Prevention Of Radiocontrast Nephropathy

- To select an imaging study, always use the least invasive procedure that will provide adequate diagnostic information.
- In patients with heart failure, hypotension or other cases of circulatory collapse, the administration of radiocontrast agents should be postponed, if patient's hemodynamic condition can be improved.
- If possible, repeated exposure to radiocontrast agents should be delayed for 48-72 hours, in particular in patients with impair renal function or diabetes.
- In patients with documented radiocontrast-induced nephropathy, if feasible, exposure to radiocontrast should be avoided until serum creatinine return to baseline levels.
- Although no clinical date is available to suggest that discontinuation of loop diuretics, NSAIDs, metformin, mannitol and ACE inhibitors are beneficial , if possible discontinue these agents for 24
- hours. This would decrease the severity of radiocontrast-induced nephropathy,or may protect kidney against development of contrast-induced nephropathy.
- And finally the smallest dose of radiocontrast should be used in high-risk patients.

Prevention:

- **IV fluids**
  - ½ Normal saline (0.45%) or Normal Saline (0.9%):
    - Start at least 24 hours prior to contrast study.
    - IV fluid rate should be approximately _____/hr (0.5-1.0 cc/kg/hour)
    - In patients who cannot receive IV fluids (*e.g.* CHF):

Your patient is probably still at the some risk for contrast nephropathy, regardless of whether you use these agents or not.

A) 150 mEq HCO3 in 1000 ml D 5% W:

a) Sodium bicarbonate: 154 mEq/L of sodium bicarbonate in dextrose and H2O mixed in the (154 ml of 1000 mEq/L sodium bicarbonate to 846 ml of 5% dextrose in H2O) slightly diluting the dextrose concentration to 4.23%.

b) **Protocol:** The initial intravenous bolus is **3 ml/kg per hour for 1** hour immediately before radiocontrast injection. Following this, patients should receive the same fluid at a rate of **1 ml/kg per hour during the contrast exposure and for 6 hours after the procedure**

B) Acetylcysteine:

a) The initial study on acetylcysteine was done in stable outpatients with chronic renal insufficiency and *not* in hospitalized patients. There has also been conflicting data regarding acetylcysteine's use in cardiac catheterization patients.

b) However, because of its low risk profile, it should be given as prophylaxis in all patients with risk factors.
c) Acetylcysteine is probably not a "wonder drug" for the prevention of contrast nephropathy.
d) Therefore, continue to use your clinical judgment in weighing the risks and benefits of obtaining a contrast study in your patient that is a risk for contrast nephropathy.
e) **Protocol: NAC 600 mg PO BID x 4 doses. Two doses on day prior to contrast study and two doses on day of contrast study.**

C) Fenoldopam:

a) There is some data to suggest that fenoldopam (a selective dopamine-1 (DA-1) receptor agonist) may have use in the prevention of contrast nephropathy.
b) Recent reports investigating the use of Fenoldopam in combination with hydration **did not** show a significant improvement in preventing radiocontrast nephropathy compared to hydration alone particularly in high-risk patient subsets including diabetics.
c) Should be Consider its use in very high risk patients and those patients with risk factors who are undergoing cardiac catheterization.
d) **Protocol:** start the infusion 15-30 minutes prior to the contrast study at a dose of **0.05 mcg/kg/minute to a maximum of 0.1 mcg/kg/minute.** Titrate up the dose to keep the systolic BP at least 90 mmHg **(fenoldopam can cause hypotension).** Continue the infusion for 6 hours after the contrast study is completed.

D) Theophylline:

a) The adenosine inhibitors theophylline and aminophylline may offer some renoprotection against radiocontrast nephropathy , but no single study has clearly demonstrated their use results in a better outcome than saline hydration alone, especially in patients with pre-existing renal dysfunction.