Clinical Pathways

Renal Injury

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Connecticut Children's

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What is a Clinical Pathway?

An evidence-based guideline that decreases unnecessary variation and helps promote safe, effective, and consistent patient care.

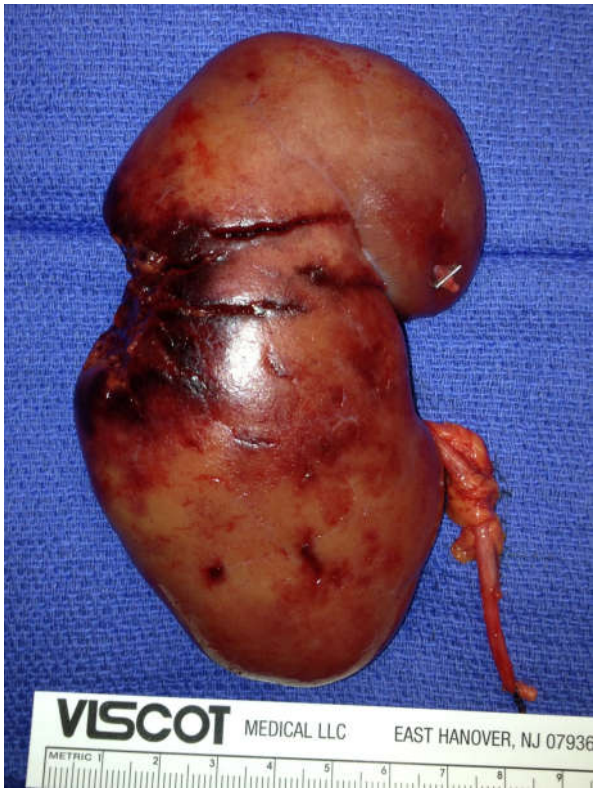
Pathway Objectives

- Standardize care to decrease variability in the management of patients with renal injuries
- Decrease length of stay to conform with current evidence-based guidelines
- Decrease unnecessary laboratory testing
- Avoid unnecessary PICU admissions
- Clearly delineate discharge criteria

Why is Pathway Necessary?

- The kidney is the most frequently injured urologic organ, with 70% to 80% being a consequence of blunt trauma.
- In the late 1990s, the American Pediatric Surgery Association (APSA) Trauma Committee developed non-operative management guidelines for blunt trauma to the abdomen to help standardize care.

Renal Injury Classification



Classification

- **grade I:** contusion or non-enlarging subcapsular perirenal haematoma, and no laceration
- **grade II:** superficial laceration <1 cm depth and does not involve the collecting system (no evidence of urine extravasation), non-expanding perirenal haematoma confined to retroperitoneum
- **grade III:** laceration >1 cm without extension into the renal pelvis or collecting system (no evidence of urine extravasation)
- **grade IV**
  - laceration extends to renal pelvis or urinary extravasation
  - vascular: injury to main renal artery or vein with contained haemorrhage
  - segmental infarctions without associated lacerations
  - expanding subcapsular haematomas compressing the kidney
- **grade V**
  - shattered kidney
  - avulsion of renal hilum: devascularisation of a kidney due to hilar injury
  - ureteropelvic avulsions
  - complete laceration or thrombus of the main renal artery or vein

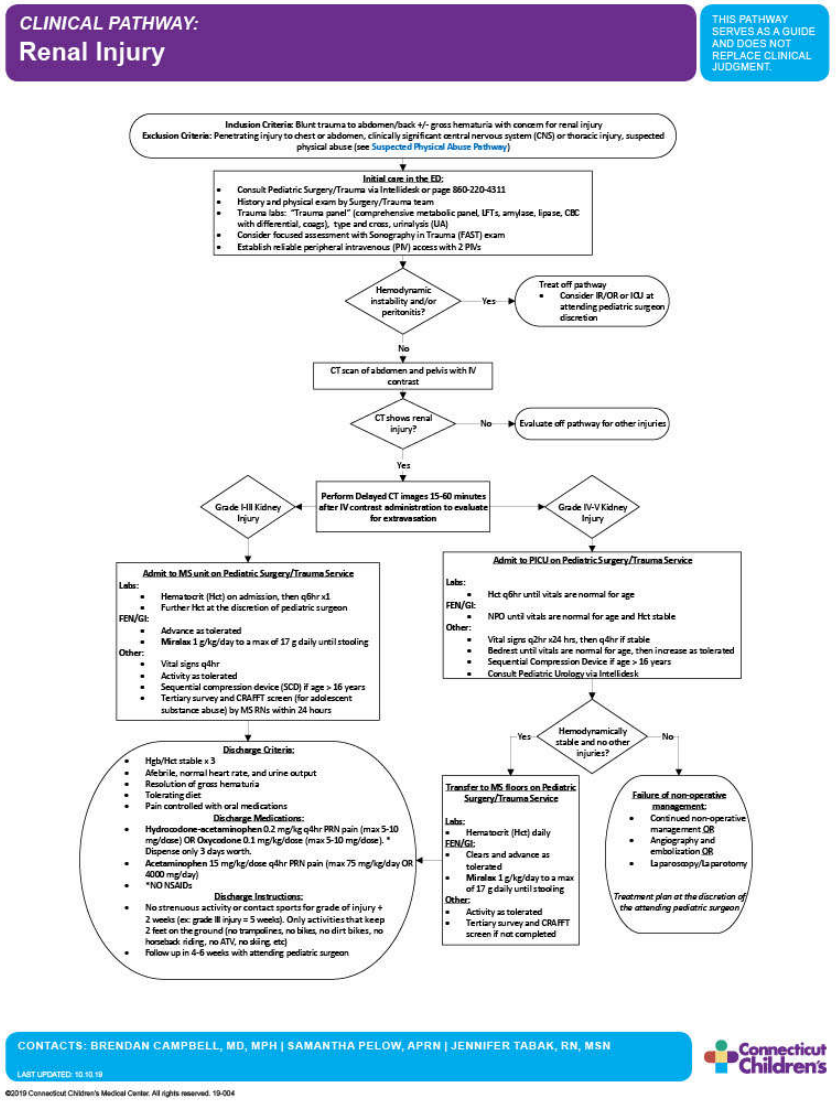
NB. advance one grade for bilateral injuries up to grade III.

A Radiologist will grade the injury using this scale.

Moore EE, Shackford SR, Pachter HL et-al. Organ injury scaling: spleen, liver, and kidney. J Trauma. 1989;29 (12): 1664-6.

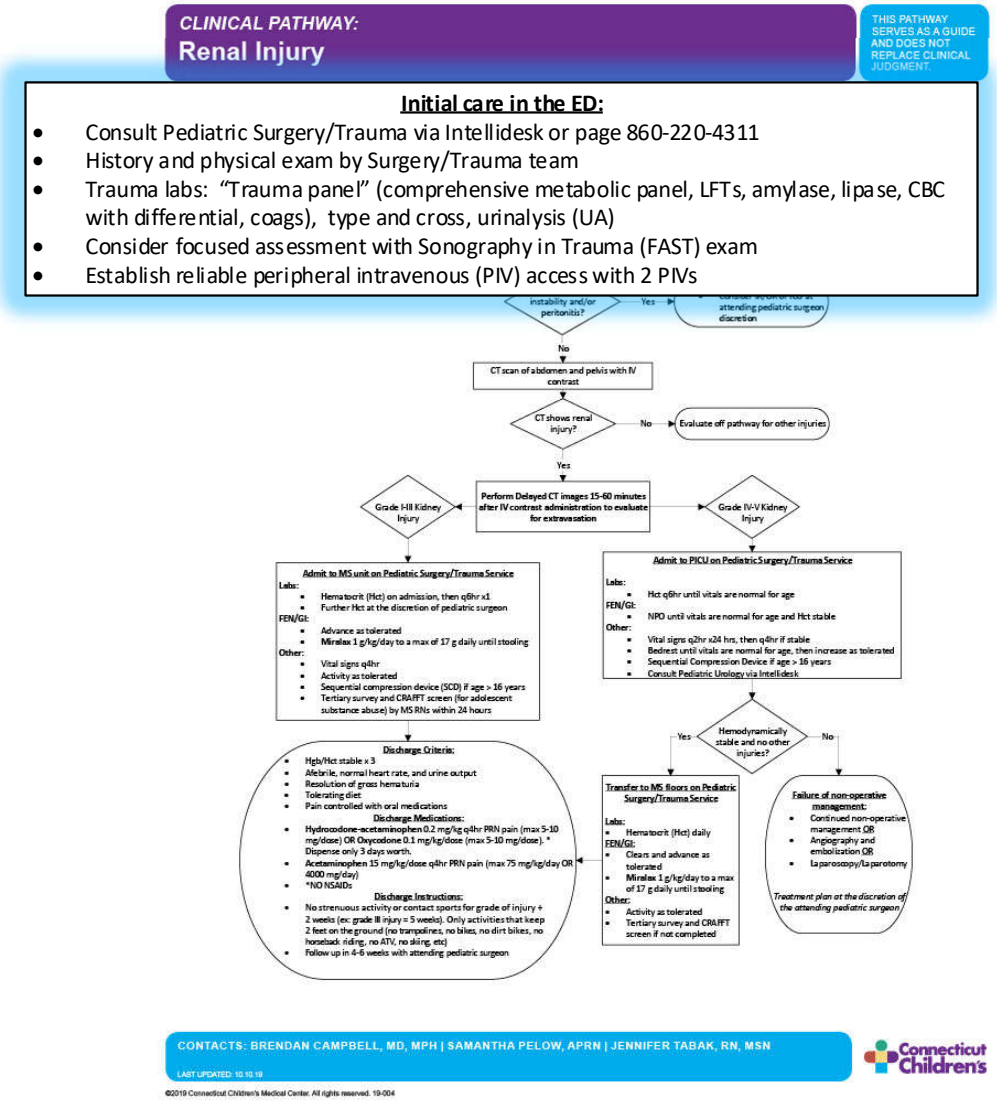
This is the Renal Injury Clinical Pathway.

We will be reviewing each component in the following slides.



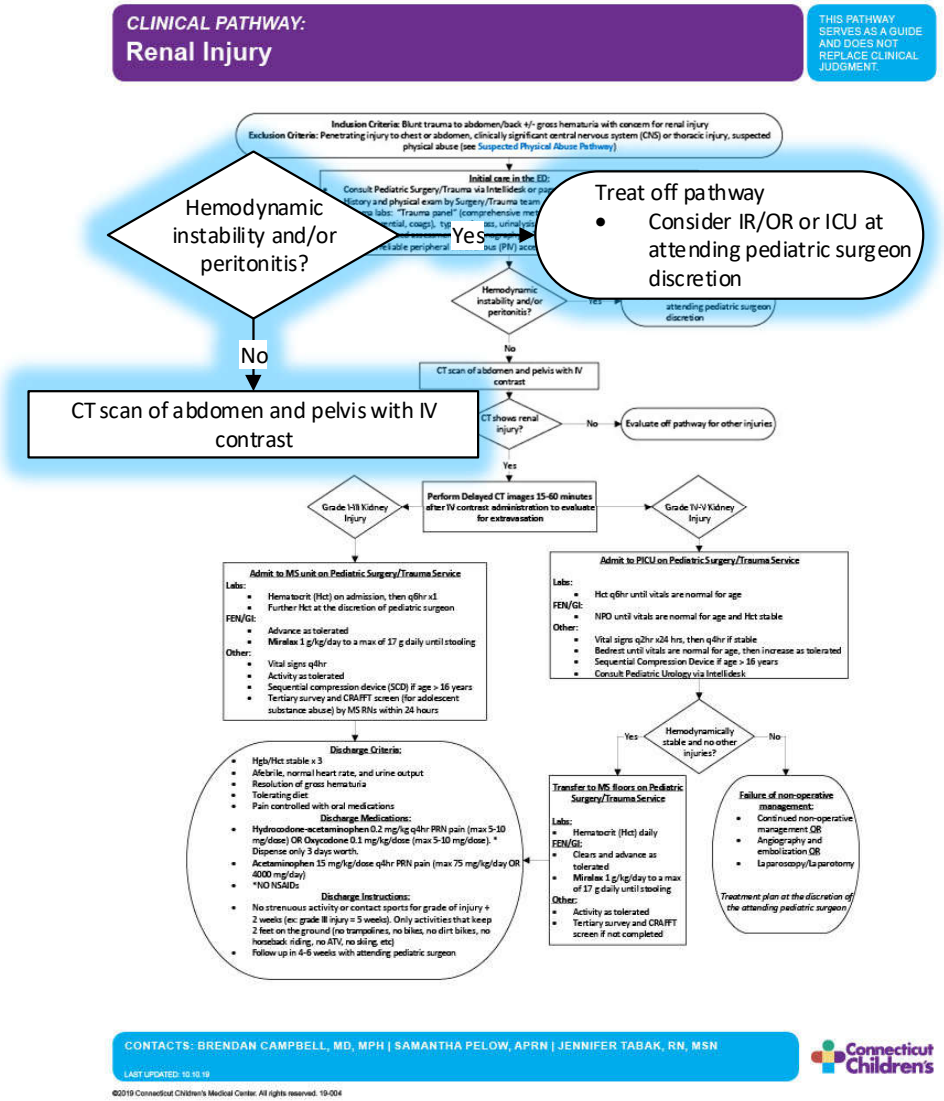
Initial care:

- Work up includes:
  - History and physical
  - Trauma Labs including amylase/lipase
  - CXR
  - Other exams should be considered based on presentation
- IV access should be established early
- Consult Pediatric Surgery if not already present for trauma team activation



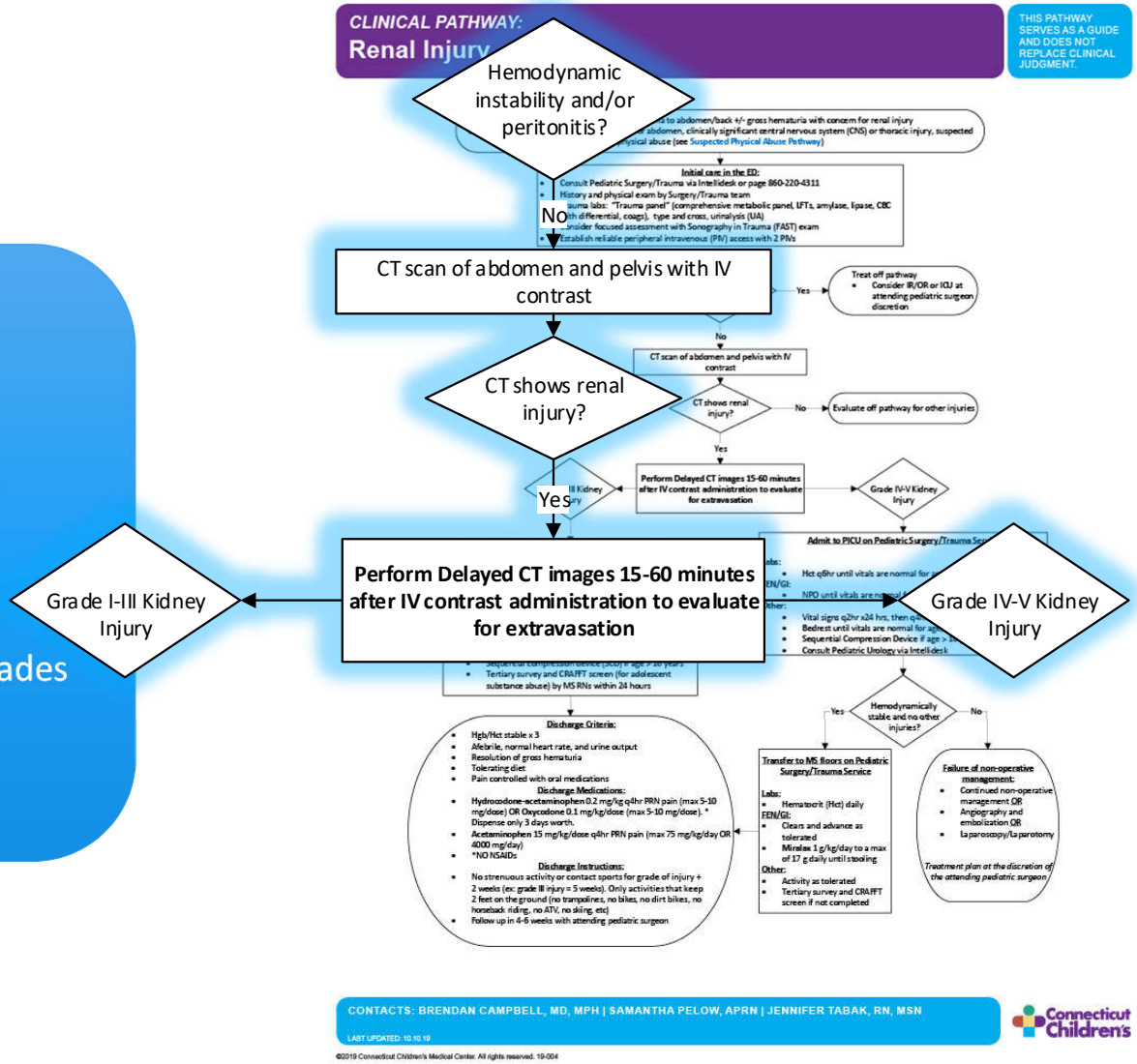
If the patient is hemodynamically unstable and/or has peritonitis:

- Patient should go immediately to the operating room (OR) for laparotomy
  - Notify OR and anesthesia STAT
- Consider blood transfusion and activation of the Massive Transfusion Protocol
- OR should not be delayed for imaging



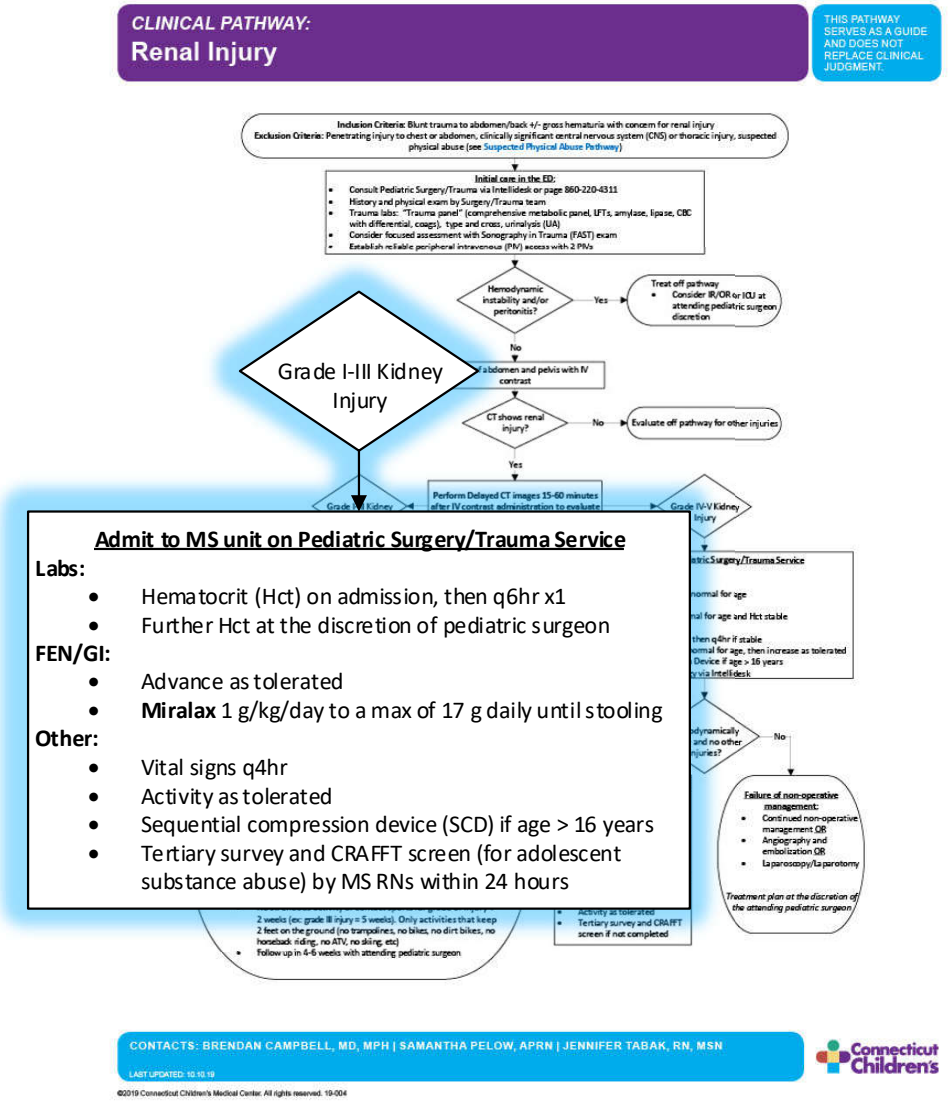
Stable patients:

- Need CT scan of Abdomen and Pelvis with Contrast
  - Delayed images should be obtained (15 minutes after initial study and up to 60 minutes after initial study) to look for extravasation
- CT scan is read by a Radiologist who then Grades the injury
  - Grade I-V, higher the grade the more significant the injury



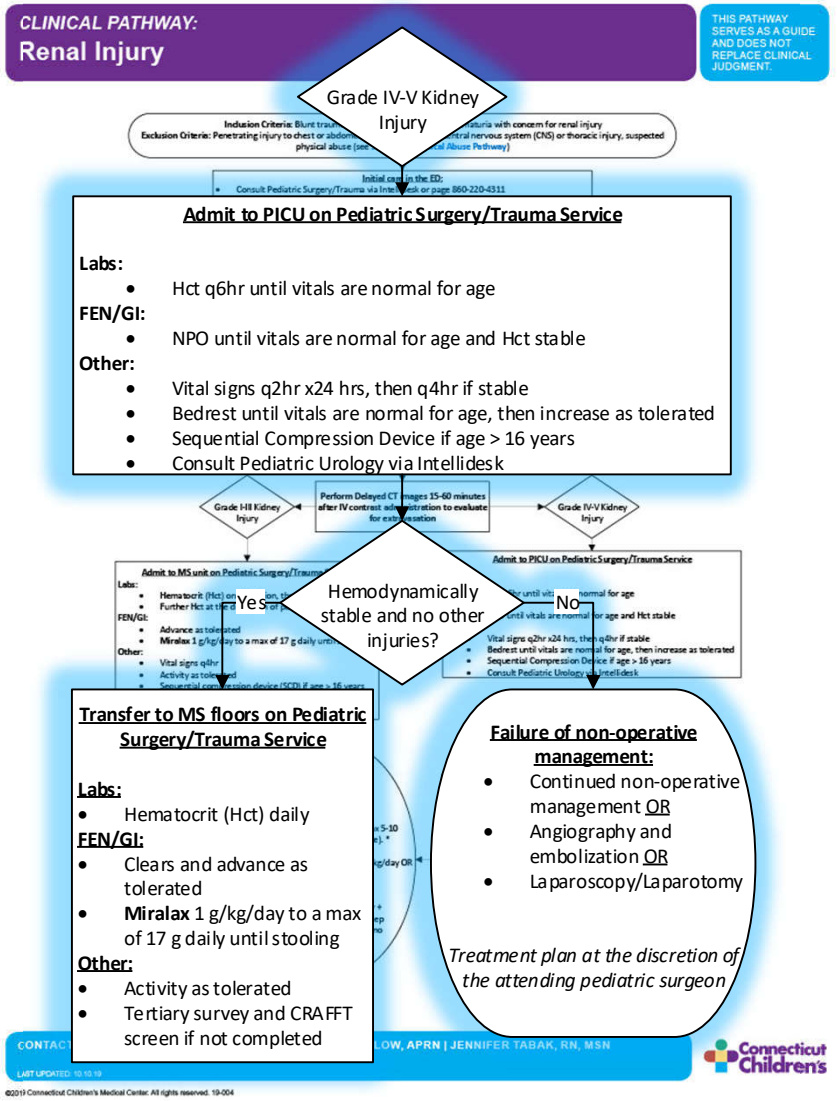
Grade I, II, or III injuries:

- Patients are admitted to Med/Surg unit
- Need Hct on admission then x1 after 6 hrs
- Activity and diet are as tolerated
  - Patients no longer require bedrest
- Pain control with Acetaminophen and Narcotics IV
- Miralax is started once patient starts clears



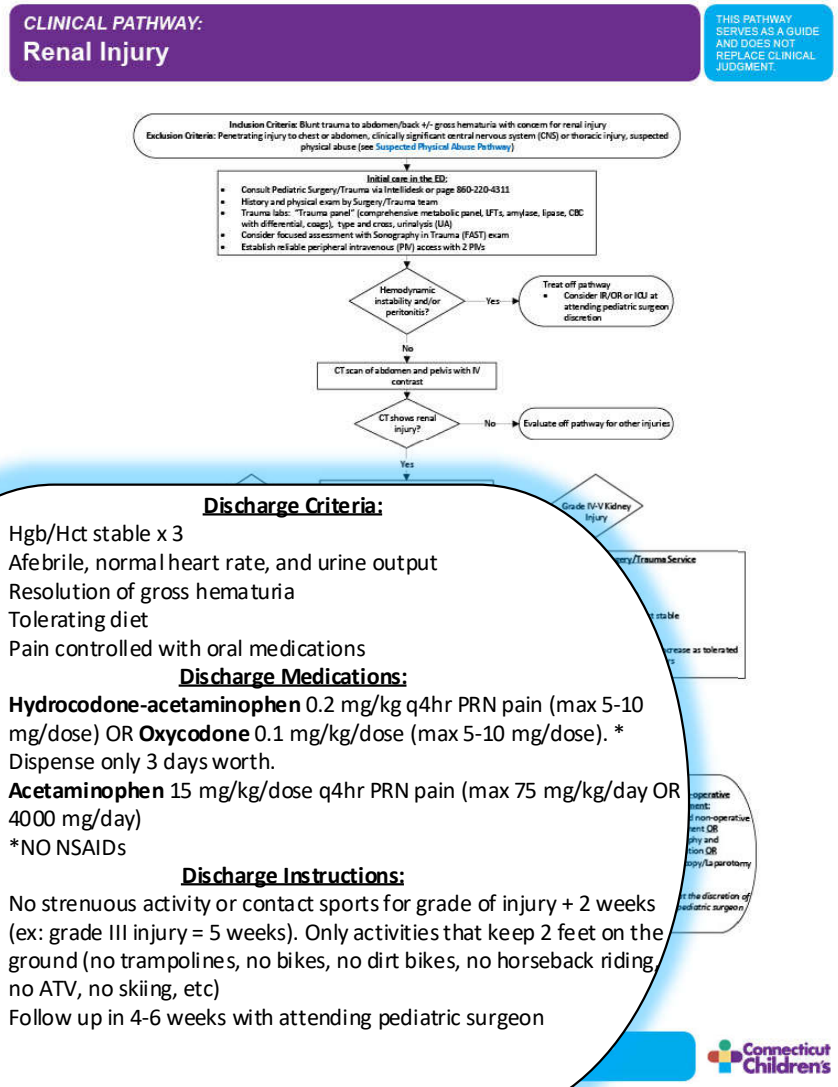
Grade IV or V injuries:

- Patients are admitted to PICU
- Labs, diet, vital signs, and activity are determined by a patients vital signs
- Once a patient is hemodynamically stable, they may be ready to transfer to the Med/Surg floors.



Discharge Planning:

- Medications:
  - 3 day supply of oral Hydrocodone/Acetaminophen or Oxycodone/Acetaminophen
  - Miralax
  - No NSAIDs
- Activity:
  - Duration of activity restriction is based on Grade of Injury + 2 weeks



Review of Key Points

- Renal injuries are Graded (I-V) based on CT scan findings (ideally) with delayed images to evaluate for contrast extravasation (urine leak).
- Serial Hematocrits are performed.
  - Based on the patients Grade of Injury and their vital signs
- There are no longer activity restrictions on patients with grade I-III kidney injuries.
- Patients with higher grade injuries (Grade IV-V) will remain NPO, with q6hr Hct, and bedrest until vital signs are normal for age.
- Discharge is based on physiology (e.g. heart rate, hematocrit) **NOT** grade of injury
- Duration of activity restriction at discharge is based on Injury Grade + 2 weeks

Quality Metrics

- Percentage of patients with pathway order set usage
- Percentage of patients with injury graded by radiologist
- Number of patients requiring embolization
- Number of patients requiring operative management
- Number of patients requiring blood transfusion
- Average length of stay (days)

Pathway Contacts

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  - Department of Pediatric Surgery and Trauma
- Jen Tabak, RN, MSN
  - Trauma Program Manager

References

- Matthews LA, Smith EM, Spirnak JP. Nonoperative treatment of major blunt renal lacerations with urinary extravasation. *J Urol*. 1997 June;157(6):2056-8.
- Moore EE, Shackford SR, Pachter HL, et al. Organ injury scaling: spleen, liver, and kidney. *J Trauma*. Dec 1989;29(12):1664-6.

Thank You!

About Connecticut Children's Clinical Pathways Program

Clinical pathways guide the management of patients to optimize consistent use of evidence-based practice. Clinical pathways have been shown to improve guideline adherence and quality outcomes, while decreasing length of stay and cost. Here at Connecticut Children's, our Clinical Pathways Program aims to deliver evidence-based, high value care to the greatest number of children in a diversity of patient settings. These pathways serve as a guide for providers and do not replace clinical judgment

This Educational Module was edited by:

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