



Patient Information: Contrast-Enhanced Mammography (CEM)

What is Contrast-Enhanced Mammography?

Contrast-Enhanced Mammography (CEM) is an advanced breast imaging technique that combines traditional mammography with intravenous contrast material. This technology provides both structural information about breast tissue (like a regular mammogram) and functional information about blood flow to detect areas where cancer might be growing.

During the procedure, you receive an injection of iodinated contrast material through an IV line. The contrast highlights areas of increased blood flow, which can help identify cancerous tissues that may not be visible on standard mammograms alone.

How CEM Works

The Science Behind CEM:

- **Dual-energy imaging** captures images at two different energy levels
- **Contrast material** enhances blood vessels and areas with increased blood supply
- **Cancerous tissues** often have increased blood flow and will "light up" with contrast
- **Computer processing** combines the images to create detailed pictures showing both breast structure and blood flow patterns

Comparison to Standard Mammography:

- Uses the **same compression** and positioning as regular mammograms
- **Added contrast injection** provides additional information
- **Slightly longer procedure time** (about 10-15 minutes total)
- **Higher sensitivity** for detecting cancer, especially in dense breast tissue

Why Might Your Doctor Recommend CEM?

Primary Indications:

- **Dense breast tissue** where standard mammograms may miss cancers
- **High-risk patients** who need enhanced screening but cannot have MRI
- **Problem-solving** when mammogram or ultrasound findings are unclear
- **Newly diagnosed breast cancer** to evaluate extent of disease
- **Monitoring treatment response** in patients receiving chemotherapy

Specific Clinical Situations:

- **Family history** of breast or ovarian cancer
- **Previous breast cancer** with need for enhanced surveillance
- **Suspicious findings** on mammogram that need further evaluation
- **Breast symptoms** in patients with dense tissue
- **Genetic mutations** (BRCA1, BRCA2) requiring intensive screening



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Benefits of CEM

Diagnostic Advantages:

- **Higher cancer detection rate** compared to mammography alone
- **Better visualization** in dense breast tissue
- **Improved characterization** of suspicious lesions
- **More comprehensive evaluation** of disease extent
- **Faster procedure** compared to breast MRI
- **Lower cost** than breast MRI

Patient Benefits:

- **More accurate diagnosis** leading to appropriate treatment
- **Reduced need** for additional imaging tests
- **Earlier cancer detection** in some cases
- **Better treatment planning** when cancer is found
- **Peace of mind** with more thorough screening

What to Expect During Your CEM Exam

Before Your Appointment:

- **Schedule timing** - Best performed 1-2 weeks after menstrual period for premenopausal women
- **Avoid caffeine** for 4 hours before the exam if possible
- **Inform staff** of any allergies, especially to iodine or contrast materials
- **List medications** you're taking, especially diabetes medications
- **Bring previous mammograms** if done at other facilities

Day of Your Exam:

- **Arrive 15 minutes early** for registration and preparation
- **Wear comfortable clothing** that separates at the waist
- **Remove jewellery** and deodorant from chest and underarm areas
- **IV line placement** in your arm for contrast injection
- **Pre-contrast images** may be taken first

During the Procedure:

1. **Positioning** - Same as regular mammogram with breast compression
2. **Contrast injection** - IV contrast given through the IV line
3. **Image acquisition** - Multiple images taken at different energy levels
4. **Timing is important** - Images must be taken within specific time windows after contrast injection
5. **Both breasts imaged** - Usually takes about 10-15 minutes total



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After the Procedure:

- **IV removal** and brief observation period
- **Drink plenty of fluids** to help eliminate contrast from your body
- **Normal activities** can be resumed immediately
- **Results discussion** - Radiologist will review images and provide report to your doctor

Potential Risks and Side Effects

Contrast-Related Risks:

- **Allergic reactions** - Rare but can range from mild to severe
- **Kidney function** - Important for patients with kidney disease
- **Nausea or metallic taste** - Temporary and mild
- **Injection site irritation** - Minimal discomfort at IV site

Radiation Exposure:

- **Slightly higher** than standard mammography due to dual-energy technique
- **Still considered safe** within established medical guidelines
- **Benefits typically outweigh** minimal radiation risk
- **Comparable to** other medical imaging procedures

Who Should Not Have CEM:

- **Severe contrast allergies** (may require pre-medication or alternative imaging)
- **Significant kidney disease** (contrast may worsen kidney function)
- **Pregnancy** (radiation and contrast concerns)
- **Breastfeeding** (may need to pump and discard milk for 24 hours)

Preparing for Your CEM Exam

Medical Information to Provide:

- **Previous allergic reactions** to contrast materials or medications
- **Kidney disease** or diabetes
- **Current medications**, especially metformin for diabetes
- **Previous breast biopsies** or surgeries
- **Family history** of breast or ovarian cancer

Physical Preparation:

- **Schedule appropriately** in menstrual cycle if premenopausal
- **Avoid deodorant, powder, or lotion** on chest and underarms
- **Wear two-piece outfit** for easier undressing
- **Remove jewellery** from neck and chest area
- **Stay hydrated** before and after the exam



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Understanding Your Results

What the Radiologist Looks For:

- **Areas of contrast enhancement** that might indicate cancer
- **Size and extent** of any suspicious areas
- **Comparison with previous** imaging studies
- **Overall breast tissue patterns** and any changes

Possible Results:

- **Normal study** - No significant areas of enhancement or suspicious findings
- **Benign findings** - Enhancement that appears non-cancerous
- **Suspicious areas** - Enhancement that may require biopsy or additional testing
- **Further evaluation needed** - Recommendation for additional imaging or procedures

Follow-Up Recommendations:

- **Routine screening** if results are normal
- **Additional imaging** if findings are indeterminate
- **Biopsy consultation** if suspicious areas are identified
- **Treatment planning** if cancer is diagnosed

CEM vs. Other Breast Imaging

CEM vs. Standard Mammography:

- **Higher sensitivity** for cancer detection with CEM
- **Better performance** in dense breast tissue
- **Slightly longer procedure** and higher cost
- **Requires IV contrast** with associated risks

CEM vs. Breast MRI:

- **Faster procedure** - CEM takes 10-15 minutes vs. 30-45 minutes for MRI
- **Lower cost** than MRI
- **No claustrophobia** issues like with MRI
- **Similar cancer detection** rates in many studies
- **Uses radiation** unlike MRI

CEM vs. Breast Ultrasound:

- **More comprehensive** evaluation than ultrasound
- **Better for screening** entire breast
- **Provides functional information** about blood flow
- **Requires contrast injection** unlike ultrasound



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Cost

Typical Costs:

- **Generally less expensive** than breast MRI
- **More expensive** than standard mammography
- **May include** professional fees for radiologist interpretation
- **Additional costs** for any follow-up procedures if needed

When to Contact Your Healthcare Provider

After Your CEM Exam:

- **Severe allergic reaction** symptoms (difficulty breathing, widespread rash)
- **Persistent nausea or vomiting** beyond a few hours
- **Unusual arm pain** or swelling at IV site
- **Any concerning symptoms** you're unsure about

Regarding Your Results:

- **Questions about findings** or recommendations
- **Delays in receiving results** beyond expected timeframe
- **Need for clarification** about next steps
- **Concerns about follow-up** recommendations

Questions to Ask Your Healthcare Team

Before Your CEM Exam:

- Why is CEM recommended over other imaging options?
- What are you looking for specifically in my case?
- How will the results change my care plan?
- What are my alternatives if I can't have contrast?
- When will I receive my results?

About the Results:

- What do my results mean for my breast health?
- Do I need any follow-up imaging or procedures?
- How do these results compare to my previous mammograms?
- When should I have my next screening exam?
- Are there any lifestyle changes I should consider?

Important Reminders

General Points:



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- **CEM is a safe procedure** when appropriate precautions are taken
- **Enhanced cancer detection** can lead to earlier treatment and better outcomes
- **Not a replacement** for all other breast imaging but a valuable addition
- **Results should be discussed** with your healthcare provider in context of your overall health

Follow-Up Care:

- **Continue routine screening** as recommended by your healthcare provider
- **Report any breast changes** between screening exams
- **Maintain healthy lifestyle** habits for overall breast health
- **Keep records** of all breast imaging for future reference

Emergency Situations:

- **Seek immediate care** for severe allergic reactions
- **Contact your doctor** for any unusual symptoms after the procedure
- **Don't delay** seeking care if you have concerns

Remember: CEM is an advanced imaging tool that can provide valuable information about your breast health. While it involves slightly more preparation and risk than standard mammography, it can offer important benefits for cancer detection, especially in women with dense breast tissue or other risk factors.