



# Contrast Agents in Clinical Practice

Risks, Benefits, and Best Practices

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# Disclosures

The planner(s) and speaker(s) have indicated that there are no relevant financial relationships with any ineligible companies to disclose.

# Learning Objectives

At the end of this session, learners should be able to:

- Recall the pharmacologic properties, indications, and differences between contrast agents
- Outline patient-specific factors such as renal function and allergy history that influence safe contrast agent selection
- Evaluate concomitant medications to determine appropriate management surrounding contrast administration

# Outline

Review contrast agents and background

Recognize allergies and which allergies are important to specific agents

Review renal dose adjustments and pre-medications required

Pharmacist considerations for contrast agents

- Safe medication administration surrounding contrast administration

Assess appropriate dosing, agent selection, and timing based on patient-specific factors

# Abbreviation Key

AKI: acute kidney injury

bPS: biologically derived secretin

CA-AKI: contrast-associated acute kidney injury

CKD-EPI: chronic kidney disease – epidemiology (recommended by National Kidney Foundation)

CT: computed tomography

CNS: central nervous system

CTA: computed tomography angiography

eGFR: estimated glomerular filtration rate

GBCA: gadolinium-based contrast agents

GI: gastrointestinal

HOCM: high osmolar contrast media

ICM: iodinated contrast media

IOCM: iso-osmolar contrast media

IV: intravenous

LOCM: low osmolar contrast media

MRI: magnetic resonance imaging

NSF: Nephrogenic Systemic Fibrosis

PET: positron emission tomography

PICC: peripherally inserted central catheter

SCr: serum creatinine

SJS: Stevens-Johnson Syndrome

# General Overview

# Types of Imaging that Use Contrast

- Angiography – Iodinated and gadolinium-based contrast agents, barium, microbubbles agents
- CT – Iodinated, barium
- MRI – Gadolinium
- Mammography – Iodinated
- PET – FDG, NaF, Gallium-68, F-18, Carbon-11, Oxygen-15, Ammonia-13, Choline-based tracers, acetate-based tracers
- Radionuclide scanning – Barium
- Ultrasound – Microbubble agents

# Routes of Administration

- Barium
  - Oral, rectal
- Gadolinium
  - IV, aortic (through power injector)
- Iodinated
  - Oral, rectal, bladder instillation, IV, intra-arterial, intrathecal

# Osmolality

Represents number of osmotically active particles in a suspension (per kg of solvent)

Closer osmolality to blood, increase in tolerability and safety profile

- High-osmolar (HOCM): 1800 – 2100 mOsm/kg
- Iso-osmolar (IOCM): 290 mOsm/kg
- Low-osmolar (LOCM): 200 – 900 mOsm/kg

IOCM/LOCM known to have higher tolerability, especially in terms of CA-AKI

# Ionicity

- Ionic agents: salts, hyperosmolar to blood
  - Dissociates in water as anionic and cationic components
  - DO NOT USE: CNS or bronchial imaging
- Nonionic agents: low-osmolar
  - Do not dissociate in water
  - Fewer adverse events

Mafraji MA. Radiographic contrast agents and contrast reactions. *Merck Manual Professional Edition*. Reviewed/updated November 2023. Accessed February 27, 2026.  
<https://www.merckmanuals.com/professional/special-subjects/principles-of-radiologic-imaging/radiographic-contrast-agents-and-contrast-reactions>

Everson M, Sukcharoen K, Milner Q. Contrast-associated acute kidney injury. *BJA Educ*. 2020;20(12):417-423. doi:10.1016/j.bjae.2020.07.006

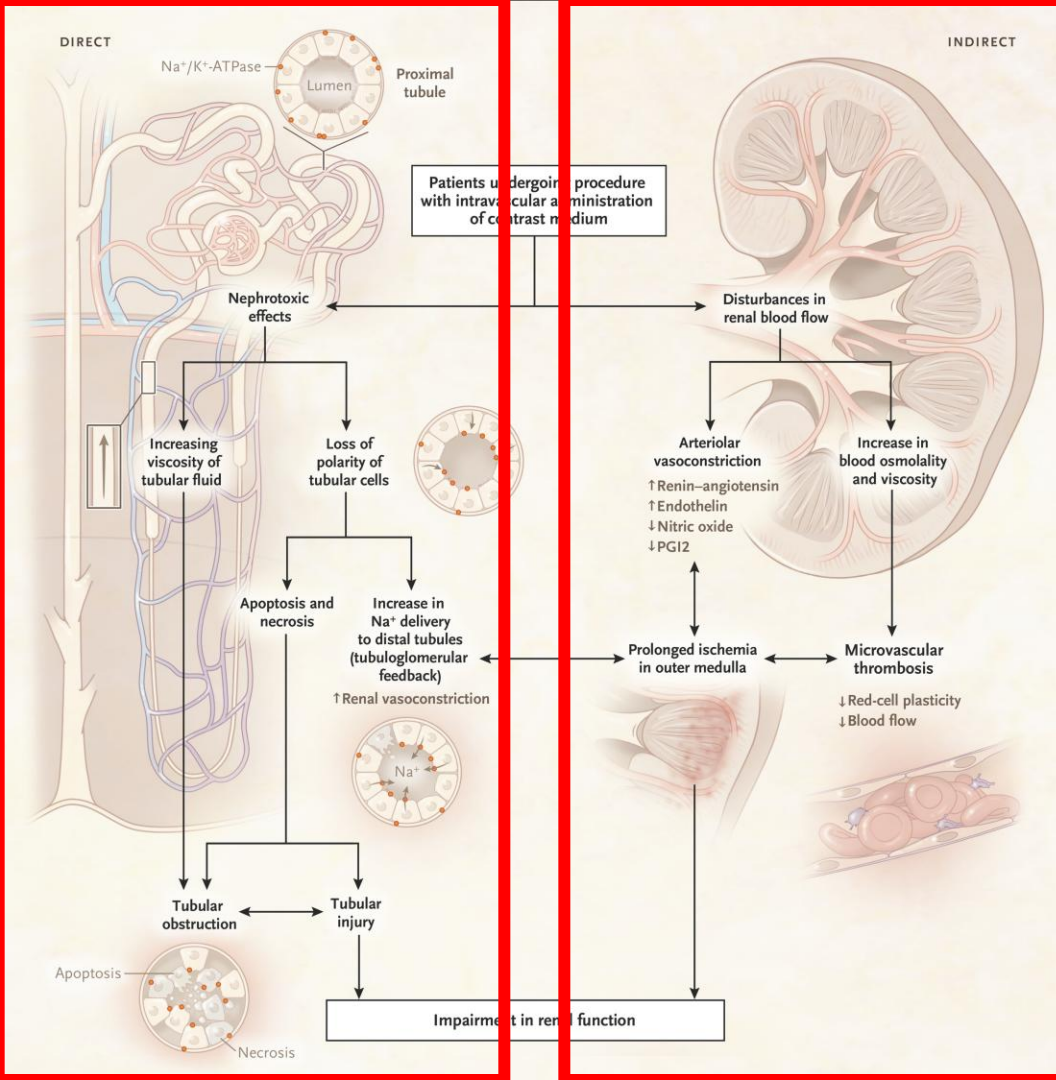
# Assessment Question #1

Which statement is correct regarding pharmacologic properties of contrast agents?

- a. High-osmolar agents are typically well tolerated
- b. Ionic agents are hyperosmolar leading to poor tolerability
- c. Non-ionic agents are hyperosmolar leading to poor tolerability
- d. Low-osmolar agents have similar rates of CA-AKI compared to high-osmolar agents

# Contrast Agent Reactions

- AKI definition:
  - Absolute SCr increase  $\geq 0.3$  mg/dL
  - Increase in SCr by  $\geq 50\%$
  - UOP reduced to  $\leq 0.5$  mL/kg/hr for at least 6 hours
- CA-AKI (contrast-associated acute kidney injury)
  - Within 48 hours of contrast administration
- Preventative measures
  - Hydration
  - Using IOCM or LOCM
    - No clear advantage for IOCM over LOCM
  - Reduced dose
- Risk factors:
  - Preexisting renal insufficiency
  - DM, especially with associated CKD
  - HTN
  - HF
  - Multiple myeloma
  - Age > 70 yrs
  - Use of other nephrotoxic agents
  - dehydration



# Anatomy of CA-AKI

Mandurino-Mirizzi A, Munafò A, Crimi G. Contrast-associated acute kidney injury. *J Clin Med.* 2022;11(8):2167. doi:10.3390/jcm11082167

Permission of use by Mehran R, Dangas GD, Weisbord SD

Mehran R, Dangas GD, Weisbord SD. Contrast-associated acute kidney injury. *N Engl J Med.* 2019;380(22):2146-2155. doi:10.1056/NEJMr1805256

Weisbord SD, Gallagher M, Jneid H, et al. Outcomes after angiography with sodium bicarbonate and acetylcysteine. *N Engl J Med.* 2018;378(7):603-614. doi:10.1056/NEJMoa1710933

# Contrast Agent Reactions

- Extravasation
  - Occur in 0.1 - 1.2% of CT injections
- Risk factors:
  - Altered circulation, injection into specific body parts (hand, foot, ankle), higher viscosity agents
- Minimizing risk:
  - Proper insertion, central line, slower infusion rates

# Contrast Agent Reactions

## Allergic-type reactions

- Vary in severity
- Can be immediate or delayed
  - Delayed reactions are more dermatological and can range from urticaria to SJS
- Risk factors for anaphylaxis: previous reaction to contrast agents, asthma, allergies

## Treatment

- Mild reactions: diphenhydramine 25 – 50 mg IV
- Moderate or severe: may include oxygen, epinephrine, IV fluids, atropine for bradycardia
- Add-ons: Prednisone 50 mg PO or Hydrocortisone 200 mg IV

American College of Radiology (ACR) Committee on Drugs and Contrast Media. *ACR Manual on Contrast Media*. American College of Radiology; 2025. Accessed February 27, 2026.

Mafraji MA. Radiographic contrast agents and contrast reactions. *Merck Manual Professional Edition*. Reviewed/updated November 2023. Accessed February 27, 2026.  
<https://www.merckmanuals.com/professional/special-subjects/principles-of-radiologic-imaging/radiographic-contrast-agents-and-contrast-reactions>

# Aurora Health Care Guidelines for Contrast Reaction Management

Urticaria	Hypotension	Laryngeal Edema	Bronchospasm
<p><b>Asymptomatic:</b> No treatment needed</p> <p><b>Symptomatic:</b></p> <ul style="list-style-type: none"> <li><b>Mild or moderate:</b> diphenhydramine 25-50 mg PO, IM, or IV slowly over 1-2 mins <b>OR</b> Loratadine 10 mg PO</li> <li><b>Severe:</b> Diphenhydramine 25-50 mg IM or IV slowly over 1-2 mins</li> </ul>	<p><b>All forms:</b> Elevate legs or Trendelenburg, Oxygen 6-10 L/min via mask, 0.9% normal saline or Lactated Ringer's (1000 mL rapidly)</p> <ul style="list-style-type: none"> <li>With Bradycardia Severe or unresponsive: Atropine 0.6-1 mg IV into running fluids, repeat every 3-5 minutes (Total 3 mg)</li> <li>With Tachycardia <b>Severe or Unresponsive:</b> <u>Call Code</u> Epinephrine 1 mL (0.1 mg) slowly IV, Repeat every few minutes (Total 1mg (10mL))</li> </ul>	<p><b>All Forms:</b> Oxygen 6-10 L/min via mask, Epinephrine 0.3 mL (0.3 mg) IM, Repeat every 10-15 minutes (Total 1 mg (1 mL))</p> <p><b>OR</b></p> <p>Adult epinephrine auto injector 0.30 mL (0.30 mg)</p> <p><b>Hypotensive:</b> Epinephrine 1mL (0.1mg) slowly IV, Repeat every 5-15 min (Total 1 mg (10mL))</p> <p><u>Call Code or intubation</u></p>	<p><b>All Forms:</b> Oxygen 6-10 L/min via mask, albuterol (90 mcg/puff) 2 puffs, up to 3 times</p> <p><b>Moderate, without hypotension:</b> Epinephrine 0.3 mL (0.3 mg) IM, Repeat every 10-15 minutes (Total 1 mg (1mL))</p> <p><b>OR</b></p> <p>Adult epinephrine auto injector 0.30 mL (0.30 mg)</p> <p><b>Severe, with hypotension:</b> <u>Call Code</u> Epinephrine 1mL (0.1mg) slowly IV, Repeat every few minutes (Total 1 mg (10mL))</p>

# Assessment Question #2

What can be co-administered during contrast administration to reduce risk of CA-AKI?

- A. 50 mg diphenhydramine orally x 1 dose
- B. 2 mL 20% acetylcysteine orally x 3 doses prior to procedure
- C. 500 mL saline IV bolus over 15 minutes
- D. 10 mg loratadine orally x 1 dose

# Barium

# Approved/Preferred Agents

Barium Products	
Generic	Brand
Barium sulfate (PO or Rectal)	Enterovu <sup>®</sup> , E-Z Cat <sup>®</sup> , E-Z Disk <sup>®</sup> , E-Z-HD <sup>®</sup> , E-Z-JUG <sup>®</sup> , E-Z-Paque <sup>®</sup> , E-Z-Paste <sup>®</sup> , Polibar ACB <sup>®</sup> , READI-CAT <sup>®</sup> 2, Varibar <sup>®</sup> , Volumen <sup>®</sup>

# Background

- What is it?
  - Radiopaque contrast media
  - Non-absorbable material that coats GI tract walls
- Commonly used in digestive system scans
  - Esophagus, stomach, intestines, and colon
  - PO or rectal per enema
- Enemas should NOT be used if bowel perforation is suspected

Mafraji MA. Radiographic contrast agents and contrast reactions. *Merck Manual Professional Edition*. Reviewed/updated November 2023. Accessed February 27, 2026.  
<https://www.merckmanuals.com/professional/special-subjects/principles-of-radiologic-imaging/radiographic-contrast-agents-and-contrast-reactions>

Mayo Clinic. Barium sulfate (oral route). Published September 30, 2024. Accessed February 27, 2026.  
<https://www.mayoclinic.org/drugs-supplements/barium-sulfate-oral-route/description/drg-20062255>

# Allergens/Side effects

- Screen for the following contraindications prior to use:
  - Previous allergic reactions to Barium sulfate
    - Hives, itching, or difficulty swallowing
- GI complications
  - Stool hardening
  - Stomach cramps
  - N/V/D

# Renal Considerations

- Low overall risk to kidneys
- No absorption
- Not metabolized
- Excreted via feces

# Pre-Medications and Dosing

- No premedication required
- Dosing is determined by individual product labeling

Drug	Concentration	Dosage
Barium Sulfate (E-Z-Disk®)	700 mg (tablet)	1 tablet PO with 1-2 swallows of water
Barium Sulfate (Readi-CAT® 2)	2.1% w/v (solution)	Oral: <ul style="list-style-type: none"><li>- 30 min protocol for abdomen give 300 mL 30 min before CT scan and 150 mL immediately prior to scan</li><li>- 90 min protocol for abdomen give 450 mL 90 min before CT scan and 150 mL 30 min before and 150 mL</li></ul>

# Gadolinium

# Background

- What is it?
  - Heavy earth metal with paramagnetic properties
  - Forms 3+ charge which produces tissue differentiation
- Injectable solution commonly used with MRIs
- Different formulations have different structure, ionicity, and concentration

# Approved/Preferred Agents

Gadolinium Products	
Generic	Brand
Gadoxetate Disodium (IV)	EOVIST®
Gadobutrol (IV)	GADAVIST®
Gadobenate Dimeglumine (IV)	MULTIHANCE®

# Allergens/Side effects

- Screen for the following contraindications prior to use:
  - Prior GBCA hypersensitivity reactions
- Injection site reactions
  - Minimal due to the small volume injected
- Gadolinium retention
  - No data shows it is associated with histologic changes indicative of neurotoxicity
- Severe
  - Physiologic: vasovagal reaction resistant to treatment, arrhythmia, convulsions, hypertensive emergency
  - Allergic-like: edema, wheezing/bronchospasm, significant hypoxia

# Renal Considerations

- eGFR < 30 mL/minute/1.73 m<sup>2</sup>: Use contraindicated
- People with kidney disease may have trouble clearing the contrast can cause build up in body
- Nephrogenic Systemic Fibrosis (NSF): Causes skin, muscles, and tendons to harden



Images used with permission from Perazella M, and Rodby R

Bayer HealthCare Pharmaceuticals. Eovist (gadoxetate disodium) injection: prescribing information. Accessed February 27, 2026.

<https://www.radiologysolutions.bayer.com/products/contrast-agents/eovist-injection-p>

Perazella M, Rodby R

Gadolinium-Induced Nephrogenic Systemic Fibrosis in Patients with Kidney Disease  
The American Journal of Medicine, 120, 561-562

# Nephrogenic Systemic Fibrosis

<b>Group I: Agents associated with the greatest number of NSF cases</b>	<b>Group II: Agents associated with few, if any, unconfounded cases of NSF</b>	<b>Group III: Agents for which data remains limited regarding NSF risk, but for which few, if any unconfounded cases of NSF have been reported</b>
Gadodiamide (Omniscan®) Gadopentetate dimeglumine (Magnevist®) Gadoversetamide (OptiMARK®)	Gadobenate dimeglumine (MultiHance®) Gadobutrol (Gadavist®) Gadoteric acid (Dotarem®) Gadoteridol (ProHance®) Gadopiclenol (Elucirem®)	No agents currently in this category

# Pre-Medications

No premedication required

If previous allergic reaction can consider steroid taper, and/or a first-generation antihistamine prior to administration of medication

Holding metformin is not necessary

# Dosing

Contrast Agent	Dose
Gadoxetate Disodium (EOVIST <sup>®</sup> )	0.025 mmol/kg actual bodyweight (0.1 mL/kg) IV administered 15-25 seconds before MRI
Gadobutrol (GADAVIST <sup>®</sup> )	0.1 mmol/kg actual body weight (0.1 mL/kg) IV immediately before MRI
Gadobenate Dimeglumine (MultiHance <sup>®</sup> )	0.1 mmol/kg actual body weight (0.2 mL/kg) IV immediately before MRI

Drugs.com. Gadavist dosage guide. Updated March 5, 2025. Accessed February 27, 2026.  
<https://www.drugs.com/dosage/gadavist.html>

US Food and Drug Administration. MultiHance (gadobenate dimeglumine) injection: prescribing information. Published 2010. Accessed February 27, 2026.  
[https://www.accessdata.fda.gov/drugsatfda\\_docs/label/2010/021357s009lbl.pdf](https://www.accessdata.fda.gov/drugsatfda_docs/label/2010/021357s009lbl.pdf)

Sakellariou S, Li W, Paul MC, Roditi G. Role of contrast media viscosity in altering vessel wall shear stress and relation to the risk of contrast extravasations. *Med Eng Phys*. 2016;38(12):1426-1433.  
doi:10.1016/j.medengphy.2016.09.016

**Iodinated**

# Background

- Water-soluble agent – administered intravascularly
- Uses: catheter angiography, cardiac aortography, urography, intrathecal myelography, etc.
- Can be used in oral or rectal for GI imaging -> particularly when barium is not recommended (ex: bowel perforation suspected)
- Commonly used with CT scans
  - Select agents approved for oral use
  - IV use
- Properties:

- High atomic weight

American College of Radiology (ACR) Committee on Drugs and Contrast Media. *ACR Manual on Contrast Media*. American College of Radiology; 2025. Accessed February 27, 2026.

Mayo Clinic. Barium sulfate (oral route). Published September 30, 2024. Accessed February 27, 2026. <https://www.mayoclinic.org/drugs-supplements/barium-sulfate-oral-route/description/drg-20062255>

# Approved/Preferred Agents

Iodine Products	
Generic	Brand
Diatrizoate Meglumine (urethral)	Cystografin® 30%, Sinografin®
Iothalamate Meglumine (IV or urethral)	Conray®, Cysto-Conray II®
Diatrizoate Meglumine Sodium (oral or rectal)	Gastrografin®
Ioxaglate Meglumine 39.3% (IV, intra-arterial)	Hexabrix®
Iohexal (IV, PO, intra-arterial, IT)	Omnipaque® (180, 240, 300)

# Viscosity

- Thickness of agent can enhance iodine delivery
  - Higher viscosity values
- Can be associated with higher extravasation risk
  - Higher vessel wall shear stress and vessel wall pressure

# Prior to Administration

- Screen for the following contraindications prior to use:
  - Previous allergic reactions to contrast agents
    - History of moderate-to-severe reaction
  - Predisposing factors for CA-AKI
    - SCr testing is required prior to use

# Allergens & Toxicities

- Allergic reactions
  - Iodine agents have highest allergic reaction risk, but still relatively uncommon
    - 0.6% risk, 0.04% risk of severe reaction
- Extravasation
  - Related to osmolality

# Aurora Health Care Policy for Iodinated Agents

- Contraindications:
  - Previous severe reaction to iodinated contrast
  - eGFR < 30 mL/minute/1.73m<sup>2</sup>
- Only *low osmolar contrast media* are approved for intravascular use

# Pre-Medication Recommendations

Risk Factor	Premedication Recommendations
Patients with history of severe reaction to iodinated contrast	*Patients should be premedicated if patient must receive
Patients with history of mild/moderate reaction to iodinated contrast	Patients should be premedicated
Patients with asthma	Patients do not need to be premedicated
<del>*Patients that have this risk factor are recommended to avoid use of iodinated contrast agents</del> Patients with history of allergy to contrast agent other than iodinated contrast	Patients do not need to be premedicated
Patients with shellfish or povidone/iodine	Patients do not need to be

# Order set for Premedication

For patients allergic to iodinated contrast media and able to take oral medications;  
Administer oral prednisone or methylprednisolone AND oral diphenhydramine as pre-mediations

- Prednisone (DELTASONE) tablet 50 mg
  - Administer 13 hours, 7 hours, and 1 hour prior to contrast media injection
- Diphenhydramine (BENADRYL) capsule 50 mg
  - Administer 1 hour prior to contrast media injection

OR

- Methylprednisolone (MEDROL) tablet 32 mg
  - Administer 12 hours and 2 hours prior to contrast media injection
- Diphenhydramine (BENADRYL) capsule 50 mg
  - Administer 1 hour prior to contrast media injection

# Order set

For patients allergic to iodinated contrast media and unable to take oral medications; administer intravenous hydrocortisone AND intravenous diphenhydramine as pre-medications

- Hydrocortisone (Solu-CORTEF) PF injection 200 mg every 4 hours
  - Administer over 1 minute
  - Administer 12 hours, 8 hours, and 4 hours to contrast media injection
- Diphenhydramine (BENADRYL) injection 50 mg
  - Administer ONCE 1 hour prior to contrast media injection

# Renal Considerations

- Most likely to cause CA-AKI
- SCr levels should be collected prior to administration

EGFR Value	Contrast Administration/Hydration Recommendations
>45	Administer contrast
30-44	Administer contrast with hydration if appropriate for the patient: IV hydration for inpatient and ED patients, or oral hydration for all other patients Documentation of hydration instructions in EMR will be made by the CT technologist
<30	Contrast should not be administered unless considered diagnostically

# Lactic Acidosis Risk

- Metformin increases the production of lactic acid in the intestines
  - Renally excreted, when renal function is insufficient metformin can build up increasing the lactic acid production
- Steps to prevent lactic acidosis
  - Hold metformin **48-hours following contrast study**
- Decreasing the risk
  - Hydration
  - Decreasing contrast used

American College of Radiology (ACR) Committee on Drugs and Contrast Media. *ACR Manual on Contrast Media*. American College of Radiology; 2025. Accessed February 27, 2026.

Aggarwal A, Smith JL, Chinnaiyan KM, et al.  $\beta$ -Blocker premedication does not increase the frequency of allergic reactions from coronary CT angiography. *J Cardiovasc Comput Tomogr*. 2015;9(4):270-277. doi:10.1016/j.jcct.2015.02.003

# Continuous use of metformin in patients receiving contrast medium: what is the evidence?

- A systematic review and meta-analysis of studies that compared patients that received metformin during contrast administration vs patients that did not receive metformin during contrast administration
- No evidence showing that continuing metformin during contrast administration is associated with a higher risk of CA-AKI, lactic acidosis, or renal dysfunction
  - No need to discontinue metformin in patients with eGFR > 30 mL/min/1.73m<sup>2</sup>

# Pre-Medications

- Metformin does not need to be held prior to contrast
  - Can be held post-administration in select patients
    - Minimum 48 hours
- IV or oral hydration for patients with eGFR of 30 – 44 mL/min
  - For patients requiring IV hydration, use order set: Rad Amb IP Sodium Chloride 0.9% PrePost Contrast Hydration
  - For patients requiring oral hydration, administer 2 cups (16 oz. or 500 ml) of water or equivalent fluid before contrast, and 1 cup (8 oz. or 250 ml) water or equivalent fluid per hour for 8 hours after contrast.

# Use of N-acetylcysteine to prevent contrast-induced nephropathy

- The study included 4993 patients with high risk for renal complications scheduled for angiography
- Secondary endpoint: CA-AKI

	IV Sodium Chloride		IV Sodium Bicarbonate	
	Acetylcysteine	Placebo	Acetylcysteine	Placebo
CA-AKI	8.2%	8.4%	10%	9%

- In the **acetylcysteine group 9.1%** developed an AKI, compared to **8.7% placebo**
- Was shown not to be effective

# "Iodine allergy: Common misperceptions"

- Patients who report adverse events to iodine-containing substances often get labeled as having an "iodine allergy"
- A literature review of 81 articles showed a lack of evidence to support the cross-reactivity between iodine-containing substances in patients labeled as having an iodine allergy
  - Many providers believe that shellfish and other seafood would cause a cross-reaction since shellfish contains iodine
- IgE-mediated seafood allergies have never been attributed to iodine
  - Major allergens in seafood proteins (tropomyosin and parvalbumin)

# "Iodine allergy: Common Misperceptions"

## Observational Study (n=32,964)

Patients in entire group who had a reaction to ICM	Patients with documented seafood (n=64) allergy who also had a reaction to ICM
1,814 (8.53%)	4/64 (6.25%)

- ***Patients with a seafood allergy are at no greater risk of allergic reaction than others***

## Large case review (n=112,003)

Patients with documented seafood allergy	Patients with documented seafood allergy who also had a reaction to ICM
201	31 (14.98%)

# Dosing

Procedure	Dosing Examples
Body Cavity Imaging	Endoscopic retrograde pancreatography, cholangiopancreatography (ERCP): <b>Intraductal:</b> Iohexol 240: 10 to 50 mL.
Intra-arterial Imaging	Abdominal aorta and its branches (celiac, hepatic, mesenteric, and splenic arteries): <b>Intra-arterial:</b> 30 to 60 mL. Aorta: 50 to 80 mL. Renal arteries: 5 to 15 mL.
Intrathecal Imaging	Myelography <b>Intrathecal</b> Lumbar (lumbar injection): Iohexol 180: 10 to 17 mL. Iohexol 240: 7 to 12.5 mL.
CT Imaging	Head imaging by injection: Iohexol 300: 70 to 150 mL. Iohexol 350: 80 mL.
Oral Imaging	Contrast enhanced abdominal and pelvis CT: <b>Oral:</b> Iohexol injection diluted to 6 to 12 mgI/mL or Iohexol 9 or 12 mgI/mL oral solution: 500 to 1,000 mL

# Ancillary Agents

# Glucagon

- Temporarily inhibits GI tract movement
  - Relax bowel during upper GI tract/colon imaging
- Can be advantageous during IV or image-guided percutaneous procedure
- Dosage for relaxation:
  - Stomach: 0.5 mg IV
  - Small bowel: 0.1 - 0.25 mg IV
  - Colon: 1 mg IV
- Adverse events:
  - Nausea/Vomiting - Limited by slower administration

# Metoclopramide

- Stimulate motility of upper GI tract & relax pyloric sphincter
  - Enhance gastric emptying & small bowel transit or to ease feeding tube placement
- Dosing: 10 mg IV/IM or 20 mg PO
- Contraindications: rare adrenal gland tumors, epilepsy

# Secretin

- Stimulate pancreatic secretion
- Enhance visualization of pancreatic duct
  - Aid in diagnosis of exocrine pancreatic dysfunction
- Dosing: 0.2 mg/kg IV injection

American College of Radiology (ACR) Committee on Drugs and Contrast Media. *ACR Manual on Contrast Media*. American College of Radiology; 2025. Accessed February 27, 2026.

U.S. Food and Drug Administration. *MultiHance (gadobenate dimeglumine) Injection: Prescribing Information*. Published 2010. Accessed February 27, 2026.  
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# Assessment Question #3

When would the use of glucagon be acceptable as an ancillary agent with contrast agents?

- A. To temporarily stimulate the GI tract during imaging of colon
- B. To temporarily relax the GI tract during imaging of colon
- C. To better visualize pancreatic secretion during imaging
- D. To better visualize stomach acid during GI tract imaging

# Summary/Conclusion

There is a wide variety of contrast agents used inpatient and outpatient for various indications.

It is important for pharmacists to be well-versed in knowledge of contrast agents, including:

- Dosing strategies
- Where to locate guidelines (AAH Share Point → Aurora Imaging (Wisconsin) → Contrast and Medications)
- When to use premedication
- When certain agents are contraindicated
- Ancillary agents that can be used

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# Questions?

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