care
 - Activity and restrictions
 - Diet
 - Reasons to call your doctor
 - Follow up appointment information
- At home you will need to monitor your temperature until your next appointment. Please make sure that you have a thermometer before you are discharged.

When do I need to seek emergency care?

Call 9-1-1 immediately if:

If you have any of the following **symptoms of a stroke**:

- Sudden confusion or trouble speaking or understanding others
- Sudden trouble seeing in one or both eyes
- Sudden numbness or weakness of the face, arm, or leg, usually on one side of your body
- Sudden trouble walking, dizziness, or loss of balance or coordination
- Sudden or severe headache with no known cause

If you have any of the symptoms listed below:

- Sudden onset of chest pain
- Shortness of breath not relieved by rest
- Severe bleeding or swelling at your procedure site
- If your legs feel numb, tingly, cold or look blue
- You believe you are experiencing a true emergency

When do I need to call my doctor?

- Under the tongue temperature above 101.5° F
- Bleeding, redness, swelling, increased pain or foul smelling drainage near your procedure site
- Bruising at your procedure site that increases in size quickly
- Procedure site that opens up after you leave the hospital
- Increased swelling in your legs or ankles
- Weight gain of more than 5 pounds in 3 days
- Increased shortness of breath/difficulty breathing
- Trouble urinating
- Nausea, vomiting or diarrhea
- Stomach pain or bloating
- Chills or excessive sweating
- A vague feeling that something is wrong
- Black or blood stools

What is the number to call?

- Call (888) 287-1082 Monday through Friday from 8:00am to 4:30pm:
 - Ask to speak to the Vascular Surgery Nurse.
- Call (734) 936-6267 after 4:30pm or on weekends or holidays:
 - Ask the hospital operator to page the Vascular Surgery Medical Resident on call. You will receive a call back from the Resident.

What type of follow up care will I receive?

- You will have a post-operative visit in the Vascular Surgery Clinic in after your procedure. You will receive information about your appointment at the time of discharge. If you did not receive an appointment for your return visit before you left the hospital, please call **(888) 287-1082** to schedule this visit. You may need follow-up tests such as a carotid duplex ultrasound before or during your clinic visit.

What steps should I take to monitor my health at home?

You will need to perform and record the following self-checks daily:

- Check your procedure site daily for signs of infection including: increased redness, tenderness, swelling, warmth or drainage.
- Take your temperature each morning before eating, drinking and anytime you think you may have a fever for the first week after your procedure.
- Weigh yourself at the same time, on the same scale, in the same clothes, and in the same way each day.

How do I care for my procedure site?

You will have a procedure site in your groin or neck. This site may remain tender, swollen and bruised for up to a week. There may be a small area of discoloration or a small lump in the area of the puncture.

Follow these guidelines to care for your procedure site while bathing:

- Wash your procedure site(s) with your usual bath soap and water every day. Pat dry and leave open to air. Use a freshly laundered wash cloth and towel each time you shower.
- **Do not** put any creams, lotions, powders or ointments on your surgical incision(s) until they heal.
- **Do not** soak in a bathtub, hot tub or get into a swimming pool for the next 4 weeks.

What are my activity instructions?

After 48 hours you can return to your usual activities.

Restrictions

- Do not participate in strenuous activities (weight lifting, running etc.) for 7 days after your procedure.
- Avoid heavy lifting (more than 5 pounds) and pushing or pulling heavy objects for 7 days after your procedure.
- **Driving:**
 - You can resume driving 3 days after your procedure if you have full range of motion in your neck and no discomfort.
 - **Do not** drive if you are taking narcotic (opioid) pain medication.
 - You can ride as a passenger in a car at any time, but, as always, you should wear your seatbelt.
- Do not return to work until you have seen your doctor at your follow up clinic visit.

Activities

- Walk every day (find an indoor setting during bad weather).
- You may climb stairs but take them at a slow pace.
- Limit the number of times you take the stairs until you feel well.
- Gradually increase your activities until you reach your normal activity level within one week after the procedure.

How will I manage my discomfort at home?

You will experience minimal pain after your procedure. Your goal at home is to control your discomfort so you can do the things you need to do to heal. It is important to know that discomfort is normal after this procedure. You may take acetaminophen (Tylenol[®]) or ibuprofen (Motrin[®]) for any discomfort at your procedure site.

Below are a few tips to help you relieve your discomfort:

- Remember to take acetaminophen (Tylenol[®]) or ibuprofen (Motrin[®]) before activity and at bedtime.
- Be sure to get enough rest. If you are having trouble sleeping, talk to your primary care doctor.
- Use pillows to support you when you sleep and when you do your coughing and deep breathing exercises.
- Try using alternative methods for pain: guided imagery, listening to soft music, changing your position in bed, or massage.

What are my medication instructions?

- When you are discharged from the hospital, you will receive a complete list of the medications that you should take at home.
- Your medication list will include the following information:
 - Medication name(s)
 - Dose of the medication
 - Number of times to take the medication each day
 - The last time you took each medication
 - The next time that you should take each medication
- Your doctor will give you any new prescriptions for your recovery before you leave the hospital. Contact your heart doctor or primary care provider if you need refills for your ongoing medications.
- Have your insurance cards with you to help speed up the filling of your prescriptions.
- Take your medicine exactly as your doctor prescribes.
- Do not take other medication without telling your doctor.
- Follow-up with your heart doctor and primary care provider within 2 weeks of discharge. They will need to make sure your medication list is complete and accurate. They may also need to adjust or change doses for the most effective treatment.

- Keep a current list of your medicines, dosages, and times to be taken in your wallet or purse.

What can I do to stay healthy?

Although carotid stenting opens your artery and keeps blood flowing, it does not stop plaque from building up again. To prevent your arteries from becoming narrow again, consider the following lifestyle changes:

- Eat more foods low in saturated fat, cholesterol, and calories
- Exercise regularly, especially aerobic exercises such as walking
- Maintain your ideal body weight
- Quit smoking
- Take your medications to control cholesterol and to thin your blood if your provider prescribes it.

Disclaimer: This document contains information and/or instructional materials developed by Michigan Medicine for the typical patient with your condition. It may include links to online content that was not created by Michigan Medicine and for which Michigan Medicine does not assume responsibility. It does not replace medical advice from your health care provider because your experience may differ from that of the typical patient. Talk to your health care provider if you have any questions about this document, your condition or your treatment plan.

Author: Bethany Lee-Lehner, RN, MSN
Reviewers: Vascular Surgery Clinical Care Coordinators
Chandu Vemuri, MD
Control#: 1144

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