UROLOGY CARE PATHWAYS

March 2018

1st Edition

GUIDE FOR UROLOGY RESIDENTS
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Academic Year 2017 - 2018

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Prefix Number 720-848-** 720-553-****

Long Distance Code dial 9*1(number) *82845 **| Translator** 81397, Code 1700

Amion: http://amion.com/. uco into the login in.

Text paging: SPOK - http://www.spok.com/

Uro Onc Clinic - 720-848-0170/1840

Gen Urology Clinic - 720-848-1800

Maroni/ Wilson Scheduler - 720-848-1388

OR Charge AIP - 83597/83512

OR Charge AOP – 81508

Anes Attd - 85920

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Courtenay (PRL) - 83784 (appointments, records, assist with follow-up appts, etc)

Michelle (PharmD) - 89756

Betsy: Nutrition pager - 303-266-4710

Acute Pain Service - 34426 |

SECURITY	**87777**
CODE BLUE, STROKE	**85555**
MET	**86388**
POLICE	**58888**

ANYTIME ANYWHERE	**88351**

Inpatient Units

AIP1

2	Critical Care Annex	84302
2	CT ICU (18-26)	86161
2	CT ICU (27-34)	86159
3	Burn ICU (18-26)	87583
3	Burn ICU (27-36)	81849
4	NICU (Neonatal)	85224
4	Women's Center	85233
5	Birth Center	84111
6E	Intrnl Med (19-36)	84301
6W	Transplant (1-18)	84551
7	Neurology (1-36)	87740
8E	Rehab (21-32)	83800
9	Pulmonary (1-36)	87579
10	MS PCU (1-36)	87578
11	BMT (1-36)	84275
12E	CTRC (19-23)	87907
12W	ACE/Suites	84751

AIP2

2	Neuro ICU (56-79)	85490
3	Cardiac ICU (62-73)	84500
3	Cardiac PCU(56-61, 74-79)	84560
3	Cardiac Post Proc (1-10)	84323
5	ST ICU (56-79)	86120
6	Surgical Spec (50-85)	87680
7	Med/Surg Care Unit	88680
8	Ortho (50-85)	87584
9	Med Spec (50-85)	84601
10	Medical ICU (56-79)	85492
11	Onc/Med/GYN (50-85)	88999

Hospital Services

Access Center	
Inpt Desk	84001
Fax	719-365-8283
DocLine	82828
BioMed	88351
Blood Bank	84444
Fax	84407
Cashier's Office	81029
CENTRAL SUPLY	84884
Decedent Affairs	84356
Pgr	266-7259
Dietary	84052
FNS Supervisor	87498
Fax	84053
Pager	266-0644
Dialysis - Acute	80900
Dialysis - Home	83102
DC Lounge	86867/87446
Echo	87555
ED	89111
ED Holding Area	86338
EEG Tech	87732/34
After Hrs Pager	266-3166
Employee Health	86849
Engineering Pager	266-4500
Financial Counseling	81025
Garden View Café	87339
Guest Services	84011
GI Lab	81330/82771/83909
Gift Shop	81076
Heart Center	85300
Help Desk	84000
Hepatology Clinic	82283
Hospital Manager	84296
Pager	266-9180
Human Resources	86801
Infection Control	87987
Interpreting Services	80397
Lab	84401
Supervisor	266-4888
Life Link	85465
Linen Pager	266-9883
Lost & Found	82458
Maintenance	88351
Pager	266-4500
Materials Mgmt	
Distribution	84027
Purchasing	82900
Medical Records	
M-F 8a-430p	81031
Eves & Wknds	81287
OIC	81300
Fax	81308
Oxygen Tanks	84027
Fax	82905
Pain Service Pager	266-6493
Patient Information	84011
Patient Rep	84222
PT/OT	83802
Pager	266-1802
PFT Lab	80842
PULM Rehab	87534
Radiation Onc	80100
Risk Management	47475
Social Work	84825
Speech	83802
Staffing Office	82617
Fax	80987
Sterile Processing	87120
Stress Test	85300
Fax	85301
Telemetry	87716
Fax	82792
Transport	84048
Supervisor	266-2046
Valuables Pager	266-1681
Vascular Lab	85300
Volunteer Office	81886
Wound RN	84684
Pager	266-4614

Pharmacy

Main (inpatient)	81389
ICU/OR	86128
Atrium	84083
AOP	81020
Pyxis Pager	266-0800
Discharge Pager	266-2687

Radiology

CT	86348
MRI	86011
Fax	80992
IR	87620
Nuc Med	81210/81200
Ultrasound	86340/86339
File Room	81104/05/06
After hrs Rad pager	266-6347
PICC	
Procedure	87599
Scheduling	87630
After hrs pager	266-1795
X-Ray	86343/86344

AIP OR

Pre-op	86252
OR	84351
OR Charge RN	83512
Anesthesia	85920
PACU	86203

CVC / CVHD

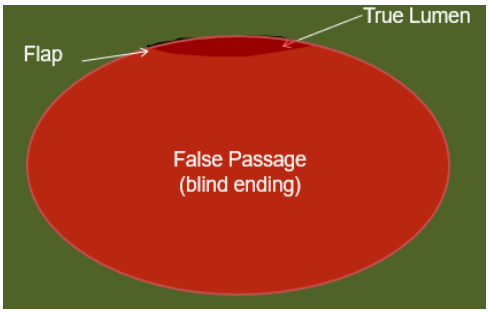
Pre-Post	87651
Brochcoscopy	87639
Electrophysiology	83589
Cath Lab	87636
IR	87620

Common Adult Urology Consults

1. Foley - Difficult
2. Fournier’s gangrene
3. Hematuria - Gross
4. Nephrolithiasis
5. Paraphimosis
6. Penile Fracture
7. Priapism
8. Trauma - Bladder
9. Trauma - Renal
10. Trauma - Ureteral
11. Trauma - Urethral

Common Adult Urology Consults

1. **Foley - Difficult**
   a. Do they need a Foley?
   b. History
      i. Previous GU surgeries, blood thinners, where did the previous Foley attempts meet resistance
   c. 18 Fr coude (BPH)
   d. 12 Fr silicone (urethral stricture)
   e. Cystoscopic Foley placement over a wire
      i. Consent
      ii. Recruit help
      iii. If false passage, true lumen usually at 12 (see picture →)
      iv. Wire can be difficult to remove
      v. Cook S Curve dilators for stricture



   f. SPT
      i. Consent
      ii. Examine for abdominal scars (i.e. previous lower abdominal surgeries)
      iii. Ensure bladder is full
      iv. Place under US guidance when possible
      v. SPT kit, spinal needle with syringe, suture, basic instrument set, local analgesia, skin prep, 11 blade

2. **Fournier's gangrene**
   a. Risk factors: DM, HIV, local trauma, paraphimosis, obesity, recurrent groin infections, recent surgery
   b. Exam: pain, swelling, erythema, crepitus, blistering
   c. Imaging: non-contrast CT pelvis (gas within soft tissue)
   d. LRINEC score (aids in diagnosis)
   e. Fournier's gangrene severity index (aids in prognosis)
   f. Immediate surgical intervention
      i. Aggressive debridement
      ii. Consider consulting General Surgery
      iii. Will likely require multiple take-backs, complex wound closure

3. **Hematuria - Gross**
   a. Check if latex allergy prior to placing urethral Foley
   b. If in clot retention, consider placing large 3-way (Rusch) catheter (22 or 24 Fr)
   c. Attempt to clear clot with manual irrigation
   d. Obtain bedside ultrasound to evaluate remaining clot burden prior to starting CBI
   e. Options for persistent, refractory (bladder) hematuria despite CBI
      i. Solutions
         1. Amicar (can use in VUR, can give systemically or in CBI)

2. Alum (can use in VUR)
3. Silver nitrate (cannot use in VUR, requires anesthesia)
4. Formalin (cannot use in VUR, requires anesthesia)

ii. To OR for clot evacuation
iii. Bilateral PNTs
iv. Hyperbaric oxygen
v. Bladder embolization
vi. Cystectomy (yikes)

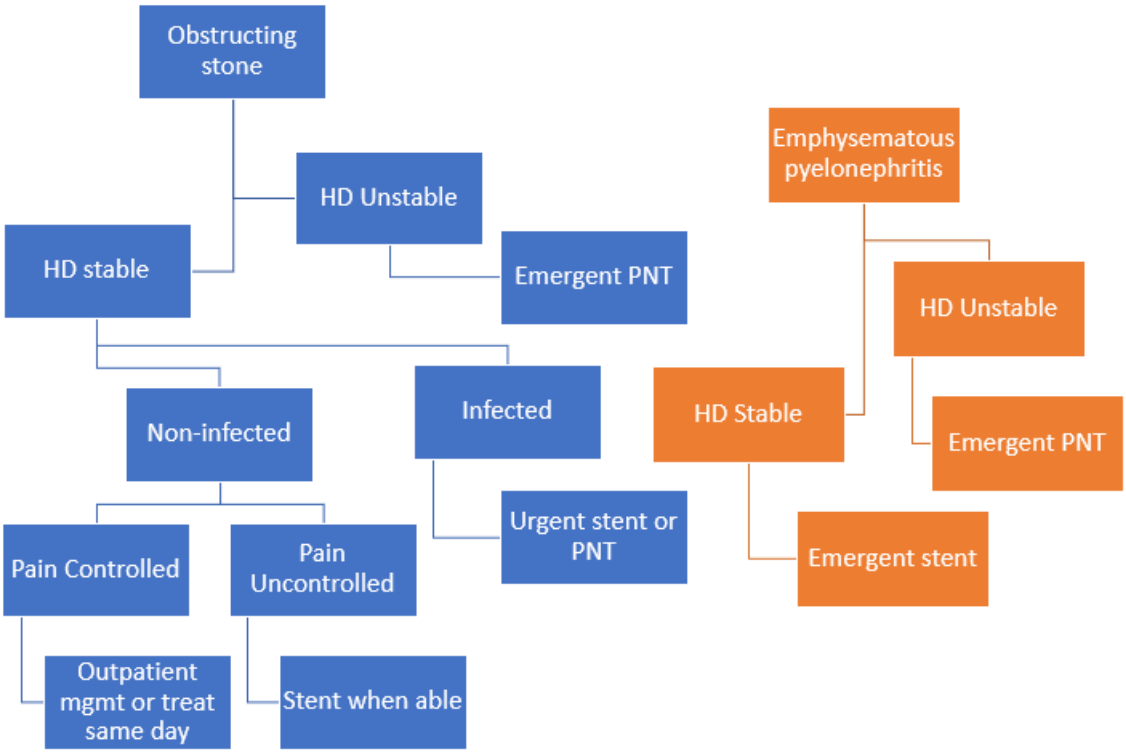
f. Do not forget outpatient hematuria work-up

4. Nephrolithiasis

a. Outpatient vs. Urgent vs. Emergent
b. Key information
   i. Vitals (?febrile, hypotensive, tachycardic, tachypneic)
   ii. Labs: CBC, BMP (Cr), UA (see below) with urine culture, coags (just in case PNT)
   iii. Imaging (usually CT KUB, sometimes RUS versus XR)
   iv. Medical comorbidities (DM, renal insufficiency, HIV)
   v. Symptoms (tolerating PO, fevers, pain level)
   vi. Previous trips to the ED for the same issue
c. Urinalysis
   i. Beware of “dirty UA”
      1. Straight cath > clean catch
         a. If many squamous cells, may be contaminated
   ii. RBCs and WBCs can be expected in the setting of stone
   iii. Nitrite positive
      1. Results of gram neg bacteria converting nitrate to nitrite
         a. Nitrite negative bacteria: streptococcus (enterococcus), pseudomonas
      2. Highly specific (90%), less sensitive (35-85%)
      3. Pyridium can cause nitrite + urine
   iv. Leukocyte esterase
      1. Produces by neutrophils
      2. Can have false negative if bacteriuria w/o pyuria

See pathways on following pages:

Common Adult Urology Consults

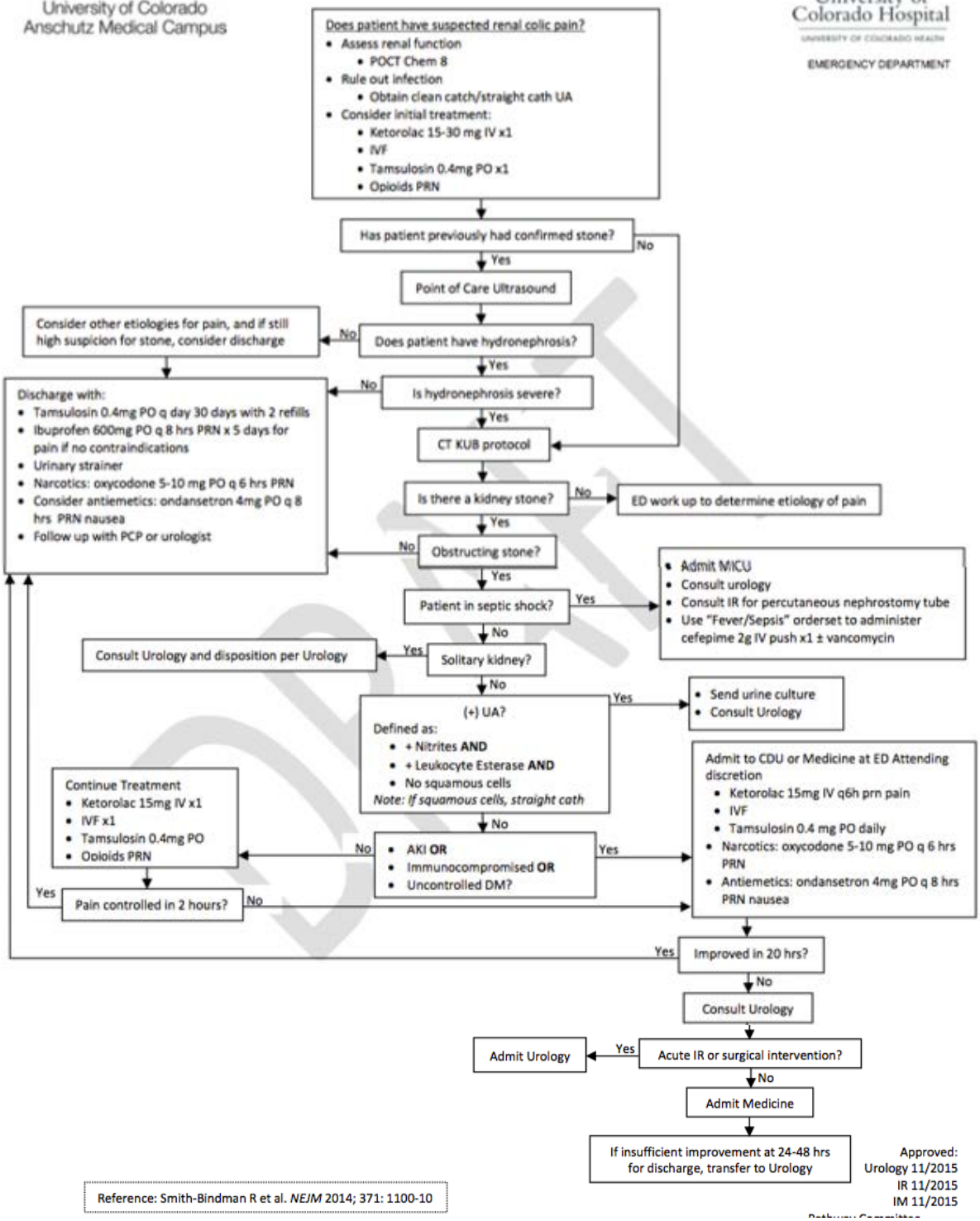


Common Adult Urology Consults

University of Colorado Anschutz Medical Campus

University of Colorado Hospital
EMERGENCY DEPARTMENT

Nephrolithiasis Pathway



Reference: Smith-Bindman R et al. *NEJM* 2014; 371: 1100-10

Approved:
Urology 11/2015
IR 11/2015
IM 11/2015

Common Adult Urology Consults

5. **Paraphimosis**
    a. Is the patient circumcised?
    b. Manual reduction
        i. Hold pressure for ~10-15 minutes to reduce edema (versus wrapping penis in Coban starting at glans)
        ii. Digits 2-5 on phimotic band, thumbs on glans
        iii. Push glans and pull phimotic band
    c. Dorsal slit (if manual reduction fails)
        i. Consent
        ii. Penile block (1% plain lidocaine or 0.25% plain bupivacaine)
        iii. Lubricate and slide straight snap under phimotic band, snap and leave in place a few minutes
        iv. Release snap, cut phimotic band with fine scissors
        v. Oversew edges with absorbable suture
    d. Circumcision

6. **Penile fracture**
    a. Tear in tunica albuginea over corpus cavernosum
    b. History
        i. Popping sound during intercourse, rapid detumescence
    c. Physical exam
        ii. “Eggplant”
    d. Some patients have concomitant urethral injury (3-20%)
    e. Surgical repair
        i. Controversial timing (emergent versus urgent)
        ii. Start with cystoscopy to rule out urethral injury
        iii. Circumcising incision, identify injury (+/- artificial erection), close tunica with 2-0 or 3-0 absorbable suture

7. **Priapism**
    a. AUA guideline on priapism
        i. http://www.auanet.org/guidelines/priapism-(2003-reviewed-and-validity-confirmed-2010)
    b. History
        i. Duration of erection, is it painful, previous episodes, medications (trazadone), recreational drug use (cocaine), sickle cell, trauma
    c. Work-up
        i. CBC with diff, coags, urine tox screen, corporal blood gas, consider placing a urethral Foley
    d. Ischemic (low flow)
        i. Painful
        ii. $PO_2 < 30$, $PCO_2 > 60$, $pH < 7.25$
    e. Non-ischemic (high flow)
        i. Non-painful
        ii. $PO_2 > 90$, $pCO_2 < 40$, $pH \sim 7.4$
        iii. Usually from trauma
        iv. Management is observation

1. Rarely, embolization

f. Corporal blood gas/aspiration/irrigation
   i. Consent
   ii. 19 or 21 gauge butterfly needle, 14 gauge angiocath
   iii. Prep skin, penile block, puncture into corporal body at 2 or 10 o'clock, send blood as an ABG
   iv. Alternate aspirate then irrigate with NS
   v. "Aspiration/irrigation alone may reduce priapism in approximately 1/3 of patients"
g. Phenylephrine
   i. Selective alpha1-adrenergic receptor agonist
   ii. Place patient on cardiac monitor (may result in HTN, tachycardia or reflex bradycardia)
   iii. Grab phenylephrine stick from anesthesia (pre-made concentration)
   iv. Phenylephrine should be diluted with NS to a concentration of 100-500 mcg/mL, and 1 mL injections made every 3-5 minutes
   v. Maximum dose is 1 mg of phenylephrine
h. Operative management (if aspiration, irrigation, phenylephrine fails)
   i. Distal shunt: T-shunt, Al-Ghorab, Winter
   ii. Proximal shunt: Quackels, Grayhack)
   iii. ?penile prosthesis if prolonged course of priapism

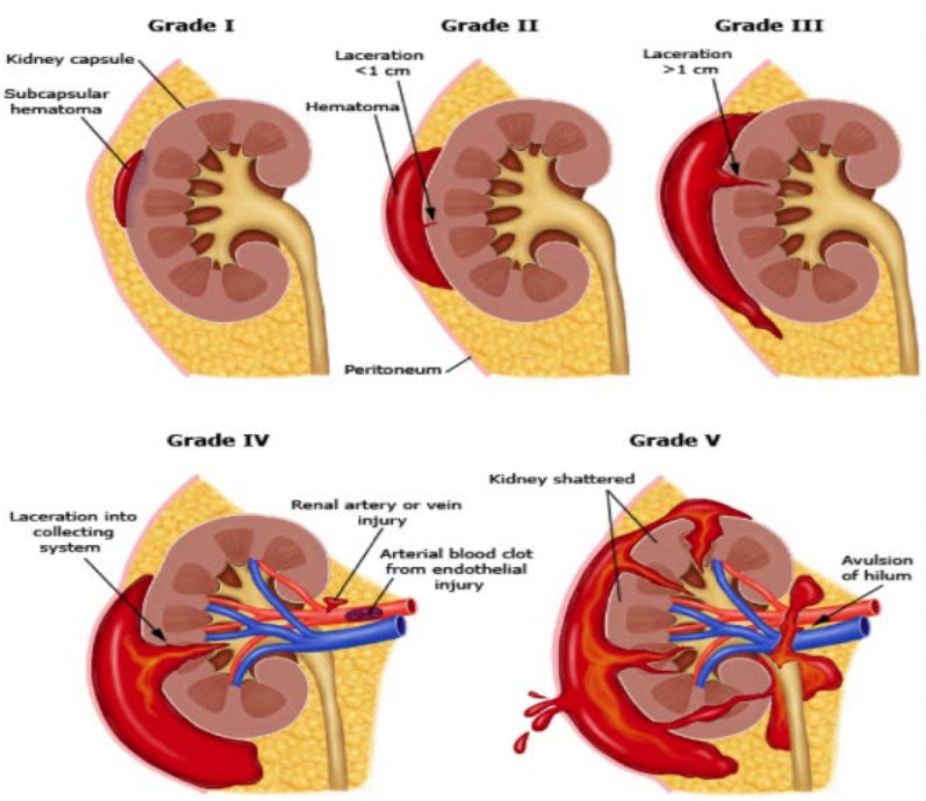
8. Trauma - Bladder

a. When to obtain imaging? (i.e. cystogram)
   i. Stable patients with gross hematuria and pelvic fracture
   ii. Stable patients with gross hematuria and a mechanism concerning for bladder injury, or in those with pelvic ring fractures and clinical indicators of bladder rupture
b. Intraperitoneal rupture
   i. Immediate surgical repair (ex lap)
c. Extraperitoneal rupture
   i. Treat conservatively with urethral Foley x2-3 weeks
      1. Consider f/u cystogram prior to urethral Foley removal
   ii. Scenarios to consider operative intervention of extraperitoneal bladder injuries
      1. Pelvic fractures that result in exposed bone in the bladder lumen
      2. Concurrent rectal or vaginal lacerations
      3. Bladder neck injuries
      4. Nearby orthopedic hardware
      5. Undergoing ex lap for other injuries

9. Trauma - Renal

a. "AUA guideline on urotrauma" http://www.auanet.org/guidelines/urotrauma-(2014-amended-2017

b. When to obtain imaging? (i.e. CT with IV contrast +/- delayed images)
    i. Stable blunt trauma + gross hematuria or microscopic w/ BP<90
    ii. Stable trauma with mechanism or PE concerning for renal injury
c. Conservative management
    i. Bedrest, serial H/Hs, +/- urethral Foley
    ii. “Use non-invasive management strategies in hemodynamically patients with renal injury”
    iii. HD stable grades I-IV
        1. ~98% can be successfully managed without exploration
    iv. HD stable grade V
        1. May be a role for observation
d. IR management (angiography with embolization)
    i. HD instability despite resuscitation
    ii. Bleeding from a renal segmental artery
e. Operative management
    i. HD instability despite resuscitation
    ii. Expanding/pulsatile renal hematoma (renal artery avulsion)
    iii. Commonly results in nephrectomy
    iv. Consider one-shot on table IVP prior to renal exploration to document function of the contralateral, uninjured kidney (2 mL/kg IV contrast and a single delayed image at 10-15 minutes)
    v. UPJ disruption, i.e. stent (controversial)
f. Long-term follow-up with PCP
    i. BP checks, UA



10. Trauma - Ureteral

f. When to obtain imaging? (i.e. CT with delayed imaging)
    i. Stable with suspected ureteral injury
g. Attempt RPG and ureteral stent placement when possible
h. Repair traumatic ureteral lacerations at the time of laparotomy in stable patients
i. Upper or middle (superior to iliac vessels)
    i. “Surgeons should repair ureteral injuries located proximal to the iliac vessels with primary repair over a ureteral stent, when possible”
    ii. Options: UU, less likely TUU, auto transplant, or ileal ureter
j. Lower (distal to iliac vessels)
    i. “Surgeons should repair ureteral injuries located distal to the iliac vessels with ureteral reimplantation or primary repair over a ureteral stent, when possible”
    ii. Options: ureteral reimplantation, psoas hitch, boari flap
k. Damage control
    i. “Surgeons may manage ureteral injuries in unstable patients with temporary urinary drainage followed by delayed definitive management” (i.e. tie off ureter and place PNT or externalize a feeding tube)
l. Keep in mind blast injury to surrounding tissue
    i. May lead to delayed ureteral stricture and/or ureteral necrosis

11. Trauma - Urethral

m. When to obtain imaging? (i.e. RUG)
    i. Blood at the urethral meatus after pelvic trauma
n. Consider urethral Foley attempt by an experienced member of the team (i.e. Urology resident, not intern)
o. Obtain prompt urinary drainage in patients with pelvic fracture associated urethral injury
    i. Urethral Foley, SPT, primary realignment (controversial)

Last revised 3/7/2018

Common Pediatric Urology Consults

1. 10 Most Common Consults at CHCO
2. Acute Painful Scrotum
3. Hydronephrosis
    a. Prenatal
    b. Postnatal
4. Myelomeningocele
5. Pyelonephritis
6. Renal Trauma
7. Testicular Torsion
8. Undescended Testicle
9. Urachal Anomalies
10. Urinary Tract Infection
11. Urolithiasis
12. Vesicoureteral Reflux (VUR)

Children's Hospital Colorado

Top 10 Most Common Pediatric Urology Consults at Children's Hospital Colorado[1]

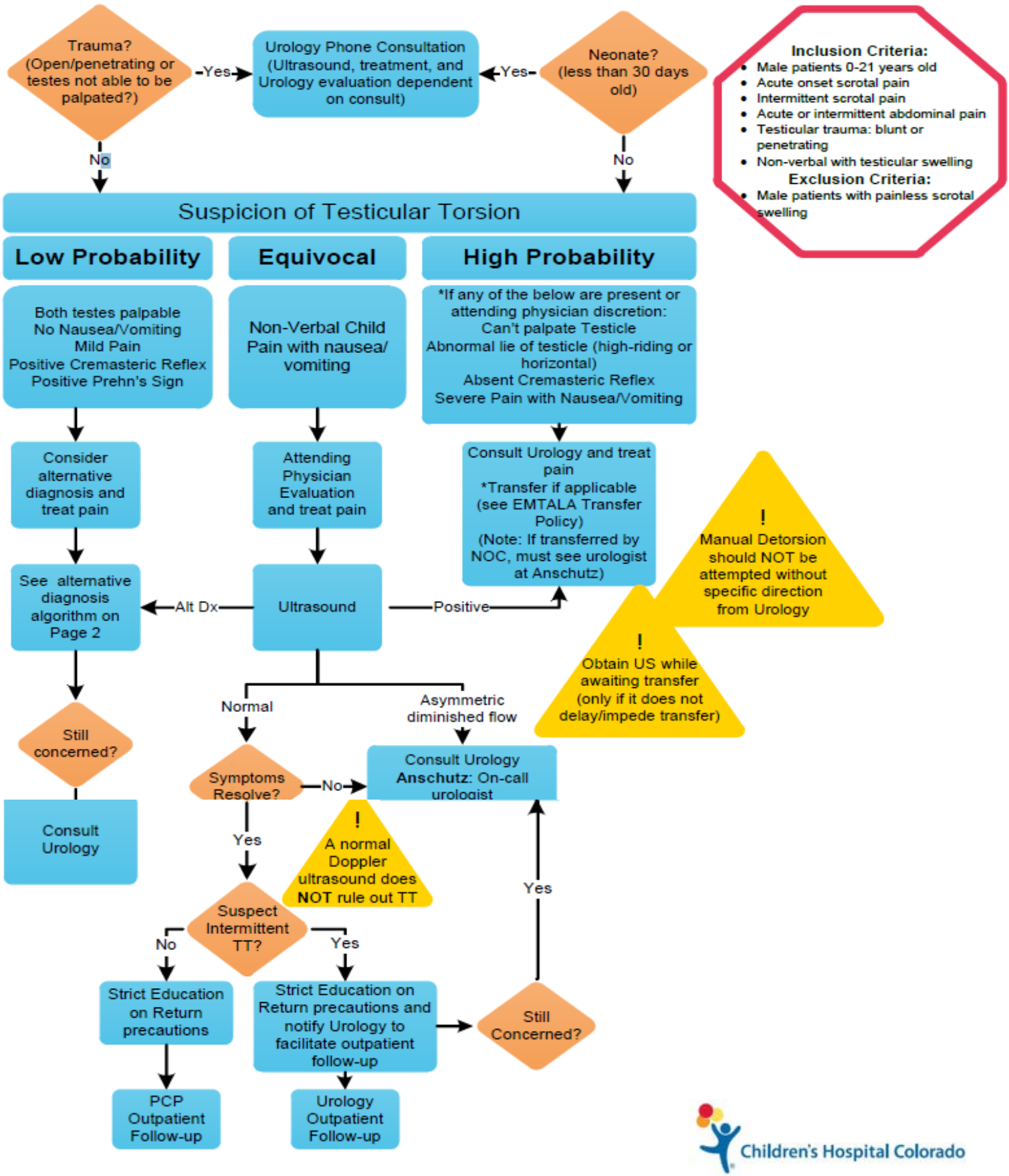
Consult	%
1. *Hydronephrosis*	14.2
2. *UTI*	11.1
3. *Urolithiasis*	8.5
4. *Testicular torsion*	7.4
5. *Urinary retention*	7.1
6. *Pyelonephritis*	6.8
7. *Neurogenic bladder*	6.3
8. *Vesicoureteral reflux*	3.4
8. *Catheter issue*	3.4
10. *Cloacal anomaly*	2.8

1. Rove KO, Warncke JC, Vemulakonda VM. *Trends in Pediatric Urologic Consultations in a Tertiary Care Hospital Setting*. Journal of Pediatric Urology. 2017; 1477-5131(17).

Children's Hospital Colorado

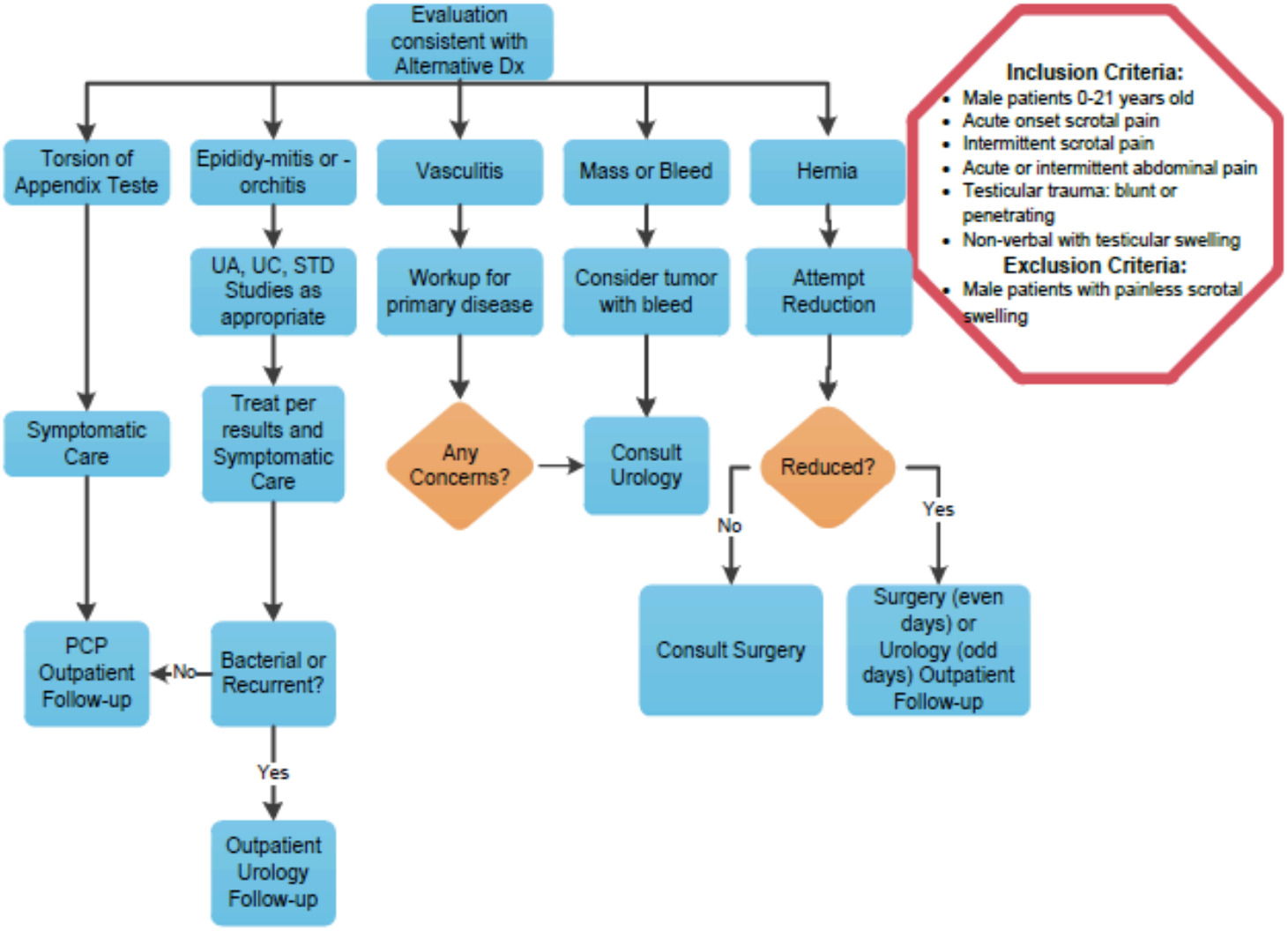
ACUTE PAINFUL SCROTUM

ALGORITHM- Suspicion for Testicular Torsion



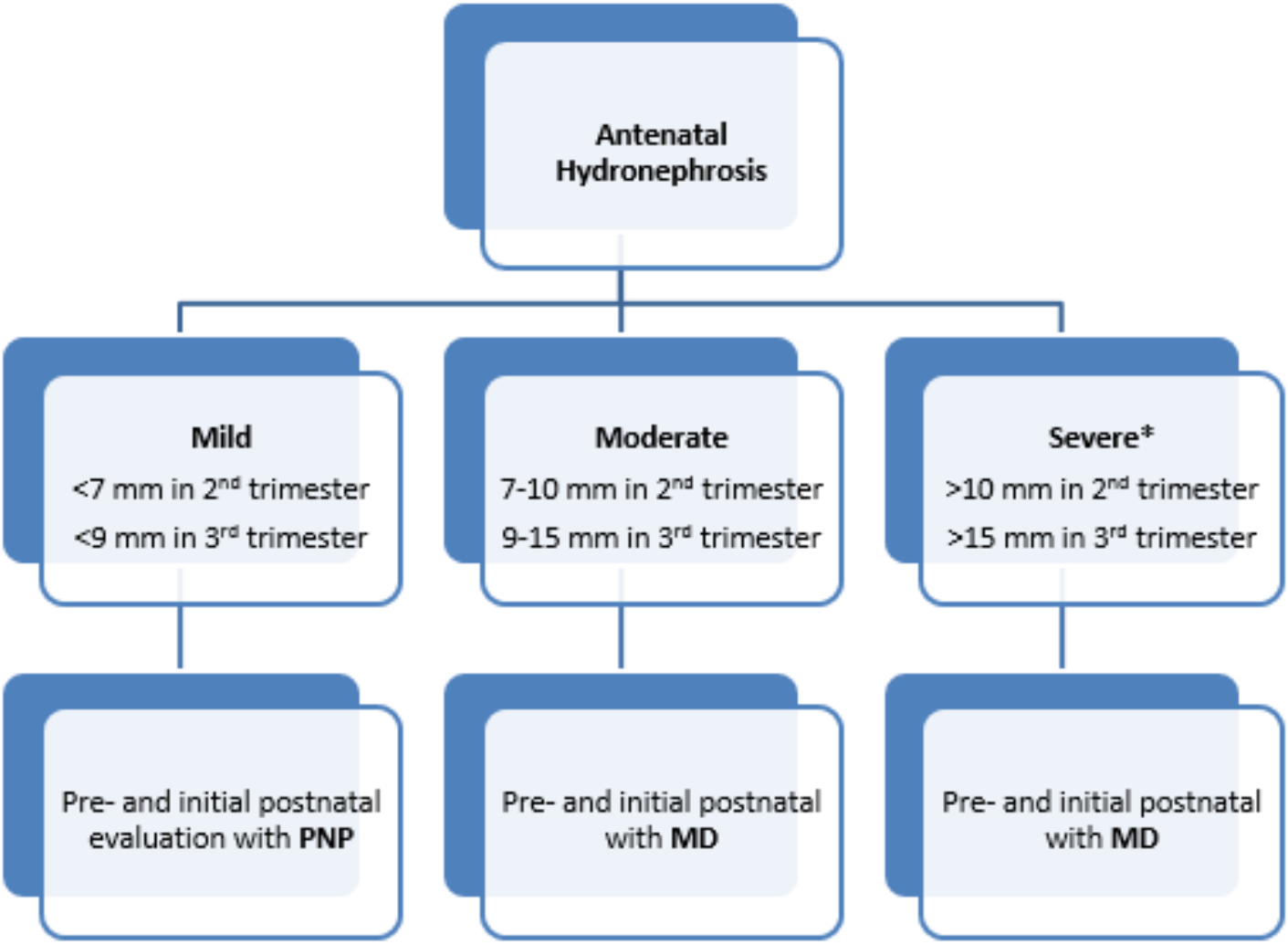
Children's Hospital Colorado

ALGORITHM- Alternative Diagnosis



Hydronephrosis (Prenatal)

- 1% of all pregnancies
- Due to impairment of urine flow or reflux of urine
- Differential
  - Ureteropelvic junction (UPJ) obstruction, vesicoureteral reflux (VUR), ectopic ureter, ureterovesical junction (UVJ) obstruction, ureterocele, transient physiologic hydronephrosis, posterior urethral valves (PUV), multicystic dysplastic kidney (MCDK), polycystic kidney disease (PCKD), megaureter, ureteral stricture, urethral atresia, etc
- The likelihood of significant postnatal pathology correlates to the severity of antenatal hydronephrosis[2]
  - *Fetuses with renal pelvic diameter (RPD) > 15 mm during 3rd trimester are at the greatest risk*



*Special considerations: oligohydramnios, suspected PUV, increased renal echogenicity may require additional imaging, fetal vesicocentesis or shunting, or other fetal intervention

2. Lee RS, Cendron M, Kinnamon DD, Nguyen HT. Antenatal hydronephrosis as a predictor of postnatal outcome: a meta-analysis. Pediatrics 2006;118:586-93.

Hydronephrosis (Postnatal)

- **Obtain renal and bladder ultrasound @ >48-72 hours of life**
  - US earlier than 48-72 hours of life can lead to a false negative result due to the relative oliguria of the newborn period[3-5]
- Bilateral hydronephrosis in a male patient → **obtain VCUG to rule out posterior urethral valves**
- Some recommend prophylactic antibiotics
  - Do not use bactrim in patients <2 months of age secondary to risk of kernicterus
  - If <2 months of age use amoxil 10-20 mg/kg/dose QD

SFU Grading System

*Slight splitting of the central renal complex **w/o calyceal involvement***

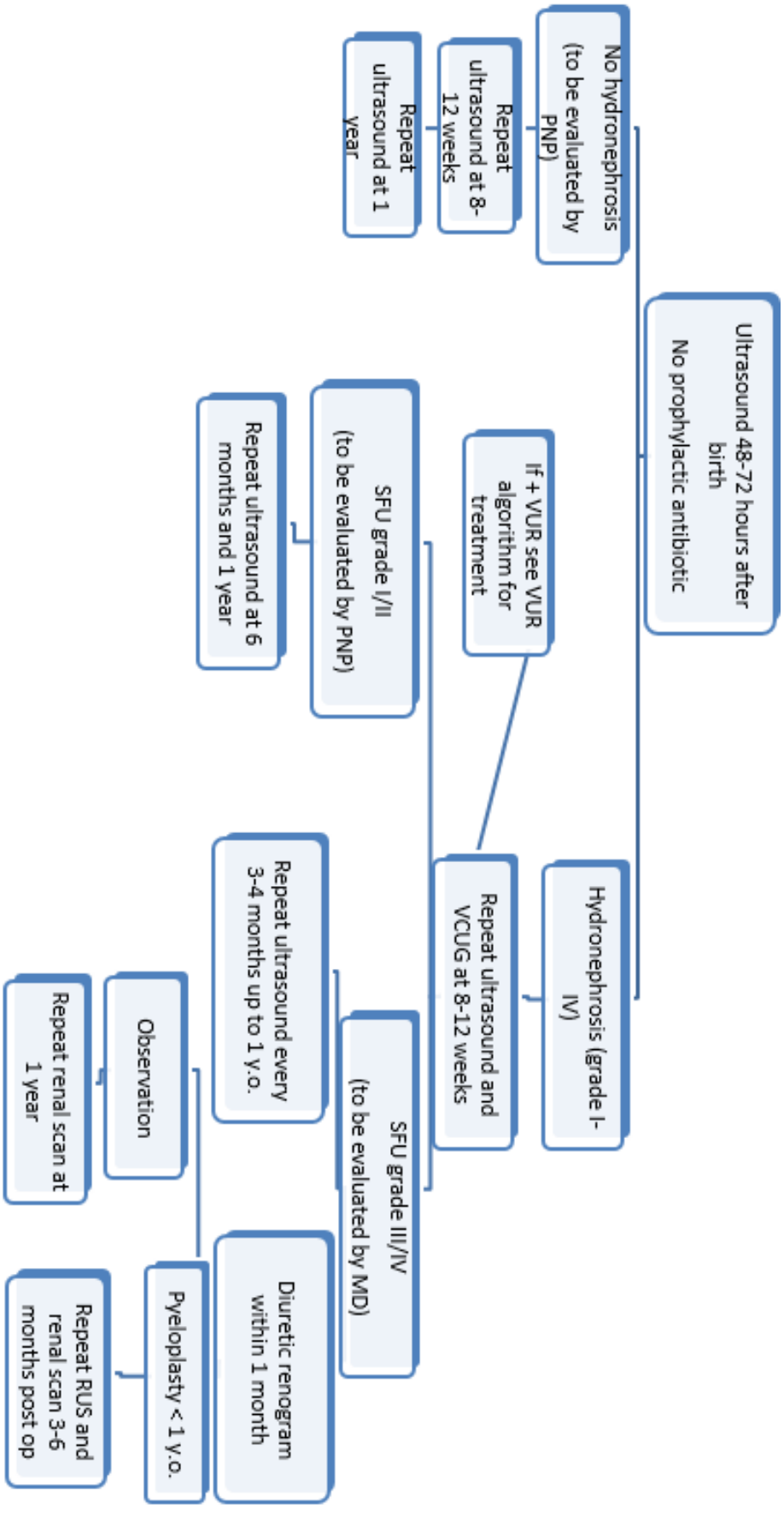
*Splitting of the central renal complex **with extension into a few non-dilated calyces***

*Wide splitting of the renal pelvis, dilated outside the renal border, **calyces uniformly dilated**, normal parenchyma*

*Large, dilated calyces, **thinning of the parenchyma** < or = 50% of the contralateral (normal) kidney*

3. Dhillon H. Imaging and follow up of neonatal hydronephrosis. Current Opinion in Urology 1995;5:75-8.
4. Aksu N, Yavascan O, Kangin M. Postnatal management of infants with antenatally detected hydronephrosis. Pediatr Nephrol 2005;20:1253-9
5. De Bruyn R, Marks SD. Postnatal investigation of fetal renal disease. Semin Fetal Neonatal Med 2008;13:133-41.

Hydronephrosis (Postnatal) (cont.)



Myelomeningocele

- Myelomeningocele protocol:
  - Obtain renal ultrasound
  - Foley catheter x24 hours
  - Begin CIC on POD #2 myelomeningocele closure
    - CIC q6 hours (or BID; goal < 10 cc on PVR)
  - Discharge planning
    - Follow-up in Pediatric Urology Clinic at 2-3 months of age for urodynamic studies (UDS)

Pyelonephritis

- Fever + flank pain + UTI
- Clinical diagnosis (ie do not necessarily need imaging to diagnose)
- If clinically well may treat as outpatient with PO antibiotics
  - Ex: normal or slightly elevated WBC, tolerating PO
- If clinically unwell or fail outpatient management → admit for IV antibiotics
  - Ceftriaxone, gentamicin are reasonable choices
  - Double coverage unnecessary per ID
- May take a few days for fevers to resolve despite appropriate therapy, keep antibiotics broad until cultures result
- If patient does not improve in 2-3 days consider (repeat) imaging

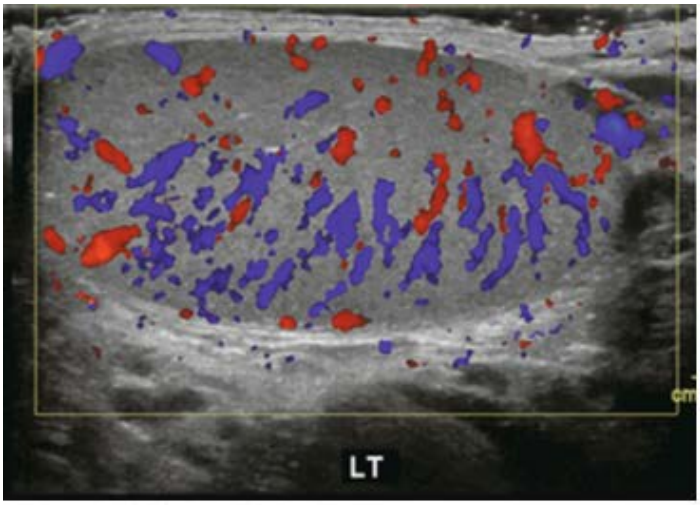
Renal Trauma

GUIDELINES

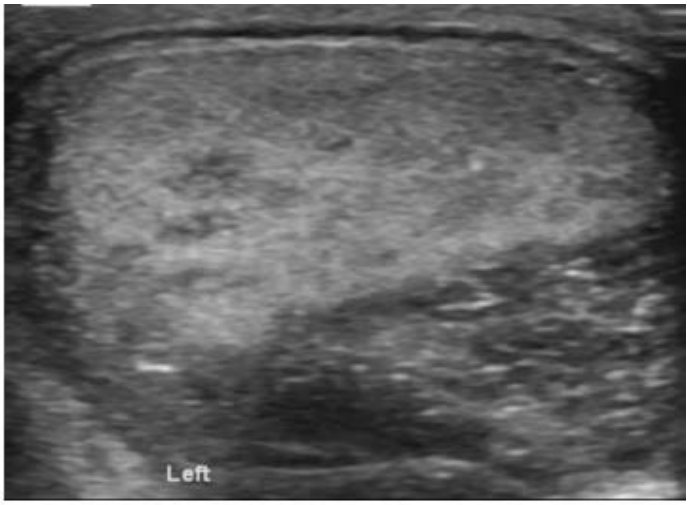
	Grade I & II	Grade III	Grade IV	Grade V
Admit to:	**Floor**	**Floor**	**Floor/ICU (depending on need for monitoring)**	**ICU**
Hospital LOS	23 hour obs/ED	1-2 days	2-3 days	3-4 days
Urology Consult	Not necessary	Not necessary	If urinoma, consult Urology	Please consult Urology
Lab tests	HCT 12hrs post injury	HCT 12 & 24hrs post injury	HCT 12, 24 & 48hrs post injury	HCT 6, 12, 24, & 48hrs post injury
Clinical Assessment & Monitoring	VS q 4 Daily BP Strict I&O	VS q 4 BP q 4 Strict I&O	VS q2 if in PICU x24 hours, then q4 on floor Strict I&O	VS q1x12 hours, then q2 until stable for transfer Strict I&O
Treatments & Procedure	Incentive Spirometry PRN	Incentive Spirometry PRN	Incentive Spirometry until ambulatory, NG as indicated, foley if indicated*	Incentive Spirometry until ambulatory, NG as indicated, foley if indicated*
Nutrition	NPO x12hrs, clears ADAT	NPO x12hrs, clears ADAT	NPO x24hrs if PICU, clears x8hrs, then ADAT	NPO x24hrs, clears x8hrs, then ADAT
Activity	Room based bed rest, bathroom ok	Bed rest until gross hematuria resolved	Bed rest until gross hematuria resolved	Bed rest until gross hematuria resolved
IV Fluids	MIFV while NPO, hep lock with good PO intake	MIFV while NPO, hep lock with good PO intake	MIFV while NPO, hep lock with good PO intake	MIFV while NPO, hep lock with good PO intake
Pre and Post D/C Imaging	None	None	US 2-3d post injury & 6wk post injury**	US 2-3d post injury & 6wk post injury**
Restrictions on Contact Sports ***	Until microscopic hematuria clears, less than 5RBC/hpf***	Until microscopic hematuria clears, less than 5RBC/hpf ***	6 wk & microscopic hematuria cleared ***	6 wk & microscopic hematuria cleared ***
Return to school	1 week or less	1 week	1-2 weeks	1-2 weeks
Follow up clinic visit	Only for concerns	6 weeks with surgery	6 weeks with US**	6 weeks with US**
PCP f/u	Annual BP check	BP at 6wk, 6mo, & yearly, weekly UA until urine clears, less than 5RBC/hpf	BP at 6wk, 6mo, & yearly, weekly UA until urine clears, less than 5RBC/hpf	BP at 6wk, 6mo, & yearly, weekly UA until urine clears, less than 5RBC/hpf

Testicular Torsion

- Acute onset of scrotal pain +/- swelling
- Ddx: epididymitis, torsion of the appendix testis, mumps orchitis, trauma, tumor
- Physical exam: high riding/horizontal lie testicle, absent cremasteric reflex (not always)
- **Time is testicle!**
  - The best chance for testicular salvage occurs if blood flow is restored within 4-8 hours[6]
- Bimodal age distribution
  - Neonates: extravaginal torsion
  - Adolescents: intravaginal torsion (bell clapper deformity)
- If classic history and exam → may proceed to OR without ultrasound
- If patient has intermittent testicular torsion with good flow on current testicular ultrasound, consider referral to clinic for discussion regarding elective orchiopexy



Normal

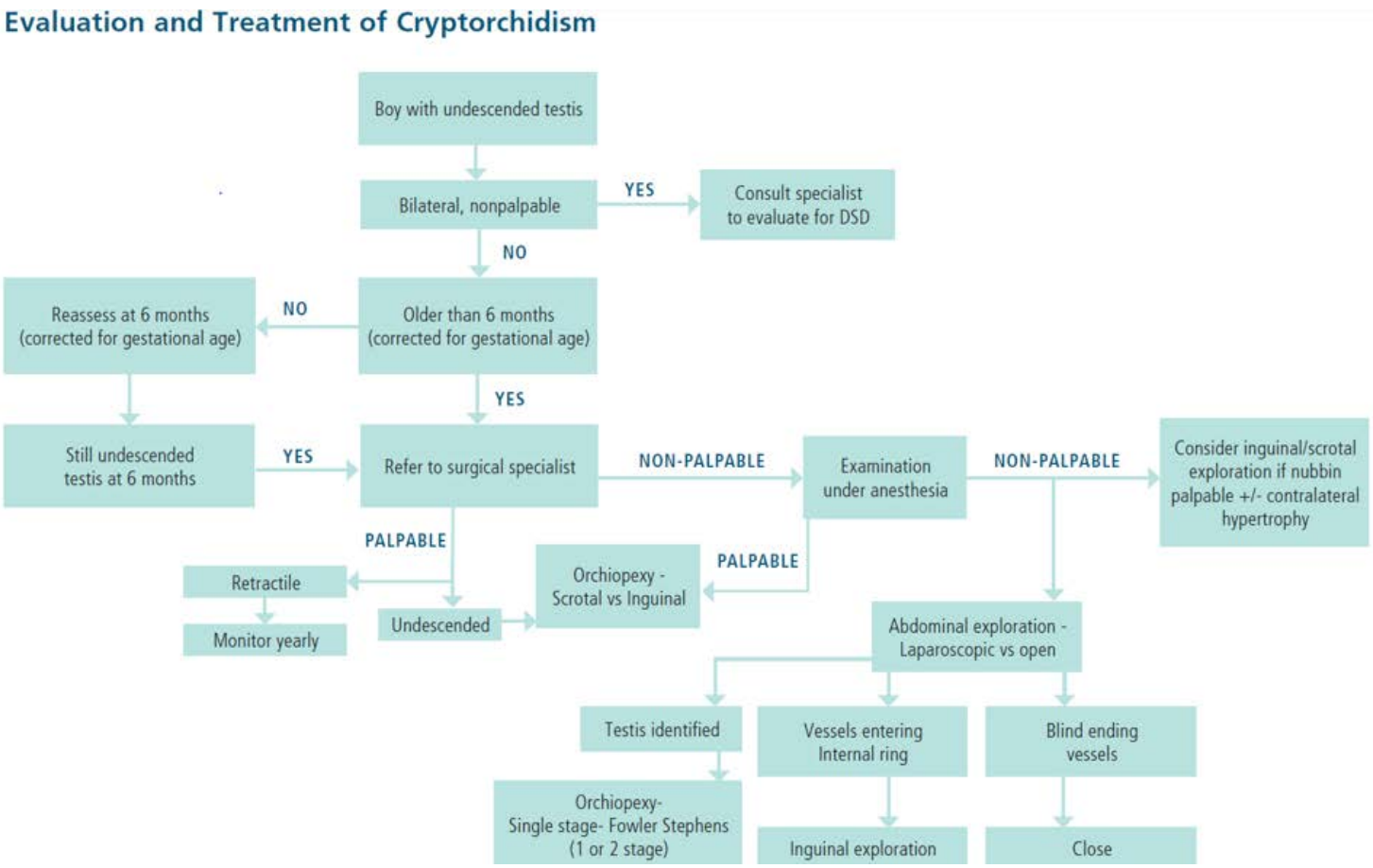


Loss of arterial flow
Parenchymal heterogeneity

6. DaJusta DG, Ganberg CF, Villaneuva C, Baker LA. Contemporary review of testicular torsion: new concepts, emerging technologies and potential therapeutics. J Pediatr Urol. 2013;9:723-30.

Undescended Testicle

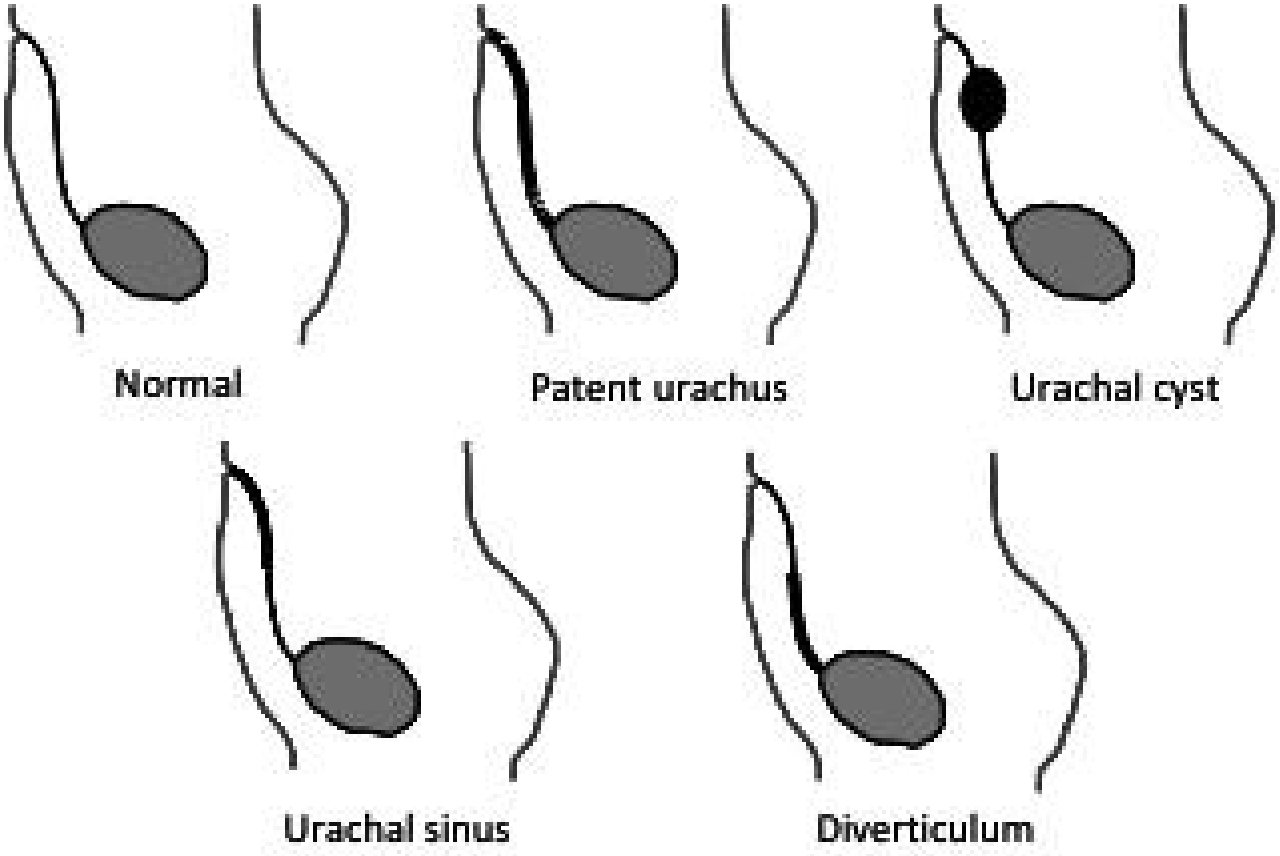
- Absent, undescended, retractile, ectopic
- **Imaging is not needed**
  - Reasons: accuracy, cost, availability, rate of false positives and need for anesthesia
  - Ultrasound to detect nonpalpable testes: sensitivity 45%, specificity 78%
- The most reliable way to evaluate an undescended testicle is physical exam[7]
  - By a pediatric urologist → 84%
  - By a referring physician → 53%
- If patient is <6 months (adjusted gestational age), wait for testes to descend spontaneously
- If testicles do not descend by 6 months (adjusted) → operative intervention
  - Spontaneous descent is rare after 6 months
- Do not give hormonal therapy to induce testicular descent



7. Hrebinko RL, Bellinger MF. The limited role of imaging techniques in managing children with undescended testes. J Urol 1993;150:458

Urachal Anomalies

- Urachus normally closes week 12 of gestation
- Most common symptoms: umbilical drainage or pain/mass from infection
- Patent urachus often closes
- Management
    - Clinic follow up (generally not an emergency)
    - Renal/abdominal US reasonable but not necessary
    - If infected, obtain urine culture +/- wound culture, give broad spectrum antibiotics (skin coverage), usually delayed excision
        - The most common organism with an infected urachal cyst = staph aureus



Urinary Tract Infections

- In children, affects ~5% of girls and ~2.5% of boys
- An estimated 30-40% of children <5 years of age who develop a UTI have VUR upon further evaluation[8]
- Discuss catheterized specimen (unless patient can void)
    - Nitrite positive
        - Results of gram negative bacteria converting nitrate → nitrite
        - Highly specific (90%), less sensitive (35-85%)
    - Leukocyte esterase
        - Produced by neutrophils
        - Can have false negative if have bacteriuria without pyuria

Nitrite negative organisms
Streptococcus (Enterococcus)
Pseudomonas

- Treat UTI per urine culture
    - 7-14 days of treatment
    - Patient with bowel incorporated into GU tract (ie augment, mitrofanoff, monti, etc) will have "dirty" UA → must look at clinical picture
- Renal ultrasound with any UTI (especially in infants)

CLINICAL PRACTICE GUIDELINE

Urinary Tract Infection: Clinical Practice Guideline for the Diagnosis and Management of the Initial UTI in Febrile Infants and Children 2 to 24 Months

Action Statement 5

Febrile infants with UTIs should undergo renal and bladder ultrasonography (RBUS) (evidence quality: C; recommendation).

Action Statement 6a

VCUG should not be performed routinely after the first febrile UTI; VCUG is indicated if RBUS reveals hydronephrosis, scarring, or other findings that would suggest either high-grade VUR or obstructive uropathy, as well as in other atypical or complex clinical circumstances (evidence quality B; recommendation).

Action Statement 6b

Further evaluation should be conducted if there is a recurrence of febrile UTI (evidence quality: X; recommendation).

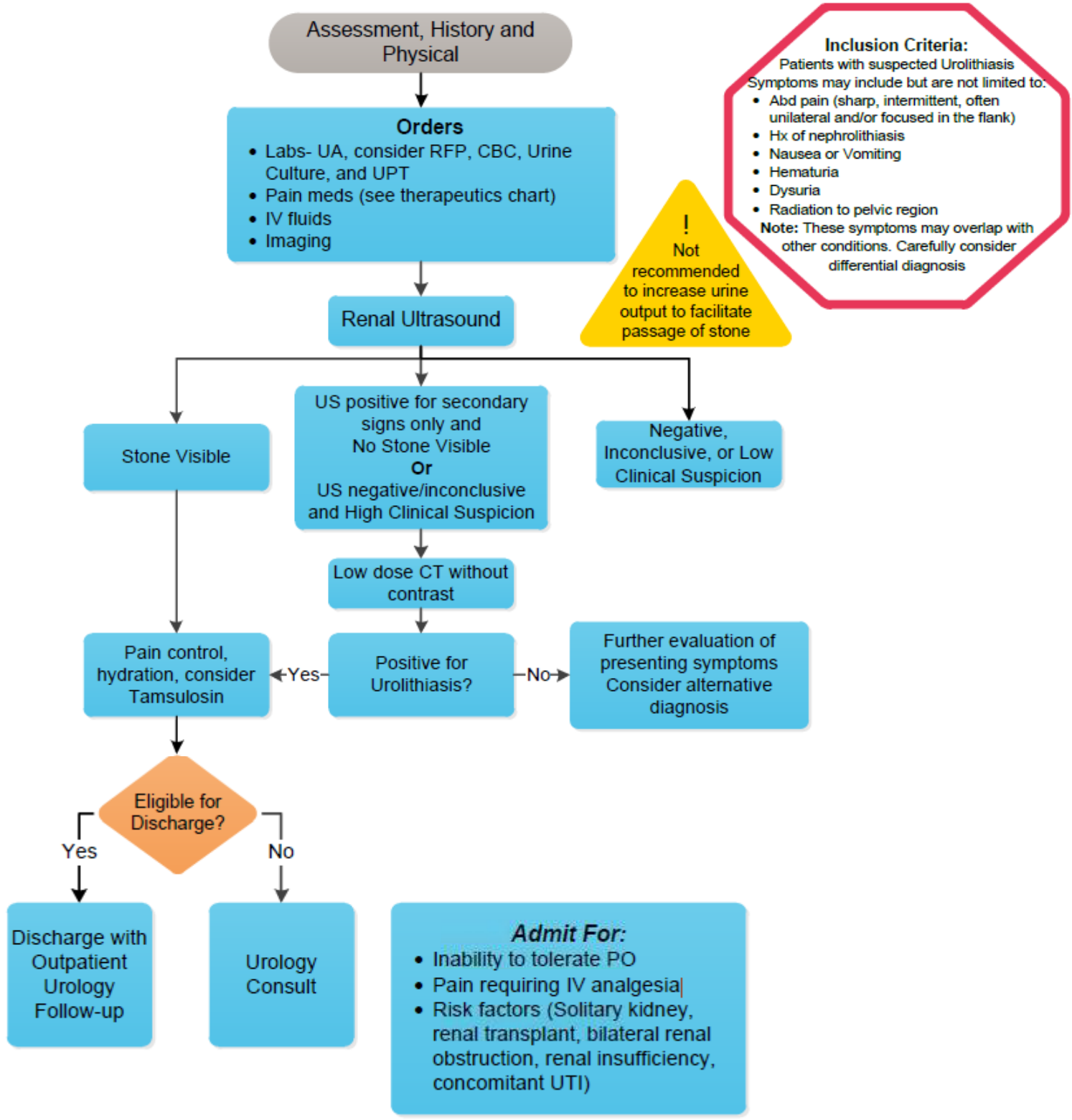
8. Baker R, Maxted W, Maylath J, Shuman I. Relation of age, sex, and infection to reflux: data indicating high spontaneous cure rate in pediatric patients. J Urol 1966;95:27-32.

Urolithiasis

- Pediatric stones are often associated with a metabolic abnormality or GU structural issue
- Obtain family history
- Initial imaging study is usually a renal ultrasound +/- KUB
    - Call attending prior to obtaining a CT scan
- Ureteral stones <4mm may be passable with medical expulsive therapy (MET) with Flomax
    - If MET, refer to Dr. Campbell's clinic (~2 weeks)
        - If family lives south may consider referral to Dr. Caldwell's clinic
- Please see protocol on next page

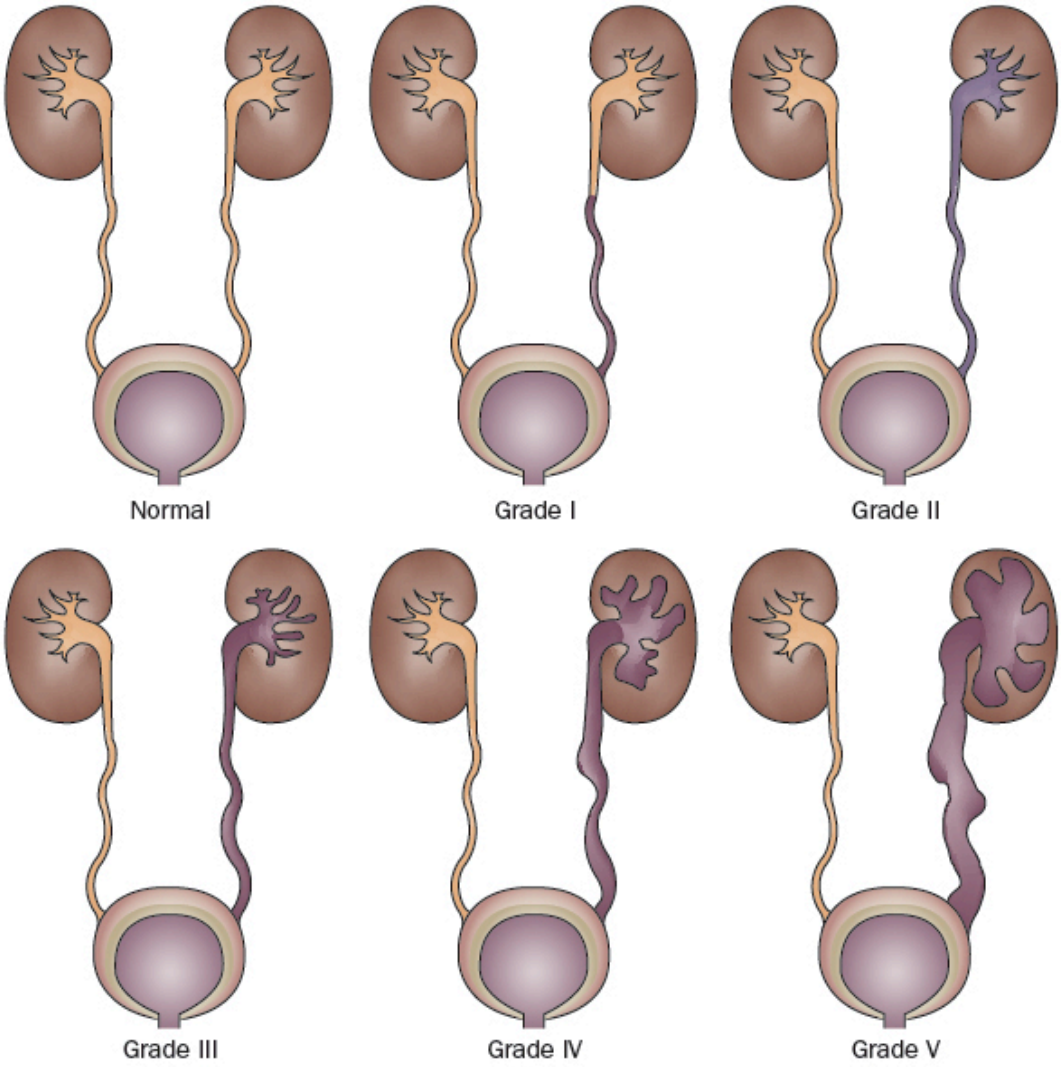
UROLITHIASIS

ALGORITHM



Vesicoureteral Reflux (VUR)

- Can lead to UTIs, pyelonephritis, renal insufficiency, hypertension
- If acute urinary tract infection/pyelonephritis
  - Catheterized specimen v.s. clean catch → urine culture
- Treat based on culture, then likely resume prophylactic antibiotic (if applicable)
  - Common prophylactic antibiotics: bactrim, macrobid, amoxicillin, keflex
- Ensure dysfunctional voiding is maximally treated
  - Referral to an Advanced Practice Provider (APP) for treatment of dysfunctional voiding
- Gold standard to diagnose VUR = VCUG
  - Urine should be sterile prior to obtaining VCUG (ie do not obtain VCUG immediately after febrile UTI that has not been treated)



J Pediatr. 2014 May;164(5):1171-1174.e1. doi: 10.1016/j.jpeds.2014.01.013. Epub 2014 Feb 15.

Discovery of hypospadias during newborn circumcision should not preclude completion of the procedure.

Chalmers D[1], Wiedel CA[1], Siparsky GL[1], Campbell JB[1], Wilcox DT[1].

- If intact prepuce → newborn circumcision may be safely completed
  - Did not affect surgical repair or increase complication rates
  - Aborting a newborn circumcision after dorsal slit will expose a substantial number of children to additional procedures under general anesthesia that could be avoided
- If incomplete prepuce/chordee/hypospadias proximal to glans/torsion/PS webbing → do not perform (or abort) circumcision
  - Referral to Pediatric Urology clinic before 6 weeks of age

9. Snodgrass W.T., and Khavari R. Prior circumcision does not complicate repair of hypospadias with an intact prepuce. J Urol 2006; 176:296-298
10. Pieretti R.V., Pieretti A., and Pieretti-Vanmarcke R. Circumcised hypospadias. Pediatr Surg Int 2009;25:53-55

GENERAL UROLOGIC INFORMATION
On-Call Issues and Consults

ON-CALL ISSUES

A-Fib - Cardiology Consult 21942

To Control Rate:

- Metoprolol can be given on regular floor, 5mg IV push over 1 minute every 5 minutes. Must escalate care if not controlled after 3 pushes.

To convert:

- Call MET if hemodynamically unstable or symptomatic
- Procainamide 1000 mg bolus then 2 mg/min
- Amiodarone 150 mg bolus over 10 min then 1 mg/hr x 6 hr then 0.5 mg/hr

Agitation

- Assess situation to distinguish upset patient vs. organic/somatic problem
- Discontinue anticholinergics and minimize narcotics, particularly in elderly patients
- Check blood glucose, electrolytes, check for UTI or other infection
- Ativan 0.5 - 1 mg IV x 1 or q 8 hrs (use cautiously as can sometimes have paradoxical effect)
- Haldol 1-4 mg IV x 1 or q 6 hr (second line)
- Check with patient and family about psychiatric hx and hx of EtOH/illicit drug use
- Avoid physical restraints unless absolutely critical for patient or staff safety, these are likely to escalate agitation

Arrhythmia

- 12 lead EKG now and repeat in 6 hours, then qAM
- r/o fluid overload—CXR/exam (consider Lasix and hold IVF)
- check electrolytes (Ca, P, Mg, K) and replete
- CBC—anemia, postop bleeding
- ABG
- Transfer/start telemetry
- cardiac enzymes (CKMB and Troponin) q8 x 3

Bladder Spasm

- Ditropan 5 mg po tid prn
- B&O suppository q 6-8 h prn (check
- Diazepam 2-5mg po or IV prn
- Heat pad works for some patients

Leaking around Foley or SPT (usually secondary to bladder spasms)

- Control bladder spasms (see above)

If leaking persistent:

- Ensure foley not kinked/obstructed with clot or mucus, ensure foley bag below level of bladder
- Ensure foley balloon in bladder and not urethra/prostate
- Foley drainage can be positional, ensure patient is turned and/or mobilized
- Placing a larger catheter generally not helpful

Blood Products

PRBC

In general, transfuse 1 - 2 units PRBC over 1.5-2 hours each if

1. Symptomatic anemia
2. Acute hemorrhage
3. Hgb < 7
4. Hgb < 10 and cardiac history
5. Indication for autologous transfusion is no different
   ** Alert attending prior to transfusion. Blood consent needed if not still covered by surgical consent. If concerned about CHF may give lasix 10-20 mg IV after each unit. Always go see pt, check vitals, and check urine output. Recheck post transfusion H/H.

Platelets

In general platelet count should be kept above 50K. Platelets are given in 6 packs (one pool = 6 units). Rate: can be infused as quickly as patient can tolerate (can push or give slower). Before giving platelets, determine the source of thrombocytopenia; remember giving platelets in cases such as ITP is useless.

FFP

Indicated for rapid treatment of the bleeding patient with a coagulation defect caused by liver disease, coumadin therapy, antithrombin III deficiency, TTP, DIC or massive RBC transfusion. Can push FFP or give slower.

Chest Pain

Always see the patient, review the chart and take a quick history. Check vitals and pulse ox

- STAT 12-lead EKG- don't forget to f/u on it once done STAT Cardiac enzymes q 8 hrs x 3
- Consider STAT ABG and CXR
- Repeat 12-lead EKG in AM
- If suspect PE:
  - CT PE protocol if stable
  - MET/transfer if unstable
- If suspect ischemia or infarct give:
  - Oxygen
  - Nitroglycerin 0.4 mg SL q5min x 3 prn
  - Nitro paste 1 - 2" to ACW q 8 hours
  - Consider starting B-blocker (lopressor 10 mg iv q 8 hrs)
  - STAT cards vs. medicine consult

Constipation (Laxatives)
- Colace 100 mg po bid
- Miralax 17g po bid
- Dulcolax suppository pr x 1 Fleets vs. mineral oil enema x 1
- Senna is a stimulant laxative, it induces large intestine smooth muscle contraction; do not give to patients with ileus or obstruction!
- Prune juice, MOM 30 cc po bid (contraindicated if renal insufficiency)
- Consider urinary retention as patients will feel this sometimes as constipation

CT Scans
For contrast allergy
- Prednisone 50 mg PO x3: 13 hrs, 7 hours, and 1 hr before CT
- Benadryl 50 mg PO 1 hr before CT

For prevention of contrast-mediated renotoxicity
- Mucomyst 600 mg PO BID x 4 days beginning day before CT (per Tepel et al. NEJM 2000 Jul 20;343(3):180-4)
- Hydration (if pt an inpatient, run IVF overnight, if an outpatient, pt can receive IVF over 4 hrs in CT area… CT scan should be scheduled for noon.)
- If patient on Glucophage (metformin), hold dose for that day and for 48 hours.

DT Prophylaxis
Order set in epic
- Ativan 1-2 mg iv q 6 - 8 hours
- B12 100-200 mcg IM x 1 q month Folate 1 mg iv qd
- Thiamine 100 mg iv qd
- Vit K 10 mg SQ qd x 3 days

DVT prophylaxis
- SCDs: all patients
- SCDs work by release of endothelial factors into bloodstream, therefore patients with unilateral leg sores or only one leg can still fully benefit
- Heparin 5,000 units s.q. bid or tid – start on post-surgical patients with attending approval. Start on all new admits without any particular concern for acute hemorrhage.
- Lovenox (low-MW-heparin) 40 mg sq daily
- History of HIT: consult medicine, consider rivaroxaban or other direct Xa/thrombin inhibitor

Diarrhea
Infectious
If you suspect infectious cause of diarrhea, consider checking stool for fecal WBCs, culture, C.Diff toxin x 3, O&P
- Uncomplicated C. Diff Rx - Flagyl 500 mg po tid x 10 days

Non-infectious

1. Metamucil (psyllium) 1 tbsp po tid
2. Kaopectate 2 tbsp prn loose bm
3. Imodium (loperamide) 2-4 mg po qid (30 min before meals and qhs)
4. Lomotil (diphenoxylate 2.5 mg + atropine 0.025 mg per tab or 5 ml) 2 tabs or 10 ml po qid (30 min before meals and bedtime). Quantity to prescribe is 300 ml

Both infectious and non-infectious

Monitor for fluid and electrolyte losses – diarrhea will generally cause hypovolemia, hypokalemia, and acidosis

Electrolytes

Hyponatremia

- Hypovolemic—Change fluid to NS, IV meds with NS
- Normovolemic—No free H20, 1500cc fluid restriction
- Hypervolemic—1500cc fluid restriction, loop diuretics
- Check serum and urine osmolality, urine specific gravity and electrolytes
- Consider SIADH
- Consider salt tabs 2 grams po bid vs. encourage po intake of salty food
- Recheck electrolytes frequently—consider nephrology consult if not improving

Hypernatremia

- Change to 1/4 NS
- Consider DI (rx with DDAVP (desmopressin) 0.05 mg po bid)
- Check serum and urine osmolality
- Check urine specific gravity and urine electrolytes

Hypokalemia

- 10-20 mEq KCl in 100 cc NS over 1 hour, may repeat x 1
- Oral potassium is much better tolerated (IV potassium is painful, especially through a peripheral IV) and has good bioavailability. Supplement with potassium powder or tabs if possible.
- Recheck K if originally <3.0
- Check Cr (cautious repletion if significant renal insufficiency)
- Can add 10 mg of lidocaine to 250 cc NS bag to decrease burning

***Remember: check a magnesium level if the patient is persistently hypokalemic and correct as needed.*

Hyperkalemia

- Kayexalate 30 gm po/pr (Do not give per rectum to transplant patients because of risk of colonic perforation)
- NaBicarb 150mg IV x1
- Calcium Gluconate 1 amp in 100 cc NS IV over 1 hr (stabilizes myocardial cell membrane)
- Insulin 10 units regular IV + 1 amp (25G) D50 (transient effect)

- Check EKG/tele—ensure no peaked T waves or other EKG changes
- Recheck K and glucose 30-60 minutes after administration

Hypocalcemia (4-albumin) x 0.8 + Calcium
- Calcium Gluconate 1 amp in 100 cc dextrose iv over 1 hr Oscal/Tums 500-1500 mg po

Hypercalcemia
- IVF/Lasix/Pamidronate

Hypomagnesemia
- MgOx po 400mg daily, be aware this also acts as mild laxative
- Mg Sulfate 1 gram iv in 100 cc NS over 1 hr

Hypophosphatemia
- K-Phos 12- 15 mmol in 250 cc NS over 3 hours—not in renal insufficiency Na-Phos 30 mmol iv x 1

Fever

POD # 1 -3:
- most likely atelectasis
- Treat with IS x 10/hr, ambulation, optimize pain control, if severe may need CPAP. Can give Tylenol.
- High fever: Make sure to check the incision for signs of necrotizing infection

POD # 3 or greater
- most likely infection, consider intra -abdominal abscess, DVT, wound infection or line infection
- Pan culture (urine, blood, sputum if symptomatic) CBC
- CXR - PA & LAT
- Check peripheral IV sites and LE/UE exam for DVT

*** *Any immunocompromised patient (such as a transplant patient) needs to be worked up aggressively.*

Hiccups

Thorazine 10 mg PO/IV(repeat q8hrs prn) – caution, can cause hypotension

Hypotension
- Most episodes of post-op low blood pressure are due to fluid depletion or epidural. If epidural is suspected, call APS.
- Always consider MI, sepsis or bleeding.
- Determine fluid status, if dry, treat with fluid or may even need hespan or albumin.

Hypertension
- Labetolol 10 - 20 mg iv q 1 hr prn SBP > 180
- Hydralazine 10 - 20 mg iv q 2 hr prn SBP > 180

- Clonidine 0.1 - 0.2 mg SL/PO
- Metoprolol (Lopressor) 10mg IV q4 hours PRN SBP >180
- Nitroprusside 1-2 in. to ant chest wall q8-12 hr prn (can wipe off if hypotension).

Mental Status Change

See the patient - check vitals and pulse ox, consider ABG and electrolytes.

- Commonly post-op patients become drowsy or stupor from narcotic overdose - look for respiratory depression and pin-point pupils.
- Treat opioid overdose by turning off PCA and with narcan 0.2 mg IV push over 2-3 minutes.
- Always call pain management before giving narcan.
- Note: narcan is short-acting, may have to be re-dosed

3 H's = Hypotension / Hypoxia / Hypoglycemia

Mitomycin C

Only if no evidence of bladder perforation.

- 40mg in 40cc H20
- Instill via Foley into bladder, clamp catheter, remove fluid after 1h
- Wear gloves.
- Dispose of equipment (foley, foley bag, etc) into the appropriate chemotherapy disposal containers. (ask nursing to obtain).
- If spills on patient (eg tubing comes off or bladder spasm), clean immediately with copious fluid to dilute off skin.

Nausea and Vomiting

- Reassess etiology if on 2+anti-emetic meds (eg ileus)
- Zofran 4 mg IV q 6 hrs prn
- Phenergan 12.5 mg IV q8 hrs prn
- Reglan 10 mg IV QID
- Compazine 10 mg IM q 6 hrs prn

PUD prophylaxis

- Continue home med.
- Pepcid (H2 blocker) 20 mg po/iv q 12 hrs
- Protonix (PPI) PO 20-40mg q 24 hours
- Carafate 1 gm po QID
- Maalox 30 cc per NG/po q 6 h

Shortness of Breath

- Always see the patient, review the chart, and take a quick history.
- Check vitals and pulse ox (check different finger, ear)
- Listen for wheezing, etc
- Check UE/LE exam for DVT
- Kidney surgery? Think about PTX.
- STAT ABG, EKG, CXR, cardiac enzymes.

- Respiratory therapy consult for breathing treatments.

Steroids
- Stress dose pre-op: hydrocortisone 100 mg iv pre-op. Taper: Hydrocort 50 mg IV q8h x48h; then Hydrocort 100 mg IV x24h, then Pred 25 mg PO daily (depends on pt's prior history)
- Suspect adrenal insufficiency in pts with hx of steroid use and muscle weakness, lethargy, hypoglycemia, ABDOMINAL PAIN, hypotension postoperatively. Examples include pts with hx of prior autoimmune disease, RA, OA, gout, etc)
- Spinal cord compression: Decadron 4 mg iv/po q 6 hrs x 48 hours (Don't forget accuchecks t.i.d and pepcid 20 mg iv q 12 hrs)

Urine Output
***** Anuria is not the same as oliguria *****
Anuric patients, especially post-op, require immediate attention—consider intraoperative complications due to nature of surgery, consider stat US with Doppler

Low UOP
- Rule out clot retention, make sure foley is draining well
- Check drain output—increasing? Consider checking JP Cr and urine leak
- Post-op pts 3rd space fluid for first couple of days and don't mobilize until POD # 3.
  - Before giving fluid check patients age and cardiac history (see if old EF in system)
  - Fluid should be given very cautiously and slowly to the elderly and patients with cardiac history (250cc/2 hours)
  - Consider getting a renal US with dopplers to evaluate blood flow.
  - 500 cc NS over 1 hour (may repeat if necessary) - after 1000 - 1500 cc of crystalloid consider colloid solution

***Before giving Lasix always examine the patient and determine fluid status. The best way to determine fluid status is by physical exam and daily weights. Also consider CVP if unsure in ICU.*

COMMON UROLOGIC CONSULTS

Acute Urinary Retention/BPH
- History: Post-op (type of surgery), POD#, ambulating?, pre-op voiding sx and or medications?
- Discuss options: place foley and leave for x days vs intermittent straight cath, f/u as outpt
- If pre-op LUTS, can start on alpha-blocker
- Follow-up: with local urologist vs. any GUKI staff

Difficult Catheter Placement

- Ask age and gender:
  - Young man
    - think urethral stricture
    - ask current voiding sx
    - may need small catheter (10-12Fr)
    - If unable to pass small cath, may need flex cysto, guidewire/dilators, or SPT if significant stricture
  - Old man
    - generally BPH
    - bring 18-20 Fr coude
    - UROJET is your friend
  - Woman
    - usually related to locating the meatus due to habitus
    - ask primary service to assist with retraction
    - ensure female chaperone if necessary
- Obese patient / buried penis / scrotal edema
  - Pour betadine into cavity and palpate for meatus; or
  - Could use speculum to open cavity and use catheter guide to place foley into meatus and then withdraw catheter guide.
- Ask what catheters attempted and how far they go in
  - If not in at all, meatal stenosis vs. phimosis
  - If stops after a few inches
    - (bulbar) urethral stricture
  - If most of the way
    - BPH or bladder neck contracture
    - ask about h/o prostatectomy, TUPR, PVP before seeing pt
  - If all the way in
    - is it in bladder? (irrigate),
    - BPH and curling back
    - false passage

Catheters in Children

<2 yrs	5-8F
2-7 yrs	10F
>7 yrs	12F

Can't Remove Foley

If had stents placed, consider whether the sutures have occluded the balloon port. Silicone catheters often hang up at the meatus. See the patient: If in a lot of pain and foley not draining, likely out of bladder.

1. Feel for balloon along urethra.
2. Put a little water in balloon, then try to deflate.
3. Cut foley at syringe site.
4. Get guidewire, lube, two instrument sets.
5. Cut foley along main tube and grab with hemostat. Feed lubed wire up balloon port (not easy).

6. Ultrasound-guided balloon puncture. If the first few fail, call chief / staff when you feel you need help.

Hematuria

- Ask color of urine, presence of clots, and evidence of retention.
- For refractory hematuria, bring the "call stopper" (24 Fr couvelaire 3-way catheter do not use on Angermeier patients), 3 L bags of saline, CBI tubing, large bag, Urojet.
- History: GU surgery, bladder cancer, stones, indwelling/new foley (# attempts), anticoag, dysuria, radiation, chemo (cyclophosphamide), medical renal dz
  - If clot retention: place foley, irrigate
  - If traumatic: use bigger catheter, overfill balloon, traction, irrigate
  - If "crazy foley-puller" consider taping below leg and placing sham foley on abdomen.
  - If over anti-coagulated; ask primary to correct, although not at the risk of other problems, as hematuria is almost never life-threatening

We also need to evaluate these patients for a urologic source.
All patients need:

1. UA
2. Urine C&S
3. Urine cytology.

Most patients deserve upper and lower tract imaging: CT urogram and cysto in office as outpt.

Hydronephrosis in newborn diagnosed on prenatal US

- UPJ, reflux, megaureter, duplication, ectopic ureter/ureterocele
- US on 1st day of life usually underestimates degree of hydro
- Renal/bladder US and Amoxicillin 10 mg/kg/day before leaving nursery
- Recommend postnatal eval within 1st month (VCUG+US)
- For bilateral hydro, worry about post urethral valves (consider in newborn with distended bladder and failure to void) -VCUG right away and LEAVE catheter in

Incontinence

Just rule out overflow with PVR. Follow-up as outpt.

Priapism

- Penile blood gas to confirm ischemic.
- Ask for monitor (pulse ox, BP, tele), phenylepherine, 3 20cc syringes, butterfly needles, ABG kit, 3-way stop-cock, sterile injectable saline (not the large bottles for irrigating) to be at the bedside when you arrive.
- Consider penile block
- Aspirate corpora with 21-gauge butterfly followed by injecting 250-500mcg phenylephrine q5min (0.5 – 1 cc of mixture of 10 mg/mL phenylephrine (1 cc) **with 19 cc NS). Go slow and monitor BP and HR while injecting.**
- Sickle cell: ensure IV hydration and place pt on oxygen

FEMALE PELVIC RECONSTRUCTION

General

- Dr. Oliver preferences for pts having any vaginal surgery:
  - No sq heparin or lovenox (if pt on ASA or anticoagulated at baseline, d/w Dr. Oliver post op plan)
  - No toradol until UOP > 100 cc and pt doing well in PACU
  - If no concurrent abdominal procedure planned, we will often use candy canes
- Dr. Oliver discharge planning
  - Check EPIC encounters to see if a follow-up appt is scheduled. If not, discuss follow-up plans with Dr. Oliver and arrange this prior to discharge.
  - All pts should get an rx for pain meds (oxycodone, etc) and miralax. Do not send pt's home without pain meds unless we've discussed.
  - Catheters should be secured w/ stat locks (not leg straps)
  - All pts' discharge instructions should include the following:
    - Take Tylenol and ibuprofen q 6hrs around the clock on an alternating schedule for the first 48 hrs (ie. Tylenol 650 mg at 6 am, Ibuprofen 600 mg at 9 am, Tylenol 650 mg at noon, Ibuprofen 600 mg at 3 pm, etc.). Take oxycodone for breakthrough pain. Do not drive while taking narcotics.
    - If you have a dressing on your incision, this may be removed in 2 days.
    - If you have steristrips on your incisions, these will fall off on their own most likely, but if they haven't fallen off in 10-14 days, then you may remove them.
    - You may start showering at POD#2.
    - No heavy lifting x 6 weeks.
    - Nothing per vagina x 6 weeks (EXCEPTION: longer for fistula pts! See below)
    - Make sure discharge instructions include clinic phone number and how to reach the resident on call: Patients should be instructed to call or go to ER for temperature > 101 F, foul smelling vaginal discharge, vaginal bleeding >1 pad/hr x 2hrs, abdominal pain refractory to pain meds, wound separation or drainage, and any other concerning sx

Cystocele/rectocele repair

Pre-op:

- Ancef 2 g IV
- If PCN allergic: Clindamycin 600 mg + Gentamicin 80 IV, or Flagyl 500 mg IV + Gentamicin 80 mg IV

FEMALE PELVIC RECONSTRUCTION (Continued)

Discharge:

- Native Tissue/Outpatient
  - D/C vaginal packing in PACU, voiding trial in PACU
  - Anticipate D/C home same day (as long as no apical repair)

  F/u:
  - 3 wks
- Complicated/Overnight
  - D/c vaginal packing 6 am POD#1
  - JO: if fascia lata cystocele repair, catheter x 1 week
- F/u: 1 wk

Scripts: Tylenol, Ibuprofen, Oxycodone, Colace, Miralax, Antibiotic prophylaxis if going home with catheter (Bactrim SS or nitrofurantoin ppx based on allergies, age, and renal fxn, for duration of catheter)

Mesh Sling

Pre-op:

- Ancef 2 g IV
- If PCN allergic: Clindamycin 600 mg and Gentamicin 80 IV, or Flagyl 500 mg IV and Gentamicin 80 mg IV

Discharge:

- D/C vag pack in PACU,
- Voiding trial in PACU,
- d/c home same day;
- No heavy lifting x 6 weeks
- Nothing per vagina x 6 weeks

F/u:

- 3 weeks
- If fails void trial or pt w/ retention, place foley and pt should RTC in 1 wk for void trial
- Scripts: Tylenol, Ibuprofen, Oxycodone, Colace, Miralax

Autologous Fascia Sling

Pre-op:

- Ancef 2 g IV
- If PCN allergic: Clindamycin 600 mg and Gentamicin 80 IV, or Flagyl 500 mg IV and Gentamicin 80 mg IV

Post-op:

- CBC, BMP POD#1 and qAM if stays
- D/c vaginal packing at 6 am POD #1
- Foley or SPC will stay
- D/c coban on leg at 6 am (fascia lata sling)
- No heavy lifting (>10 lbs) x 6 wks
- Nothing per vagina x 6 weeks

FEMALE PELVIC RECONSTRUCTION (Continued)

F/u:

JO: 1 wk, then 4 wks

- BF: 2 weeks

Scripts:

- Tylenol, Ibuprofen, Oxycodone, Colace, Miralax

Interstim Stage I

Pre-op:

- Vancomycin 1 g IV
- If PCN allergic: Clindamycin 600 mg and Gentamicin 80 IV, or Flagyl 500 mg IV and Gentamicin 80 mg IV

Discharge:

- D/C home same day
- No heavy lifting
- No bathing
- Leave tegaderm in place

F/u:

- f/u Appt in 3-5 days to assess response. Will have Stg II scheduled 1-2 wks later

Scripts:

- Oxycodone, Colace, Bactrim DS BID x 5 days.
- If sulfa allergic, Clindamycin 300 mg TID x 5 days.

Interstim Stage II, one-stage Interstim, or revisions where IPG is handled)

Pre-op:

- Vancomycin 1 g IV AND Gentamicin 80 mg IV

Discharge:

- D/C home same day; No heavy lifting for 2 weeks after stage II

F/u:

- 4th Friday of the month (when Doug Zwiers Medtronic rep in clinic)

Scripts:

- Oxycodone, Colace, Bactrim DS BID x 5 days.
- If sulfa allergic, Clindamycin 300 mg TID x 5 days.

Vaginal apical repair (uterosacral, sacrospinus, etc.)

Pre-op:

- Ancef 2 g IV
- If PCN allergic: Clindamycin 600 mg and Gentamicin 80 IV, or Flagyl 500 mg IV and Gentamicin 80 mg IV

Post-op:

- No routine labs.

D/C

- d/c vag pak and Foley (if no concurrent sling, etc) at 6 am POD #1
- Anticipate D/C POD #1
- No heavy lifting, nothing per vagina for 6 weeks.

F/u: - 3 wks

FEMALE PELVIC RECONSTRUCTION (Continued)

Scripts:
- Tylenol, Ibuprofen, Oxycodone, Colace, Miralax

Lap or Open abdominal sacrocolpopexy

Pre-op:
- Ancef 2 g IV and Gentamicin 80 IV
- If PCN allergic: Clindamycin 600 mg and Gentamicin 80 IV, or Flagyl 500 mg IV and Gentamicin 80 mg IV

Post-op:
- CBC, BMP POD#1 and qAM if stays
- D/c vaginal packing (typically only placed if AP repair done) and Foley at 6 am POD #1 (EXCEPTION: if pt had concurrent vaginal procedure – check with attending re: foley plan)
- No heavy lifting (>10 lbs) x 6 wks
- Nothing per vagina x 6 weeks

F/u:
- JO: 1 week, then 4-6 weeks
- BF: 4 wks

Scripts:
- Tylenol, Ibuprofen, Oxycodone, Colace, Miralax

Vesicovaginal fistula repair, Urethrovaginal fistula repair, Urethral diverticulectomy, or removal of mesh from urethra or bladder

Pre-op:
- Ancef 2 g IV + Gentamicin 80 IV
- If PCN allergic: Clindamycin 600 mg and Gentamicin 80 IV, or Flagyl 500 mg IV and Gentamicin 80 mg IV

Post op:
- No routine labs.
- Typically will have SPC

D/C
- vag pak in AM
- Anticipate D/C home POD#1.
- No heavy lifting x 6 weeks
- No sexual intercourse x 3 months (not until cleared by surgeon)

F/u:
- JO: Appts at 1 wk and 3 wks
  - VVF/UVF/Mesh: SPC and Foley x 3 weeks, cystogram at 3 weeks just prior to appt
  - Urethral tic: Foley x 3 weeks, w/ VCUG at 3 weeks just prior to appt
- BF: Appt at 2 wks for foley removal, then 4 wks for SPC removal, w/ VCUG prior to appt at 4 wks

Scripts:
- Oxycodone, Colace, Miralax, Anticholinergics scheduled, Antibiotic (JO only)
- JO: Bactrim SS or nitrofurantoin ppx based on allergies and renal fxn for duration of catheter

FEMALE PELVIC RECONSTRUCTION (Continued)

Botox
- Preop: PO Cipro or Bactrim
- Typical dosing: 100U for idiopathic OAB, 200U for neurogenic OAB
- F/u: If not catheterizing, 2 wks with PVR. If catheterizing, f/u prn

Urethral bulking/Macroplastique
- Preop: PO Cipro or Bactrim
- F/u: 2 wks

Hydrodistension
- F/u prn

SPC Placement
- Preop: PO Cipro or Bactrim
- F/u: RTC 1 mo

INFERTILITY

Vasectomy reversal (Vasovasostomy / Vaso-epididymovostomy)

Pre-op:

- Ancef 2 gm IV x 1 (unless PCN allergic)

Post-op:

- D/C home.
- Ice x 48 hours.
- Scrotal support x 1 week.
- Antibiotic ointment 3x/day x 1 week.
- No strenuous activity x 2 weeks
- No ejaculation for 3 weeks.

Follow up:

- Return to clinic for post-op evaluation in 2-4 weeks

Scripts:

- Vicodin 20 tablets

Varicocele ligation

Pre-op:

- Ancef 2 gm IV x 1 (unless PCN allergic)

Post-op:

- D/C home.
- No strenuous activity or sex for 2-3 weeks.
- Remove dressing in 48 hours.
- Remove steri-strips in 1 week.

Follow up:

- 7-10 days for wound check.
- semen profile in 3-4 months.

Scripts:

- Vicodin 20 tablets

Testicular biopsy/TESE/MicroTESE

Pre-op:

- Ancef 2 gm IV x 1 (unless PCN allergic)Post-op:
- D/C home.
- Ice x 48 hours.
- Scrotal support x 1 week.

INFERTILITY (Continued)

- Antibiotic ointment 3x/day x 1 week.
- No strenuous activity or sex x 2-3 weeks.

Follow up:
- 7-10 days for wound check.

Scripts:
- Vicodin 20 tablets

LAPAROSCOPY

General

Pre-op:

- Ancef 2 gm IV q8h x 2 doses (or weight based) (PCN allergic - clindamycin 600mg IV q8h x 2)
- Type and screen all kidney/prostate cases, type and cross for 2 Units PRBCs for partial nephrectomy or any Hgb <10.

General Post-op:

- Clear liquids post-op then advance to regular diet on POD #1. (Regular diet for prostate.)
- Ambulate as tolerated on POD#0 (except lap partial nephrectomy – Bed rest overnight), then ambulate TID on POD #1.
- CBC/BMP on POD#1 for all kidney cases. Check CBC in PACU for EBL >500ml or as clinically indicated. Prostate need labs only as clinically indicated.
- Pain (all patients): scheduled Tylenol 650 mg q 6 h unless there is liver disease, ice pack to wounds q 1 h prn pain.
- Prostate: toradol 15mg IM q6h unless pre-op creatinine > 1.2, then use oxycodone 5 mg po q 4 h prn break through pain. Plan for DC POD #1.
- Kidney: No toradol. oxycodone 5 mg po q4h prn pain, dilaudid 0.4-0.8 mg IV q 2 h prn BTP.

Discharge:

- D/C on or after POD#1 as clinically indicated.
- Ice pack to wound as necessary for 15 minutes every hour for pain.
- Scripts: All patients – Colace 100mg po bid (#30), tramadol 50mg po q4h prn pain (#15)
- Prostate patients add oxybutynin 5mg po tid prn bladder spasm (#10), [if creatinine <1.2 also give oral ibuprofen 600mg po q6h with plenty of fluids prn pain (#20)]
- Prostate follow-up:
  - D/C with foley to gravity.
  - Leg bag training.
  - Kegel exercise instructions.
  - 1 week with RN visit for catheter removal (can be done with local physician), 2 months for PSA check (should already be scheduled)
- Kidney follow-up: 1 month

Prostatectomy (Lap / Robotic)

Intra-op:

Ports for robotic - *Note: there should be at least 6 cm between robot ports.*
12 mm; camera port just above the umbilicus (vertical incision normally, transverse incision for umbilical hernia, 12mm port passed through hernia, use

LAPAROSCOPY (Continued)

Hassan approach and Kii balloon trocar for large hernia or prior abdominal incision within 8cm of umbilicus), 8 mm robot port 10-12 cm to left and 3 cm from inferior to umbilicus, 12mm assistant port on left superior to/even with umbilicus ~5cm left, 8 mm robot port ~8 cm to right of and even with umbilicus, 8 mm port 2 fingerbreadths above ASIS in anterior clavicular line and at least a handbreadth from the right robotic arm. [Modifications for Xi – move 4th arm cephalad 3-4 cm.]

Pyeloplasty / Partial Nephrectomy (Lap)

Post-op:

- D/C foley on POD#1, D/C drain prior to D/C if output <150ml after foley removed or creatinine of drain fluid is normal
- D/C to home on POD#1-2 +/- JP drain

Discharge:

- Follow up in 5-7 days for drain removal if applicable.
- Cystoscopy with stent removal in 1 month (if stent is present).

Nephroureterectomy (Lap)

Post-op:

- D/C with foley to gravity. RN visit for catheter removal on POD#7

NEPHROLITHIASIS

Cystoscopy ± RPG ± Stent Insertion

Pre-op:

- Ancef 1 gm IV x1 (PCN all Cipro 400 mg IV x1 OR Gentamicin 80-100 mg IV x1)

Post-op:

- D/C foley in recovery if has one
- Cipro 500 mg po BID or Bactrim DS po BID x 2 doses, Percocet

Ureteroscopy / Ureteral Stent

Pre-op:

- Make sure urinalysis with or without culture in advance. If none present order UA with micro and be sure to inform preop nurse to send STAT (this takes approximately one hour to run) If in in a time crunch sometime faster to walk up to urology clinic and run the test.
- **Preoperative Antibioitics (Bundle):** Bactrim DS PO, Keflex 1000mg PO, Cipro 500mg PO. Cefazolin 1-3g IV, For double coverage add Gentamicin 5mg/kg IV (CrCl >30) 2mg/kg (CrCl <30) IF JOINT REPLACEMENT <2 years or high risk: Levaquin 500mg po, Ampicillin 1-2 grams + gentamicin, Vancomycin + gentamicin (if beta lactam allergy)
- **Rooms:** make sure you are in the correct room if using laser (AIP: 12B, 15, 16, 18, 26-30, AOP: 14)
- **Equipment:** Make sure if using Olympus equipment, the tower is present had has been tested.
- **Bed:** make sure you are on a slider bed otherwise will need to move the patient to the end of the table
- **Fluoroscopy:** Call once the patient is in the room and request laser sight (For Higuchi, request foot pedal).
- **Anesthesia:** General with ETT especially if rigid ureteroscopy near the vessels
- **Positioning:** SCD, lithotomy, may tuck are if easy otherwise out the side
- **Prep:** Standard for men, women vaginal prep
- **Disposables:** get all necessary equipment in the room ahead of time. DO NOT rely on staff to get what you need otherwise you may be waiting

Intra-op:

- Lidocaine jelly before starting procedure, Toradol immediately after induction if creatinine clearance >30 (Higuchi), B&O suppository for women (Higuchi)
- Make sure assistant flushes all wires, catheters and sheaths
- Use 50/50 contrast
- 22Fr rigid cystoscope → retrograde pyelogram → sensor wire (Maroni likes the benson)
- Rigid ureteroscopy (use SAP) → if difficulty passing may use 8/10 or second wire → use 200um laser (start with 0.8 joules and 8 hertz) → basket with nitinol OR

Bagley → determine Traxner grade → stent +/- dangle depending on ureteral trauma

- Flexible ureteroscopy → after safety wire may use 8/10 coaxial to pass superstiff (Maroni) or dual lumen (Higuchi)→ insert sheath 11/13 (difficult to maneuver scope, but easier to insert), 12/14 (ideal size), 13/15 (best in pre-stented ureter), if difficulty passing can use inner sheath first then outer OR brace sheath transvaginally in females and by bracing the bulbous urethral in men → use SAP or pressure bag (only use when access sheath in place) → 200um laser for lower pole stones, 350 um for upper and mid → nitinol basket to remove stones → back scope down under direct vision to identify Traxner injury → stent +/- dangle depending on ureteral trauma
- MAKE SURE TO SEND STONES FOR ANALYSIS and culture if recurrent UTI
- FOR CANCER CASES:
    - May need to get cytology from 5fr need at least 30ml (may barbotage with normal saline)
    - Cook brush biopsy (advance brush and aggressive brush urothelium then withdrwal with brush deployed and cut and put in container with saline, this goes to cytology).
    - Nitinol or BIGopsey to biopsy (this is loaded retrograde), hemostasis with bugbey or laser
- IF you leave a stent on a dangle make sure to secure to patient with tegaderm or steri strips to make sure it does not get inadvertently pulled.

Post op:

- Prescriptions: Oxycodone, norco or ultram (makes sure to give enough for minimum of . 7 days 40-50 tablets). Pyridium if creatinine <2.0. Tamsulosin (qty 30) Oxybutinin (qty 30, only for females) Antibiotics: To match preoperative antibiotics for 3 days. If on antibiotics preoperatively, may continue till gone.
- **Stents:**
    - **Self removal:** 3-5 days postoperatively. Recommend hydration, pretreat themselves with pain medication and do in the shower or bath because they will leak urine with removal
    - **Cystoscopy:** 2-4 weeks depending on provider. Can place order by opening new orders only encounter (must be a new order outside of surgical admission)→ cystoscopy with rem stent → accept order → route to scheduler (p uro green scheduling for urology clinic)

Follow-up: 2-4 weeks
If metabolic stone evaluation, usually wait until 6 weeks after stone removal

- **Self removal:** 3-5 days postoperatively. Recommend hydration, pretreat themselves with pain medication and do in the shower or bath because they will leak urine with removal
- **Cystoscopy:** 2-4 weeks depending on provider. Can place order by opening new orders only encounter (must be a new order outside of surgical admission)→

cystoscopy with rem stent → accept order → route to scheduler (p uro green scheduling for urology clinic)

Percutaneous Nephrolithotomy (PCNL/PUP)

Pre-op:

- Make sure urinalysis with or without culture in advance. If none present order UA with micro and be sure to inform preop nurse to send STAT (this takes approximately one hour to run) If in in a time crunch sometime faster to walk up to urology clinic and run the test. Will also want a type and screen..
- **Preoperative Antibioitics (Bundle):** Cefazolin 1-3g. For double coverage add Gentamicin 5mg/kg IV (CrCl >30) 2mg/kg (CrCl <30). IF JOINT REPLACEMENT <2 years or high risk: Levaquin 500mg po, Ampicillin 1-2 grams + gentamicin, Vancomycin + gentamicin (if beta lactam allergy)
- **Rooms:** make sure you are in the correct room if using laser (AIP: 12B, 15, 16, 18, 26-30, AOP: 14)
- **Equipment:** Make sure if using Olympus equipment, the tower is present had has been tested.
- **Bed:** make sure you have the split leg bed or slider bed and can use with fluoroscopy.. Will use gel rolls (they are radiolucent) and get 6 pillows
- **Fluoroscopy:** Call once the patient is in the room and request laser sight (For Higuchi, request foot pedal). For RIGHT sided PNL fluoroscopy needs to be in the room first, LEFT sided fluoroscopy and come in the room after the patient is positioned.
- **Anesthesia:** General with ETT. Will induce on patient bed, then roll into position
- **Positioning:** Split leg prone, patient will need to have genitalia near the split leg to get access. Try to get bottom of gel pads to rest on ASIS and the top on the shoulder. Pad legs with pillows and secure with foam and tape. Arms on pillows. For prone without split leg same position, but put catheter in while patient being induced.
- **Prep:** chlorhexidine to the back and then spray benzoin to get drape to stick. Standard for men, women vaginal prep
- **Disposables:** get all necessary equipment in the room ahead of time. DO NOT rely on staff to get what you need otherwise you may be waiting

Intra-op:

- Lidocaine jelly before starting procedure, Toradol immediately after induction if creatinine clearance >30 (Higuchi), B&O suppository for women (Higuchi)
- Make sure assistant flushes all wires, catheters and sheaths
- Use 50/50 contrast

  FOR RETROGRADE/ANTEGRADE
- 22Fr rigid cystoscope or flexible cystoscopy if difficult (REMEMBER you are upside down and can adjust the camera pitch to help)→ retrograde pyelogram → sensor wire (Maroni likes the benson)→ after safety wire may use 8/10 coaxial to pass superstiff (Maroni) or dual lumen (Higuchi)→ insert sheath 11/13 (difficult to maneuver scope, but easier to insert), 12/14 (ideal size), 13/15 (best in pre-

stented ureter), if difficulty passing can use inner sheath first then outer OR brace sheath transvaginalf in females and by bracing the bulbous urethral in men → use SAP or pressure bag (only use when access sheath in place) → identify posterior calyx for access (if difficult can inject air) → may need to laser to get to targeted calyx.

- Target calyx (bullseye technique) → inject with local and make incision → advance TLA introducer or spinal needle under fluoroscopy (usually at 0 degrees) → can visualize entering with ureteroscope OR return of urine → advance wire and get down ureter (either use Kumpe or basket wire with ureteroscope) → 8/10 or dual lumen to get superstiff wire down → get nephromax dilate to 14atm (make sure the protect sheath is removed from the balloon and the sheath is on the balloon; let this sit and get the shockpulse ready) → shockpulse and remove fragments (remember to keep straight for best efficacy) → may use nephrostomy tube and ureteral stent (attending preference) → secure with suture → put pressure dressing on back (if bleeding hold pressure, increase ml in balloon, Kaye tampanode balloon, floseal)
- MAKE SURE TO SEND STONES FOR ANALYSIS and culture if recurrent UTI
- Make sure patient has foley catheter
- IF you leave a stent on a dangle make sure to secure to patient with tegaderm or steri strips to make sure it does not get inadvertently pulled.

Post op:

- CBC, BMP and Chest xray in PACU
- Admit for extended recovery:
    - Continue antibiotics x24h unless otherwise noted
    - IVF 100-125/hour
    - Ditropan and B&O for pain
    - Pain control with po and IV (may need PCA in select cases)
    - DVT prophylaxis – SCD may ask attending about heparin
    - Diet: ADAT
    - CT KUB overnight to check for stone burden
    - May cap nephrostomy tube on PM rounds if urine clear (Higuchi) otherwise ask.
- POD#1: If negative CT plan for discharge
    - Ask attending about which tube to remove, but typically remove nephrostomy tube first (pull out and wait, if pulsatile bleeding hold pressure and call IR) followed by catheter. Have patient void prior to discharge and check PVR (especially men with BPH)
- Prescriptions: Oxycodone, norco or ultram (makes sure to give enough for minimum of . 7 days 40-50 tablets). Pyridium if creatinine <2.0. Tamsulosin (qty 30) Oxybutinin (qty 30, only for females) Antibiotics: To match preoperative antibiotics for 3 days. If on antibiotics preoperatively, may continue till gone.
- **Stents**:
    - **Self removal:** 3-5 days postoperatively. Recommend hydration, pretreat themselves with pain medication and do in the shower or bath because they will leak urine with removal

- **Cystoscopy:** 2-4 weeks depending on provider. Can place order by opening new orders only encounter (must be a new order outside of surgical admission)→ cystoscopy with rem stent → accept order → route to scheduler (p uro green scheduling for urology clinic)

Follow-up: 2-4 weeks
If metabolic stone evaluation, usually wait till 6 weeks after stone removal

- **Self removal:** 3-5 days postoperatively. Recommend hydration, pretreat themselves with pain medication and do in the shower or bath because they will leak urine with removal
- **Cystoscopy:** 2-4 weeks depending on provider. Can place order by opening new orders only encounter (must be a new order outside of surgical admission)→ cystoscopy with rem stent → accept order → route to scheduler (p uro green scheduling for urology clinic)

ONCOLOGY

Cystectomy And Urinary Diversion (Radical, Open/Lap/Robotic)

Per Onc Pathway:

Preop:

- Patients do best when have had max. resection wo perf and chemo (GC/MVAC x 3-6 cycles 4-6 if nodes worrisome)
- Prefer marking by stoma therapist
- Please use antibiotics agreed to by SSI committee based on our sensitivities. Should cover anaerobes, cefoxitin standard
- Noloxogol or Entereg should be given in pre-op bay to decrease ileus
- DVT prophylaxis with SCDs, injection of heparin pre-op if high risk
- Epidural analgesia offered for all
- Bowel prep and colonoscopy if right colon pouch is to be performed
- In general for history of radiation, conduit preferred, high risk of stricture, complication for complex surgery
- Supine for men, lithotomy for women
- Creatinine above 2, normal hand function, vested family and patient with access to medical care, normal liver function, no XRT for continent diversion

Intra-op:

- Supine for men, lithotomy for women (aids in removing urethra or finding vaginal plane) and for men who also need a urethrectomy/(penectomy)
- SCD's
- TxC x 2 for men x 4 for women
- No NG tube, ERAS protocol
- FlowTrack can determine hydration so pt is not over-hydrated (which may cause more ileus)
- Most men have prostate removed with surgery
- Most women can have ovaries and uterus remaining in tact. Anterior vaginal wall resection will depend on tumor invasion and frozen sections
- All patients should have back up option if frozen of urethra is positive if continent orthotopic choice is selected

Post op:

- **Remove vag packing POD#1** – don't forget
- BID noloxogol or entereg to decrease post-op ileus (keeps pain meds from acting on mu receptors on bowel)
- Abx x 48hrs, in EPIC order set
- Consult pain service for epidural
- Daily labs
- Consult PT on everyone
- Consult SW for home health v. LTAC etc on everyone
- Consult stoma therapist to educate patient on flushing (neobladder) or stoma

- No NG tube unless specified NPO except meds
- DVT prophylaxis with SCDs and heparin
- Sips of clears POD 0, slow clears until flatus, regular diet after flatus
- Chewing gum, ambulating, less narcotics improve ileus
- Delerium common, avoid agents that might increase risk.
- Return to NPO, consider NGT for N/V
- KUB for N/V. Call attending for colon dilation >10cm (risks perf)
- Cystogram on POD 3-6 requires weekday ordering, generally day prior to discharge
    - Maroni does stentogram
- Remove JP if cystogram negative
- No need to sent JP fluid for creatinine unless expecting very big leak causing
- Continent diversions (irrigate q6 hours around the clock, resident to perform 1 per day) separate foley from collection back and irrigate through opening to foley, focus on removing mucous that may clog foley
- Check testosterone and give T if prolonged course and FTT

Discharge:

- F/u in 1-2 weeks to see MD or nurse (just to make sure patient is not really off track)
- Pain meds
- No abx unless leak is present or JP is still left in place (SW)

Re-admit: (of course this never happens)
- Generally go to Urology if still have tubes in place from surgery but can go to medicine if medicine service will accept patient
- Most frequent scenarios:
    ileus/partial SBO, fluids, NGT, time
    pyelo – cx, abx (broad to narrow), CT r/o abscess
    bacteremia – cx, abx (broad to narrow CT r/o abscess
    sepsis – rescussitate, cx, abx (broad to narrow), CT r/o abscess eventually

*** Please let attending know any time patient seems unhappy with care, these are complicated patients and attendings want to stay in the loop

Nephrectomy, Partial and Radical (Open/Lap/Robotic)

Pre-op:

- Ancef 1 gm IV q8h x 2 doses (PCN allergic - Vanc 1 gm IV x1 + gent)
- Epidural or Single Shot Spinal for some staff when an Open case
- Bowel prep for locally-advanced disease or if anticipated colon resection (not Cost, practice of other faculty members is unknown)

Intra-op:

- Chlorhexidine skin prep

Post-op:
- D5LR or NS at 100-150 cc/hr (No K in IVF until renal function returns)
- Epidural per APMS
- Daily weights
- CBC/BMP (in PACU and POD#1, further lab draws are tailored to each patient/staff)
- CLD POD#0 and advance as tolerated. Encourage chewing gum
- SCDs; Heparin SQTID dosing (always ask Faculty post op).

POD#1:
- Change IVF to D51/2NS (+/- KCL), start to turn down rate if taking PO, do not over hydrate
- ADAT d/c foley if robotic/laparoscopic, keep foley if Epidural in
- OOB Q2-4 hours
- Ambulate QID at least (unless staff specifies bed rest)
- No more BMP/CBC if labs stable and no concerns (check with faculty)

POD#2:
- D/C epidural per APMS on POD#2 or 3 depending on PO intake
- D/C foley once Epidural out
- Keep JP (if present) to bulb suction until after foley out. Monitor JP output. Check with Faculty about sending JP fluid for Creatinine

Discharge:
- D/C home after on Reg diet and having BM. Send out on a bowel regimen

Scripts:
- Percocet, Colace, and/or Miralax

Follow-up:
- Follow-up in 4-6 weeks with staff + BMP

Nephroureterectomy

Pre-op:
- Please use SSI bundle created with AUA guidelines and UCH guidelines (Ancef 2g is standard).
- Patients should have negative urine culture or at least dip prior to surgery if at all possible

Intra-op:
- There are 2 parts to surgery, the nephrectomy, usually done laparoscopically, and the ureter with cuff of bladder, usually done

  - Open with Dr. Wilson/Pshak
  - Robotically with Dr. Maroni
- JP drain is left for any surgery that opens the GU tract

Discharge:
- D/C on POD#2-3 with foley catheter
- JP usually removed when output less than 30-100 per day in hospital
- F/U in 1-3 weeks, cystogram prior to appointment

Scripts:
- Pain meds
- Some attendings may do antibiotics with foley in place or just with foley removal

Orchiectomy (Radical / Inguinal)

Pre-op:
- Ancef 2 gm IV x 1 (PCN allergic – Clindamycin 600mg IV x 1)

Discharge:
- Apply ice pack to incision for 15 minutes every hour as needed for pain.
- Tylenol 650mg po q6h prn pain
- Ibuprofen 600mg po tid with meals prn pain
- Instruct patient to pull prosthesis down (if applicable) TID for 2 weeks.
- D/C with scrotal support. Instruct to keep pressure on the area with a clean bandage for 1 week.

Scripts:
- Tramadol 50mg po q4 h prn pain #15

Prostatectomy (Radical)

Pre-op:
- Ancef 1 gm IV q8h x 2 doses (PCN allergic - Vanc + Gent)
- No mechanical bowel prep
- DVT prophylaxis preop and continue until d/c

Intra-op:
- general, Open—Center lower abdomen under OR lights

Post-op:
- D5LR or NS at 100 cc/hr
- CBC, BMP in PACU; no BMPs unless indicated Epidural per APMS or Toradol 15 mg IV q8H (Gong 30 mg IV q6Hx48 hours)

- DO NOT USE LOVENOX. Percocet only for breakthrough pain
- Daily weights; Always ask staff before suppositories
- Clears post op, OOB to chair on evening of POD 0

POD#1:
- if epidural placed then d/c epidural on POD#1 (communicate with APMS) and transition to Toradol 30 mg IV x1, then Toradol 15 mg IV q6h x 48 hours
- Tylenol 650 mg q4h prn + Morphine 2-4 mg q3h prn for BTP GI soft in AM
- OOB Q2hours ambulating
- Call staff if high JP output, decrease IVF to minimize leak.
- D/C drain before discharge Haber: discharge with drains in place
- Fareed D/c JP if output <50 cc/shift, if over 50 then send for Cr if same as serum then d/c
- Gong – case management consult for home lovenox x 4 weeks. Stein CM consult for home going lovenox x 3 weeks

Discharge:
- D/C home with foley on POD#1 sometimes 2

Scripts:
- Ibuprofen 600 mg TID x 1 week, Percocet (no narcs) PDE5 inhibitor if bilateral or unilateral nerve-sparing to take PRN 1 hour prior to intercourse on an empty stomach if getting partial erections
- Ferrous sulfate BID x 30 days if POD 1 Hb<9.0
- Per onc pathway no need for abx prior to foley removal or ditropan PRN
- Historically give Cipro or Bactrim BID x 3 days to start day before catheter removal.
- Give cipro or bactrim QD until 48 hours after foley removal
- Ask staff re: home going lovenox

Follow-up:
- Follow-up in 2 weeks with PA/RN for catheter removal.
- Get cystogram prior to removal for robotic prostatectomies
- Follow-up with staff in 6-8 weeks with PSA (add testosterone level if ADT given preop)
- (SCC—RTC with SCC in 10-14 days no cystogram unless robotic and have CBC,BMP prior to appointment).

RPLND (Retroperitoneal Lymph Node Dissection)

Pre-op:
- Ancef 2 gm IV q8h x 2 (PCN allergic - Clindamycin 600 mg IV q8h x 2)
- No bowel prep
- No heparin preop
- Pre-op epidural or intrathecal per patient preference

ONCOLOGY (Continued)

Intra-op:
- Chloraprep
- OGT

Post-op:
- CBC,BMP in PACU if EBL >500ml
- Incentive spirometry q1h
- For post chemotherapy patients receiving Bleomycin – tolerate spO2 of 88% and wean oxygen aggressively
- IVF at 100ml/hr. Do not bolus. Call resident for instructions with tachycardia or low urine output.
- OOBTC on POD 0
- Clear liquid diet, advance as tol

POD 1:
- Heparin 5000 U SQ TID
- Ambulate TID
- Regular diet
- Heplock IV
- CBC, BMP (Labs only as clinically indicated after POD1)
- Communicate with pain team – epidural out in morning of POD2 and toradol 15mg iv q6h is ok on POD2
- D/c foley (unless epidural present)

POD 2:
- D/C epidural, foley, and monitors.

Discharge:
- Follow up in one month
- Apply ice pack to incision for 15 minutes every hour as needed for pain.
- Tylenol 650mg po q6h prn pain
- Ibuprofen 600mg po tid with meals prn pain

Scripts:
- Oxycodone 5mg po q4 h prn pain (#30)
- Colace 100mg po bid (#30)

Transplant - Kidney

General Information

If scrubbing in on a transplant case with Dr. Pshak, know the patient's history (including pre-operative urine output), indication for transplant, current renal replacement therapy and immunological risk. You will be told what to do with everything else after that.

ONCOLOGY (Continued)

EPIC Order sets:
Pre-op: "uch kidney/pancreas transplant Pre-Op"
Post-op: "uch kidney/pancreas transplant Post-Op"
Induction: "uch kidney/kidney/pancreas Thymoglobulin Induction Therapy"

Induction:
This depends on patient's immunological risk. Not all patients receive thymoglobulin induction; this is different from most other centers in the US.

Prophylactic antimicrobials:
- Pneumocystis Carinii Pneumonia (PCP):
  - Bactrim SS x 18 mths
  - Sulfa allergy: Pentamadine or Dapsone (check G6PD first)
- Fungal :
  - None
- CMV:
  - Valcyte, but depends on risk and status of donor/recipient
  - Handled by transplant inpatient pharmacist
- Stent PPx:
  - Keflex daily until stent removed

Immunosuppression:
- Most patients are on Tacrolimus, Myfortic, and Prednisone post-op.
- Some patient elect for steroid withdrawal protocol. Long term graft survival is not as good with this regimen

Donor Nephrectomy:
This is always performed hand assisted, trans-abdominal on the transplant service

TURBT (Transurethral resection of bladder tumor) or Bladder Biopsy
Pre-op
- Bactrim PO first line per AUA guidelines
- Ancef if sulfa allergy
- ideally a urine culture or UA should suggest no UTI. Sometimes this is difficult when pt is from out of town, UA dips can be done in pre-op with little delay.

Post-op
- D/C foley in PACU after I hour of mitomycin if this is given.
- 5% get admitted for too much hematuria (may need gentle CBI).
- If bladder is thin or concern for high pressure voiding may go home with a catheter.
- Generally no antibiotics to go home with unless there is a question about pre-op UA/culture.

Follow-up
- 2 – 4 weeks. Attending often calls patient but this guarantees nothing is missed

Oncology (Continued)

Post-TURBT Chemo

- Contraindicated if bladder perforation
- Order Mitomycin C 40 mg in 40 CC NS
- Instill in OR or PACU and plug catheter x 1 hour
- Drain and nurse may remove foley

PROSTHETICS AND RECONSTRUCTION

SECTION
PENDING

1. Artificial Urinary Sphincter (AUS)
2. Inflatable Penile Prosthesis (IPP)

TRANSURETHRAL PROSTATE BIOPSY

Transurethral Resection of Prostate (TURP)

- Make sure urinalysis with or without culture in advance. If none present order UA with micro and be sure to inform preop nurse to send STAT (this takes approximately one hour to run) If in in a time crunch sometime faster to walk up to urology clinic and run the test.
- **Preoperative Antibioitics (Bundle):** Bactrim DS PO, Keflex 1000mg PO, Cipro 500mg PO. For double coverage add Gentamicin 5mg/kg IV (CrCl >30) 2mg/kg (CrCl <30) IF JOINT REPLACEMENT <2 years or high risk: Levaquin 500mg po, Ampicillin 1-2 grams + gentamicin, Vancomycin + gentamicin (if beta lactam allergy)
- **Equipment:** Make sure if using Olympus equipment, the tower is present had has been tested. Need the thunderbeat tower and loop and button. Make sure PVP is present.
- **Bed:** make sure you are on a slider bed otherwise will need to move the patient to the end of the table
- **Anesthesia:** General with ETT or LMA depending on size of tumor
- **Positioning:** SCD, lithotomy, may tuck are if easy otherwise out the side
- **Prep:** Standard for men, women vaginal prep
- **Disposables:** get all necessary equipment in the room ahead of time. DO NOT rely on staff to get what you need otherwise you may be waiting

Intraop:

- Lidocaine jelly before starting procedure, B&O suppository, Toradol immediately after induction if creatinine clearance >30 (Higuchi)
- TURP → if needed dilate the urethral with Van Buren sounds (don't try to force the scope as this can lead to meatal stenosis) → mark UO with cautery (Higuchi) → to help with bubbles place in reverse trendelenberg → do not take resection beyond verumontanum.
- PVP → start with low setting on bladder neck of 80watts → prostate bleeds the most at apex and anterior bladder neck.
- To help with hemostasis after the catheter is inflated, tie a 4x4 to the catheter and pushing into penis – ONLY LEAVE THIS ON FOR ONE HOUR.

Post op:

- Prescriptions: Oxycodone, norco or ultram (makes sure to give enough for minimum of 7 days 40-50 tablets). Pyridium if creatinine <2.0. Antibiotics: To match pre-operative antibiotics for 3 days. If on antibiotics preoperatively, may continue til gone.
- Catheter is attending dependent: Barqawi is next day, Higuchi is variable.

Photovaporization of Prostate (PVP)

Follow same guidelines as for Transurethral Resection of the Prostate (TURP)

ADULT URODYNAMICS: AUA/SUFU GUIDELINE

J. Christian Winters, Roger R. Dmochowski, Howard B. Goldman, C.D. Anthony Herndon, Kathleen C. Kobashi, Stephen R. Kraus, Gary E. Lemack, Victor W. Nitti, Eric S. Rovner, Alan J. Wein

Approved by the AUA Board of Directors April 2012

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Purpose: This guideline is intended to review the literature regarding the use of urodynamic testing in common lower urinary tract symptoms (LUTS) conditions. It presents the principles of application and technique to guide the clinician in the role of urodynamics in complex LUTS disorders. As urodynamics is only one part of the comprehensive evaluation of LUTS, the findings of this guideline are intended to assist the clinician in the appropriate selection of urodynamic tests following an appropriate evaluation and symptom characterization.

Methods: A systematic review of the literature using the MEDLINE® and EMBASE databases (search dates January 1, 1990 to March 10, 2011) was conducted to identify peer-reviewed publications relevant to the use of urodynamic tests for diagnosis, prognosis, guidance of clinical management decisions and improvement of patient outcomes in patients with various urologic conditions. The review yielded an evidence base of 393 studies after application of inclusion/exclusion criteria. These publications were used to inform the statements presented in the guideline as Standards, Recommendations or Options. When sufficient evidence existed, the body of evidence for a particular treatment was assigned a strength rating of A (high), B (moderate) or C (low). In the absence of sufficient evidence, additional information is provided as Clinical Principles and Expert Opinion.

Guideline Statements

Stress Urinary Incontinence (SUI)/Prolapse

1. Clinicians who are making the diagnosis of urodynamic stress incontinence should assess urethral function. (*Recommendation*; Evidence Strength: *Grade C*)

2. Surgeons considering invasive therapy in patients with SUI should assess post-void residual (PVR) urine volume. *(Expert Opinion)*

3. Clinicians may perform multi-channel urodynamics in patients with both symptoms and physical findings of stress incontinence who are considering invasive, potentially morbid or irreversible treatments. (*Option*; Evidence Strength: *Grade C)*

4. Clinicians should perform repeat stress testing with the urethral catheter removed in patients suspected of having SUI who do not demonstrate this finding with the catheter in place during urodynamic testing. (*Recommendation*; Evidence Strength: *Grade C*)

5. Clinicians should perform stress testing with reduction of the prolapse in women with high grade pelvic organ prolapse (POP) but without the symptom of SUI. Multi-channel urodynamics with prolapse reduction may be used to assess for occult stress incontinence and detrusor dysfunction in these women with associated LUTS. (*Option*; Evidence Strength*: Grade C)*

Overactive Bladder (OAB), Urgency Urinary Incontinence (UUI), Mixed Incontinence

6. Clinicians may perform multi-channel filling cystometry when it is important to determine if altered compliance, detrusor overactivity or other urodynamic abnormalities are present (or not) in patients with urgency incontinence in whom invasive, potentially morbid or irreversible treatments are considered. (*Option;* Evidence Strength: *Grade C)*

7. Clinicians may perform pressure flow studies (PFS) in patients with urgency incontinence after bladder outlet procedures to evaluate for bladder outlet obstruction*. (Expert Opinion)*

8. Clinicians should counsel patients with urgency incontinence and mixed incontinence that the absence of detrusor overactivity (DO) on a single urodynamic study does not exclude it as a causative agent for their symptoms*. (Clinical Principle)*

Neurogenic Bladder (NGB)

9. Clinicians should perform PVR assessment, either as part of a complete urodynamic study or separately, during the initial urological evaluation of patients with relevant neurological conditions (e.g., spinal cord injury and myelomeningocele) and as part of ongoing follow-up when appropriate. (*Standard;* Evidence Strength: *Grade B*)

10. Clinicians should perform a complex cystometrogram (CMG) during initial urological evaluation of patients with relevant neurological conditions with or without symptoms and as part of ongoing follow-up when appropriate. In patients with other neurological diseases, physicians may consider CMG as an option in the urological evaluation of patients with LUTS. (*Recommendation*; Evidence Strength: *Grade C*)

11. Clinicians should perform pressure flow analysis during the initial urological evaluation of patients with relevant neurological conditions with or without symptoms and as part of ongoing follow-up when appropriate, in patients with other neurologic disease and elevated PVR or in patients with persistent symptoms. (*Recommendation*, Evidence Strength: *Grade C)*

12. When available, clinicians may perform fluoroscopy at the time of urodynamics (videourodynamics) in patients with relevant neurologic disease at risk for neurogenic bladder, in patients with other neurologic disease and elevated PVR or in patients with urinary symptoms. (*Recommendation*; Evidence Strength: *Grade C*)

13. Clinicians should perform electromyography (EMG) in combination with CMG with or without PFS in patients with relevant neurologic disease at risk for neurogenic bladder, in patients with other neurologic disease and elevated PVR or in patients with urinary symptoms. (*Recommendation*; Evidence Strength: *Grade C*)

LUTS

14. Clinicians may perform PVR in patients with LUTS as a safety measure to rule out significant urinary retention both initially and during follow up. *(Clinical Principle)*

15. Uroflow may be used by clinicians in the initial and ongoing evaluation of male patients with LUTS when an abnormality of voiding/emptying is suggested. (*Recommendation*; Evidence Strength: *Grade C)*

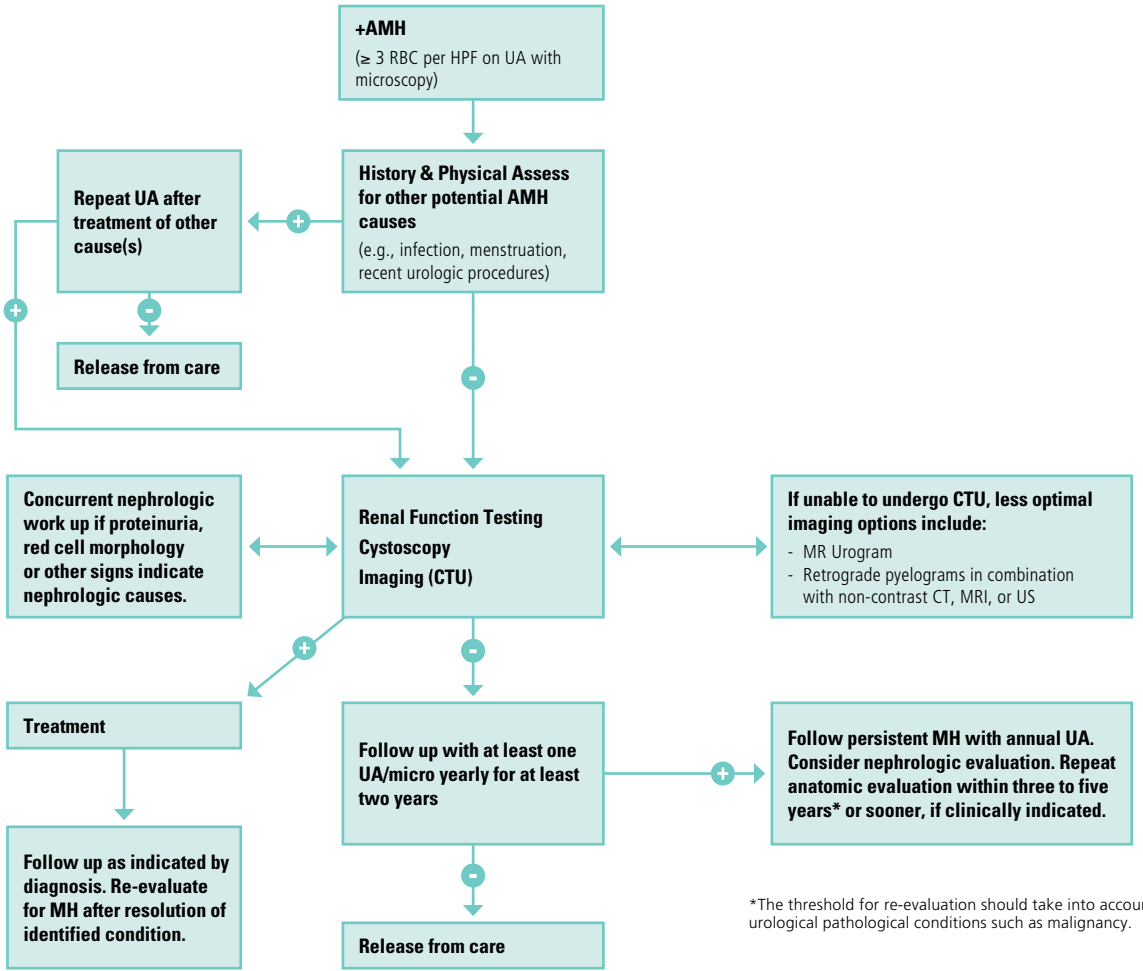
16. Clinicians may perform multi-channel filling cystometry when it is important to determine if DO or other abnormalities of bladder filling/urine storage are present in patients with LUTS, particularly when invasive, potentially morbid or irreversible treatments are considered. (*Expert Opinion*)

17. Clinicians should perform PFS in men when it is important to determine if *urodynamic* obstruction is present in men with LUTS, particularly when invasive, potentially morbid or irreversible treatments are considered. (*Standard*: Evidence Strength: *Grade B)*

18. Clinicians may perform PFS in women when it is important to determine if obstruction is present. (*Option*; Evidence Quality: *Grade C*)

19. Clinicians may perform videourodynamics in properly selected patients to localize the level of obstruction, particularly for the diagnosis of primary bladder neck obstruction. *(Expert Opinion)*

Diagnosis, Evaluation and Follow-up of AMH (Asymptomatic Micro-Hematuria)



*The threshold for re-evaluation should take into account patient risk factors for urological pathological conditions such as malignancy.

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Bladder Cancer

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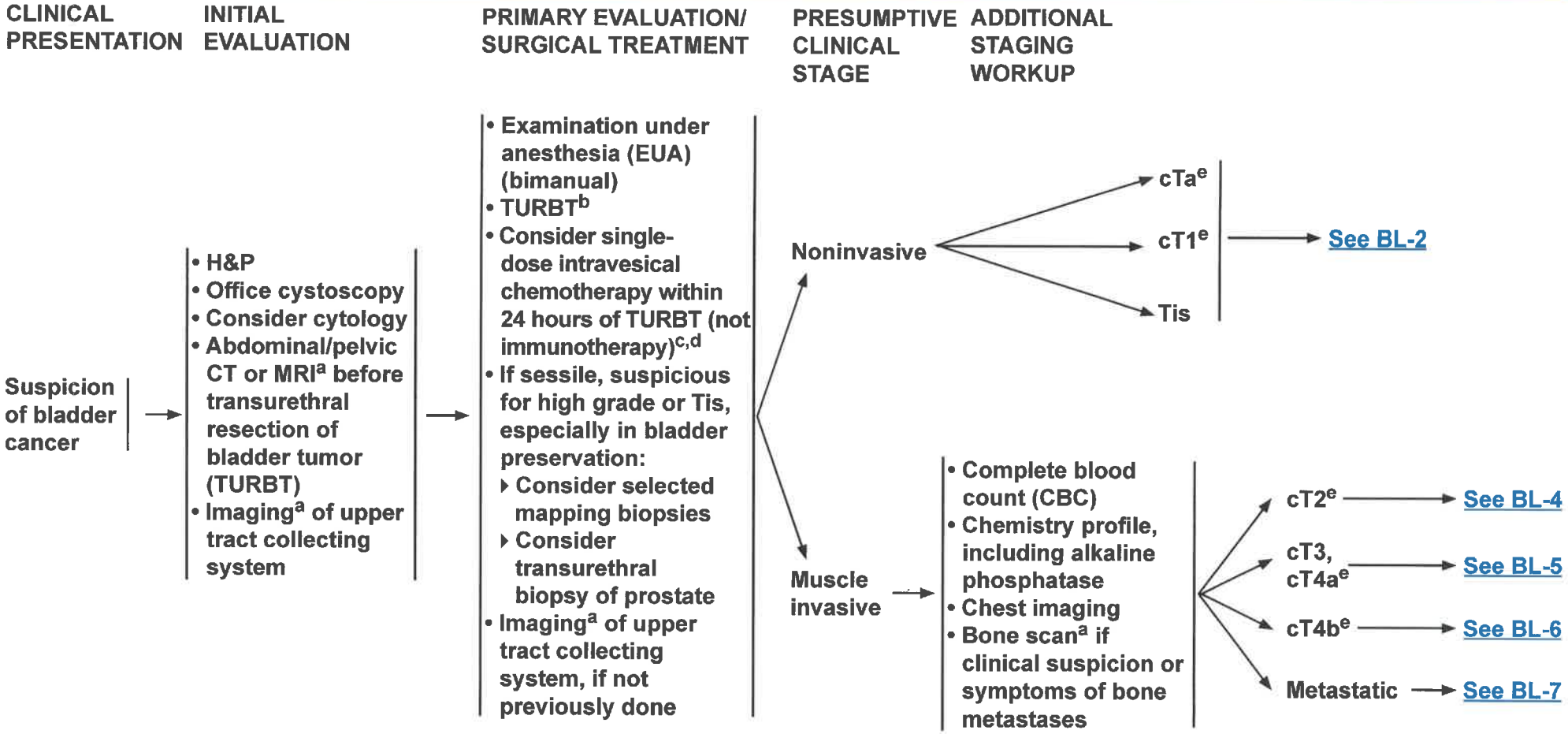

[a] See Principles of Imaging for Bladder/Urothelial Cancer (BL-A).
[b] See Principles of Surgical Management (BL-B).
[c] Immediate intravesical chemotherapy, not immunotherapy, has been shown to decrease recurrence in select subgroups of patients.
[d] Although there is no standard for immediate perioperative intravesical chemotherapy, mitomycin is most commonly used.
[e] The modifier "c" refers to clinical staging based on bimanual examination under anesthesia, endoscopic surgery (biopsy or transurethral resection), and imaging studies. The modifier "p" refers to pathologic staging based on cystectomy and lymph node dissection.

Note: All recommendations are category 2A unless otherwise indicated.
Clinical Trials: NCCN believes that the best management of any patient with cancer is in a clinical trial. Participation in clinical trials is especially encouraged.

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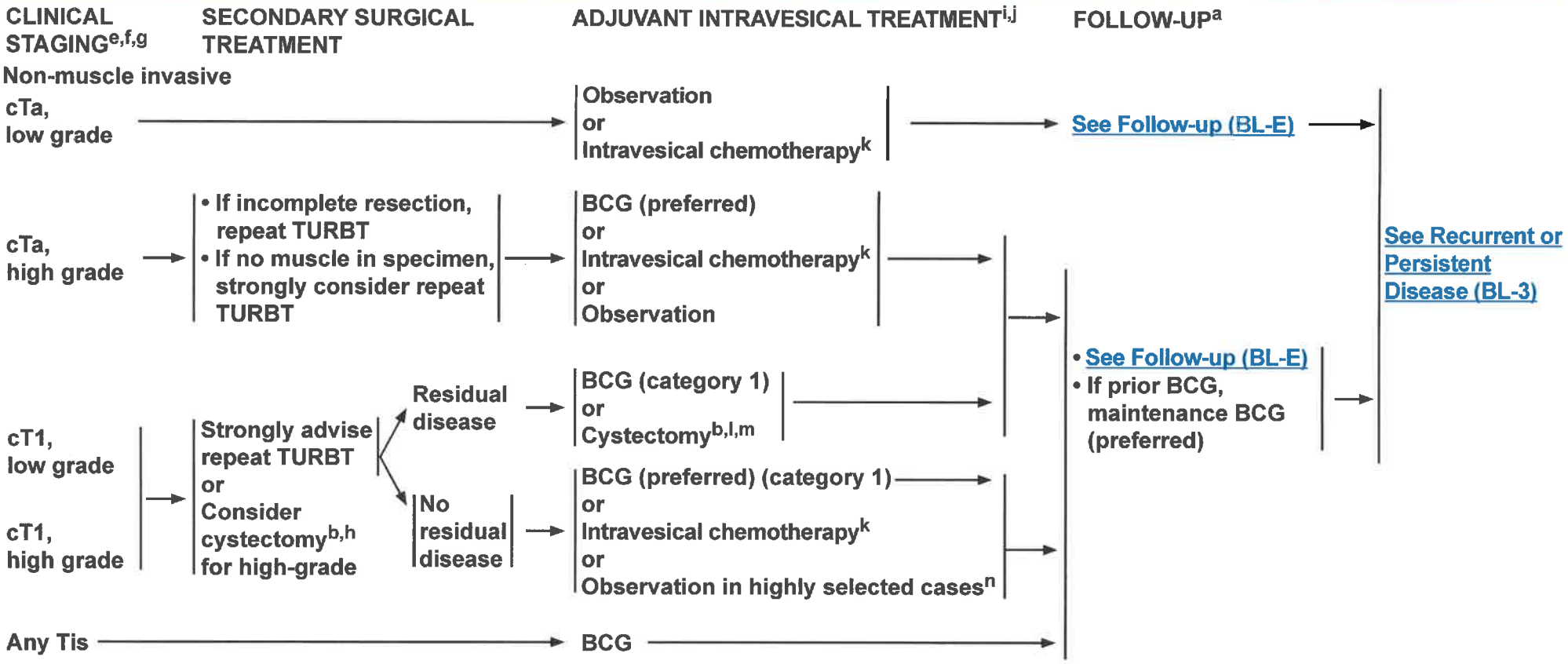
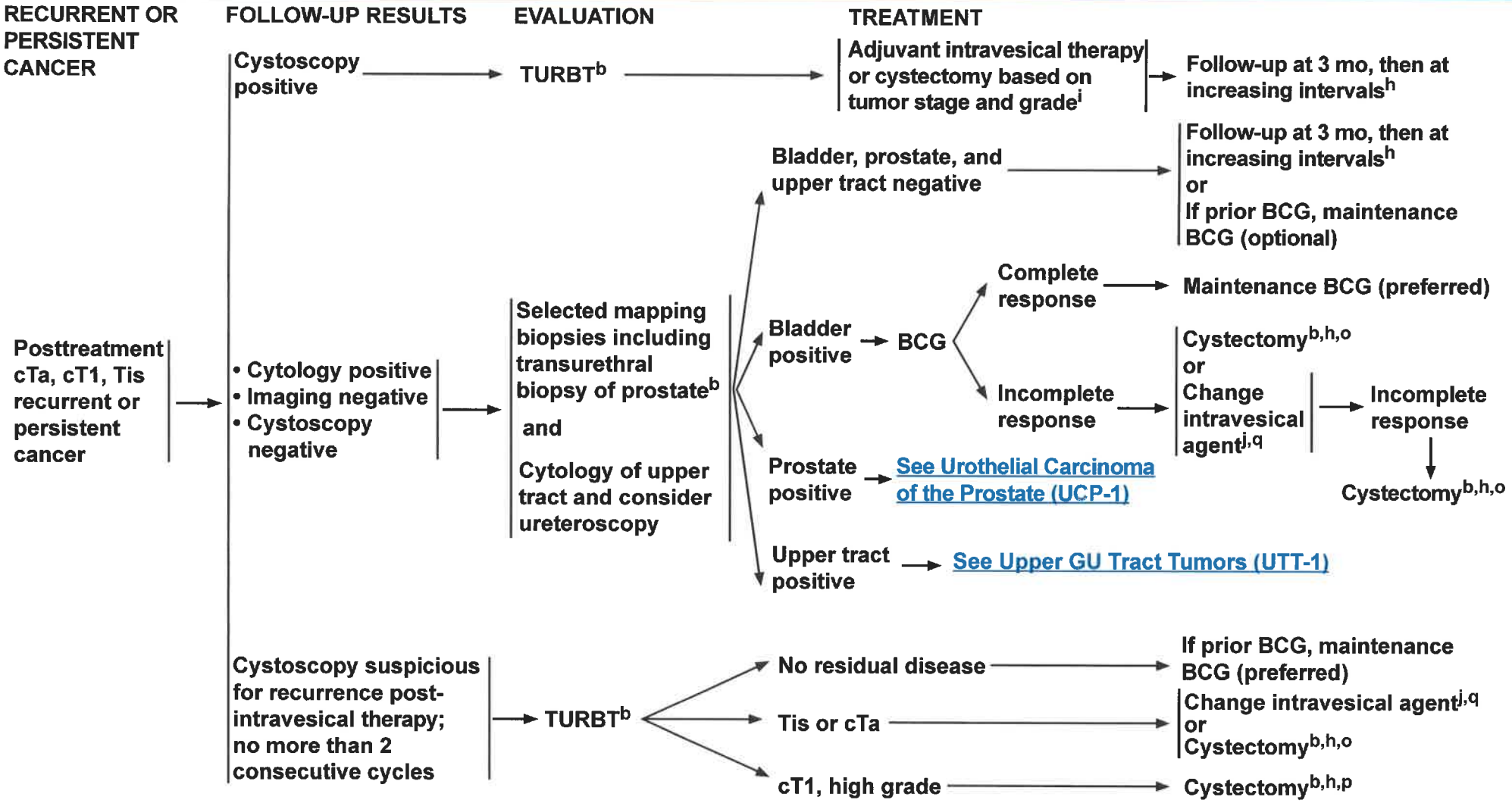


[a] See Principles of Imaging for Bladder/Urothelial Cancer (BL-A).
[b] See Principles of Surgical Management (BL-B).
[e] The modifier "c" refers to clinical staging based on bimanual examination under anesthesia, endoscopic surgery (biopsy or transurethral resection), and imaging studies. The modifier "p" refers to pathologic staging based on cystectomy and lymph node dissection.
[f] Montironi R, Lopez-Beltran A. The 2004 WHO classification of bladder tumors: A summary and commentary. Int J Surg Pathol 2005;13:143-153. See Principles of Pathology Management (BL-C).
[g] See Non-Urothelial Cell Carcinoma of the Bladder (BL-D).
[h] See Follow-Up (BL-E).
[i] Indications for adjuvant induction therapy: Based on probability of recurrence and progression to muscle-invasive disease, such as size, number, and grade.
[j] See Principles of Intravesical Treatment (BL-F).
[k] The most commonly used options for intravesical chemotherapy are mitomycin and gemcitabine.
[l] If not a cystectomy candidate, consider concurrent chemoradiotherapy (category 2B) or a clinical trial. See Principles of Systemic Therapy (BL-G 4 of 5).
[m] Cystectomy is generally reserved for residual T1, high-grade, and muscle-invasive disease at re-resection.
[n] Highly selected cases with small-volume tumors with limited lamina propria invasion and no CIS.

Note: All recommendations are category 2A unless otherwise indicated.
Clinical Trials: NCCN believes that the best management of any patient with cancer is in a clinical trial. Participation in clinical trials is especially encouraged.



[b] See Principles of Surgical Management (BL-B).
[h] See Follow-Up (BL-E).
[i] Indications for adjuvant induction therapy: Based on probability of recurrence and progression to muscle-invasive disease, such as size, number, and grade.
[j] See Principles of Intravesical Treatment (BL-F).
[o] If not a cystectomy candidate, consider concurrent chemoradiotherapy (category 2B) or a clinical trial. See Principles of Systemic Therapy (BL-G 4 of 5).
[p] If not a cystectomy candidate, consider concurrent chemoradiotherapy (see Principles of Systemic Therapy [BL-G 4 of 5]), change in intravesical agent, or a clinical trial.
[q] Valrubicin is approved for BCG-refractory carcinoma in situ.

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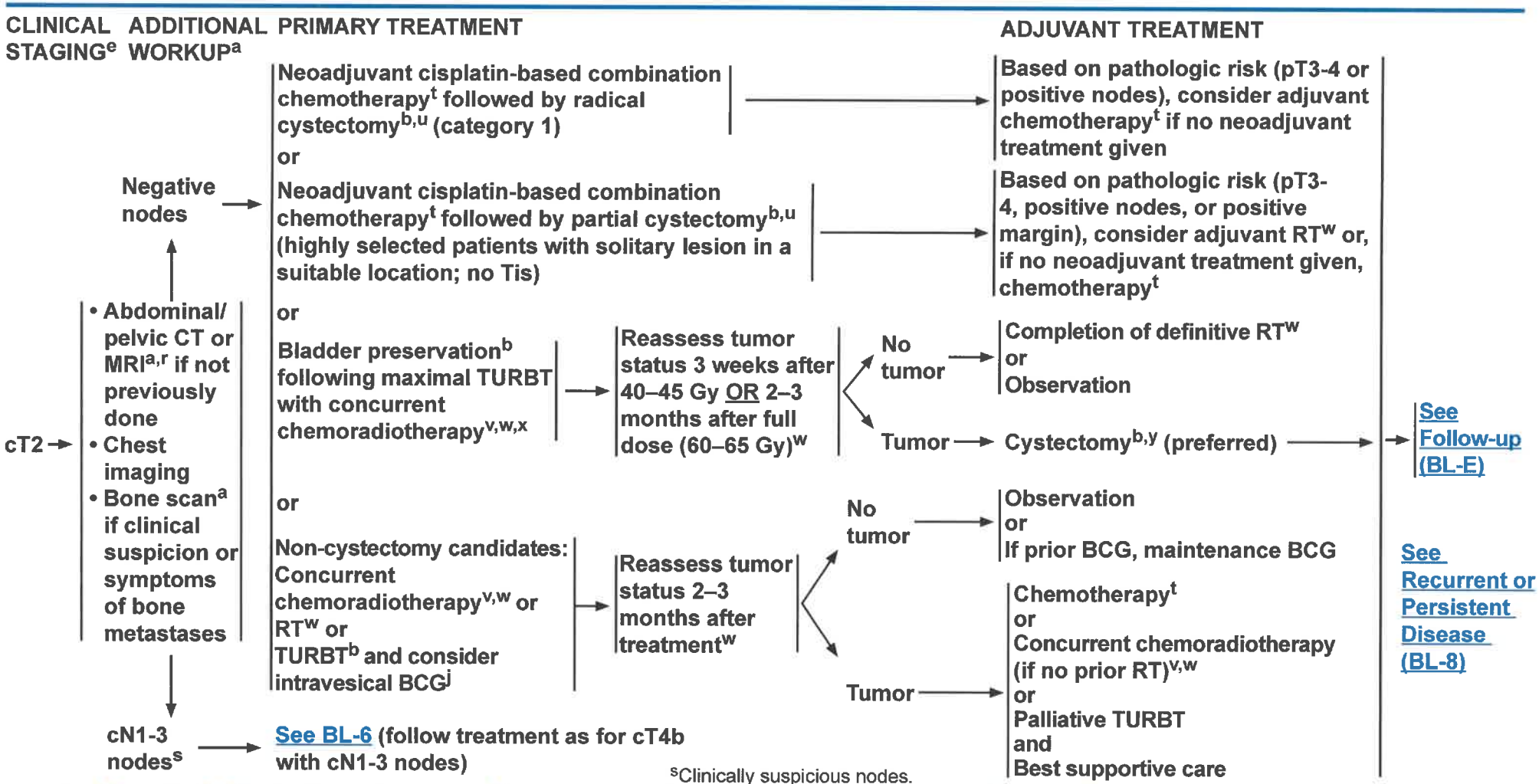
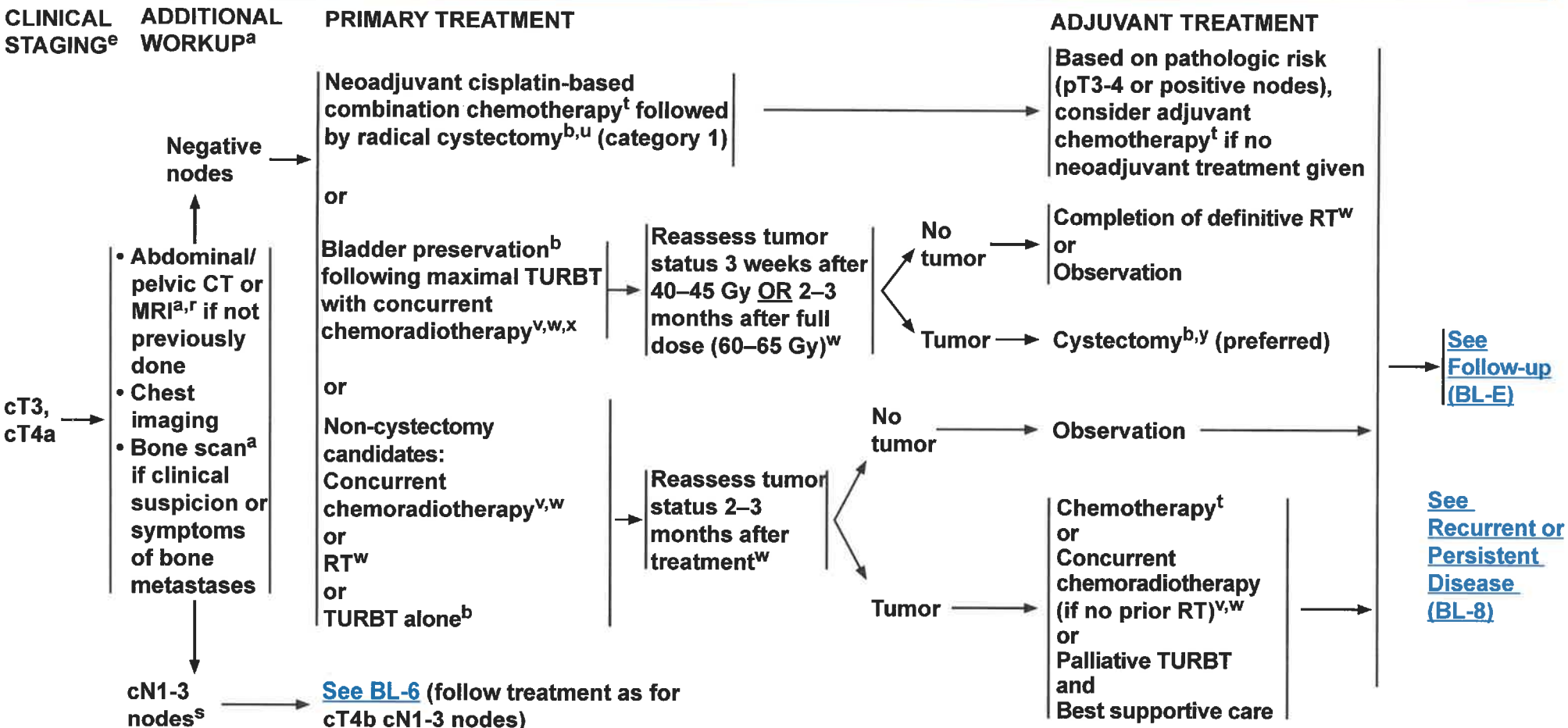


[a] See Principles of Imaging for Bladder/Urothelial Cancer (BL-A).
[b] See Principles of Surgical Management (BL-B).
[e] The modifier "c" refers to clinical staging based on bimanual examination under anesthesia, endoscopic surgery (biopsy or transurethral resection), and imaging studies. The modifier "p" refers to pathologic staging based on cystectomy and lymph node dissection.
[j] See Principles of Intravesical Treatment (BL-F).
[r] Consider PET/CT scan (skull base to mid-thigh) (category 2B).
[s] Clinically suspicious nodes.
[t] See Principles of Systemic Therapy (BL-G 1 of 5).
[u] Cystectomy alone is appropriate for those not eligible to receive cisplatin-based chemotherapy.
[v] See Principles of Systemic Therapy (BL-G 4 of 5).
[w] See Principles of Radiation Management of Invasive Disease (BL-H).
[x] There are data to support equivalent survival rates. Not all institutions have experience with these multidisciplinary treatment approaches, which require a dedicated team.
[y] Other options may include TURBT, best supportive care, or observation depending on patient and tumor characteristics.

Note: All recommendations are category 2A unless otherwise indicated.
Clinical Trials: NCCN believes that the best management of any patient with cancer is in a clinical trial. Participation in clinical trials is especially encouraged.



[a] See Principles of Imaging for Bladder/Urothelial Cancer (BL-A).
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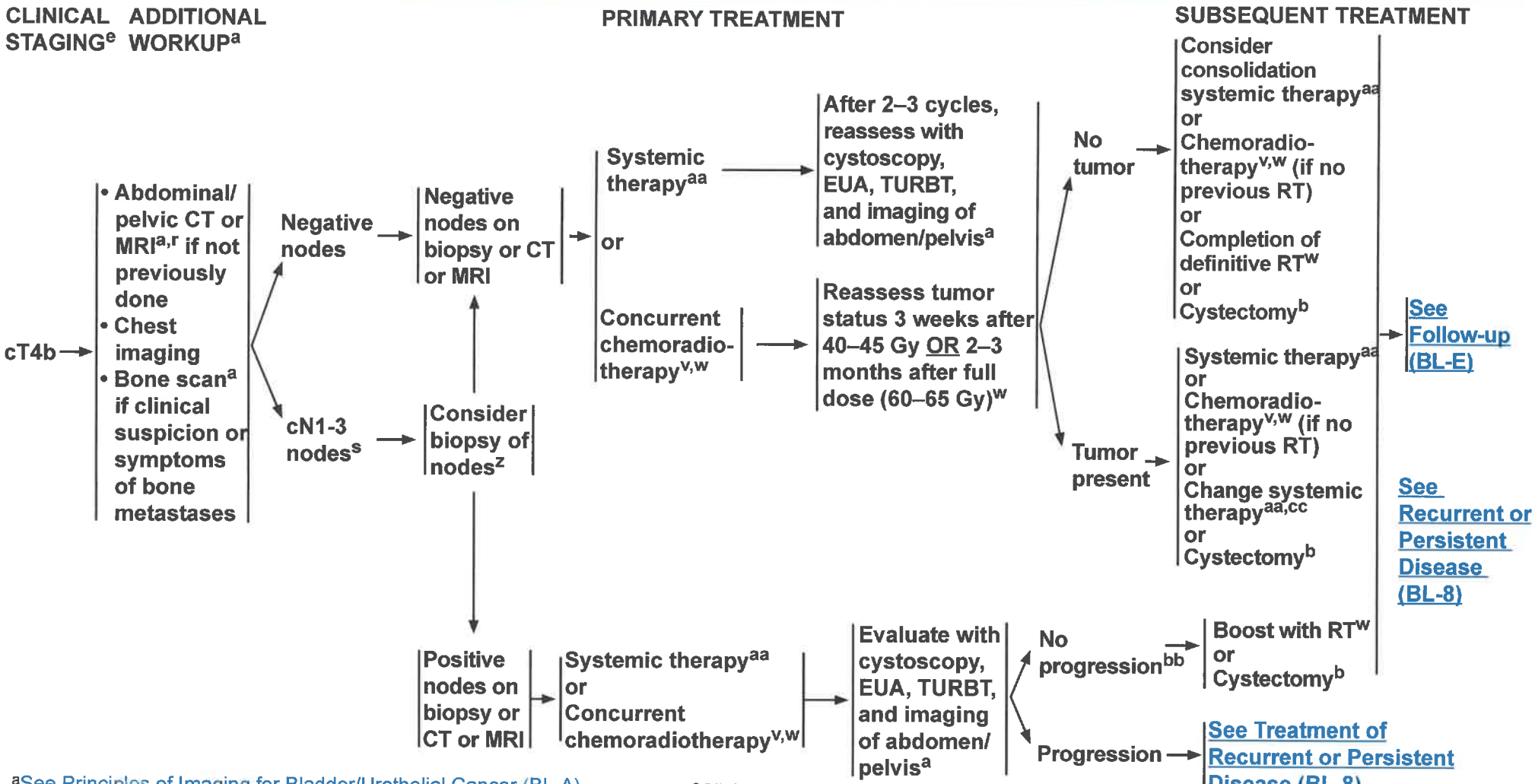
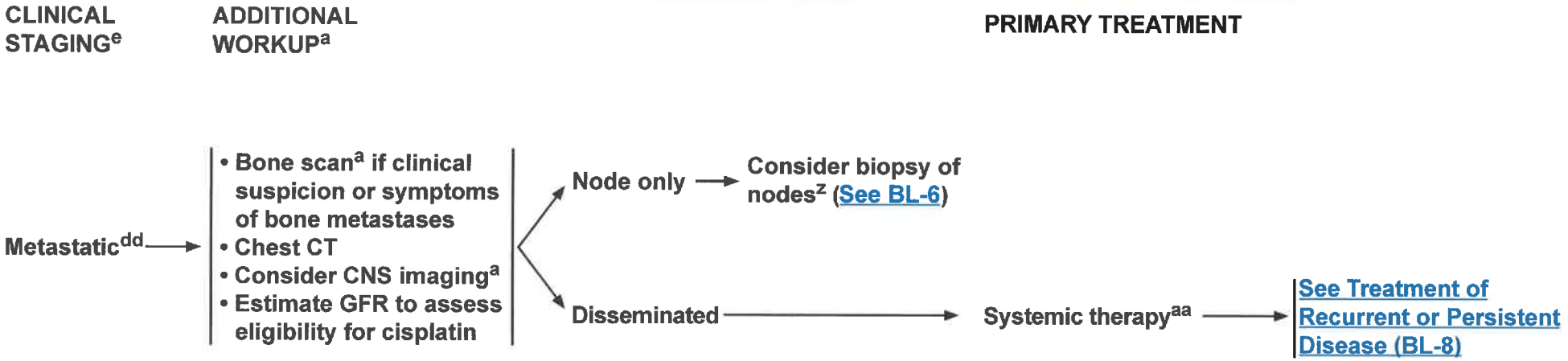


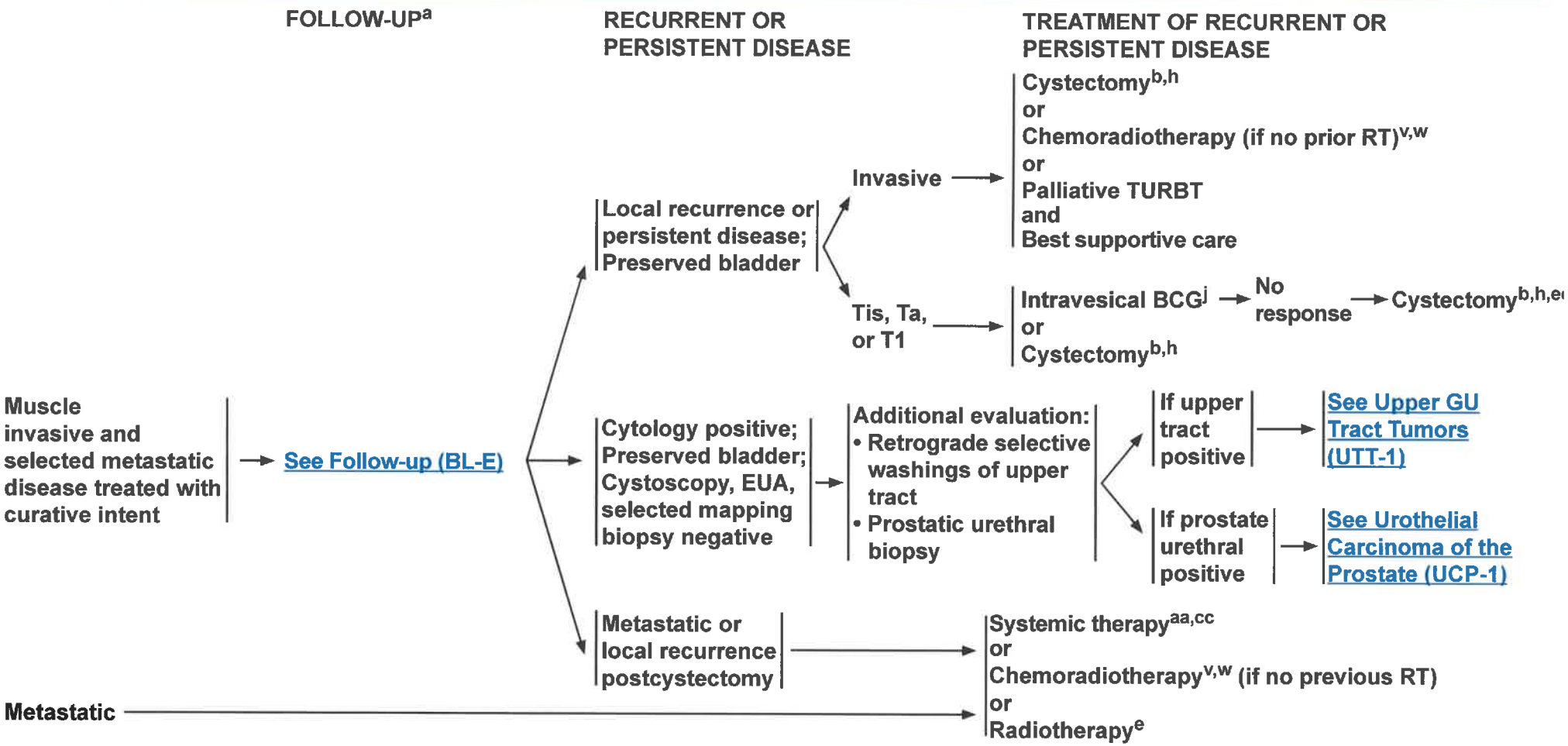
[a] See Principles of Imaging for Bladder/Urothelial Cancer (BL-A).
[b] See Principles of Surgical Management (BL-B).
[e] The modifier "c" refers to clinical staging based on bimanual examination under anesthesia, endoscopic surgery (biopsy or transurethral resection), and imaging studies. The modifier "p" refers to pathologic staging based on cystectomy and lymph node dissection.
[r] Consider PET/CT scan (skull base to mid-thigh) (category 2B).
[s] Clinically suspicious nodes.
[v] See Principles of Systemic Therapy (BL-G 4 of 5).
[w] See Principles of Radiation Management of Invasive Disease (BL-H).
[z] If technically possible.
[aa] See Principles of Systemic Therapy (BL-G 2 of 5).
[bb] Non-bulky disease and no significant clinical progression.
[cc] See Principles of Systemic Therapy (BL-G 3 of 5).

Note: All recommendations are category 2A unless otherwise indicated.
Clinical Trials: NCCN believes that the best management of any patient with cancer is in a clinical trial. Participation in clinical trials is especially encouraged.



[a] See Principles of Imaging for Bladder/Urothelial Cancer (BL-A).
[e] The modifier "c" refers to clinical staging based on bimanual examination under anesthesia, endoscopic surgery (biopsy or transurethral resection), and imaging studies. The modifier "p" refers to pathologic staging based on cystectomy and lymph node dissection.
[z] If technically possible.
[aa] See Principles of Systemic Therapy (BL-G 2 of 5).
[dd] Consider molecular testing in a CLIA-approved laboratory. See Discussion.

Note: All recommendations are category 2A unless otherwise indicated.
Clinical Trials: NCCN believes that the best management of any patient with cancer is in a clinical trial. Participation in clinical trials is especially encouraged.



[a] See Principles of Imaging for Bladder/Urothelial Cancer (BL-A).
[b] See Principles of Surgical Management (BL-B).
[h] See Follow-Up (BL-E).
[j] See Principles of Intravesical Treatment (BL-F).
[v] See Principles of Systemic Therapy (BL-G 4 of 5).
[w] See Principles of Radiation Management of Invasive Disease (BL-H).
[aa] See Principles of Systemic Therapy (BL-G 2 of 5).
[cc] See Principles of Systemic Therapy (BL-G 3 of 5).
[ee] If not a cystectomy candidate, consider concurrent chemoradiotherapy (See BL-G 4 of 5) (if no prior RT), change in intravesical agent, or a clinical trial.

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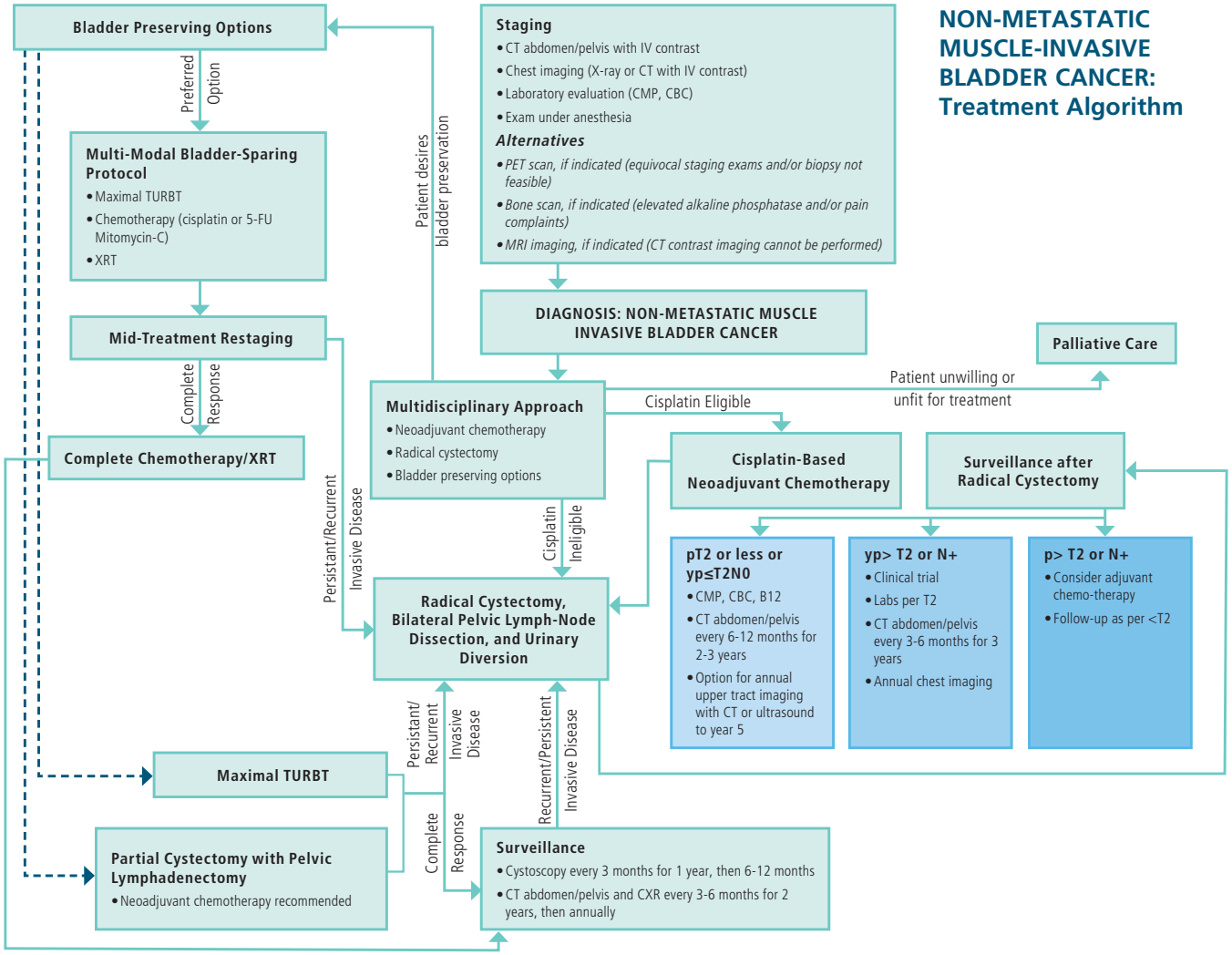
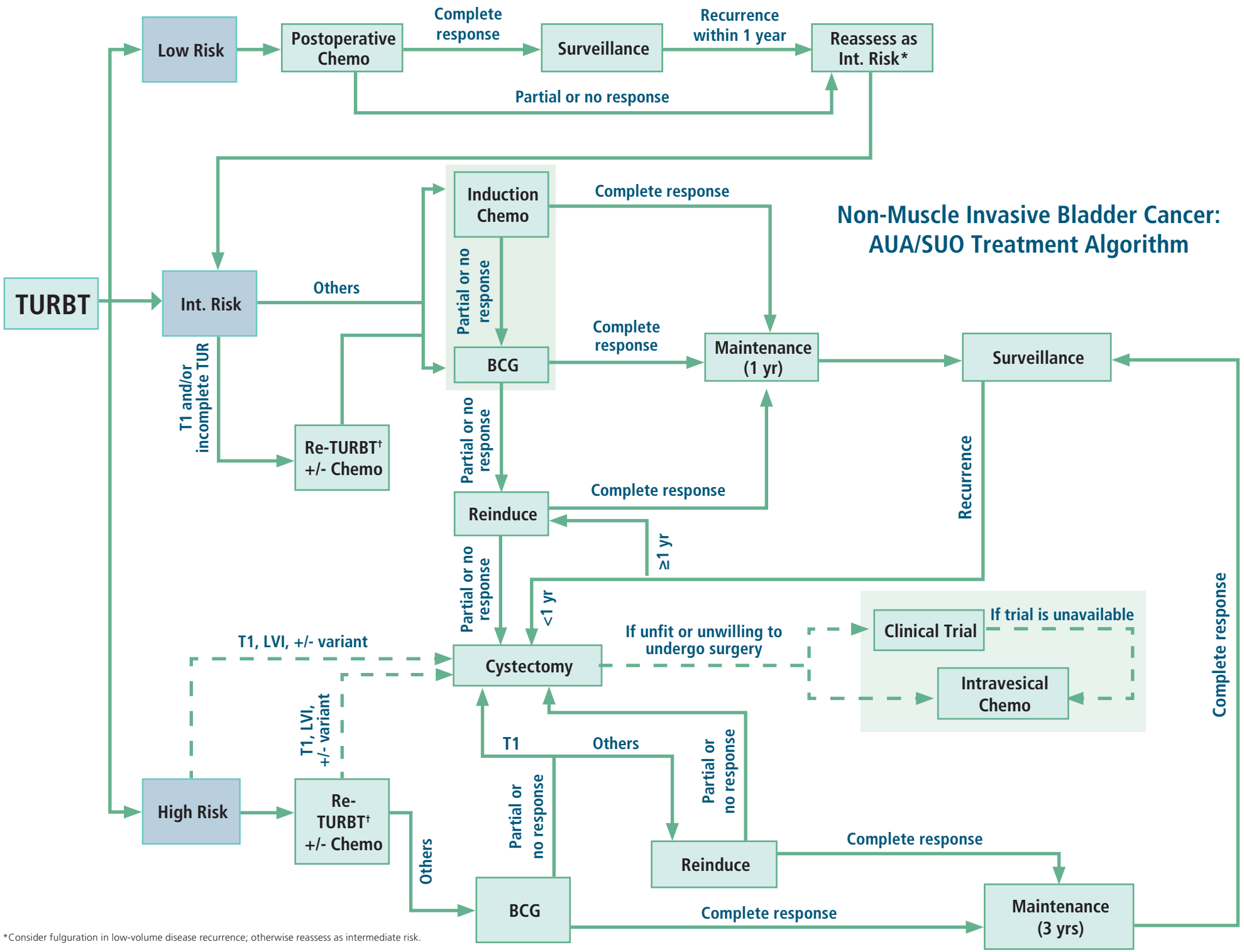
Clinical Trials: NCCN believes that the best management of any patient with cancer is in a clinical trial. Participation in clinical trials is especially encouraged.

NON-METASTATIC MUSCLE-INVASIVE BLADDER CANCER: Treatment Algorithm



CBC= complete blood count; CMP= comprehensive metabolic panel; CXR= chest X-ray; p= pathologic stage; TURBT=trans-urethral resection of bladder tumor; XRT= external beam radiation therapy; yp= pathologic stage after neoadjuvant chemotherapy

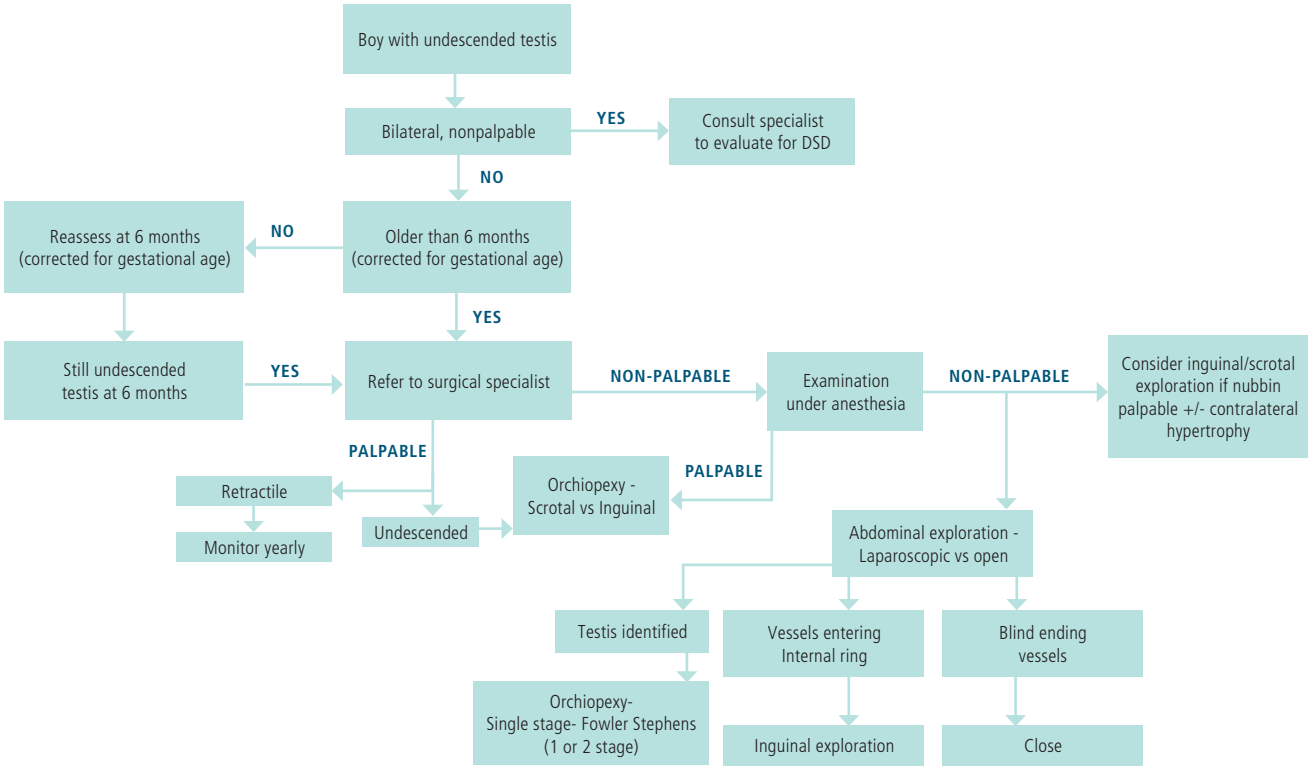


*Consider fulguration in low-volume disease recurrence; otherwise reassess as intermediate risk.

†Timely re-TURBT (within six weeks) should be performed if there are concerns regarding an incomplete resection and/or if bladder sparing treatment (e.g., intravesical therapy or surveillance), is being planned.

FIGURE 1.

Evaluation and Treatment of Cryptorchidism



Interstitial Cystitis / Bladder Pain Syndrome

IC/BPS

An unpleasant sensation (pain, pressure, discomfort) perceived to be related to the urinary bladder, associated with lower urinary tract symptoms of more than six weeks duration, in the absence of infection or other identifiable causes

BASIC ASSESSMENT

- History
- Frequency/Volume Chart
- Post-void residual
- Physical examination
- Urinalysis, culture
- Cytology if smoking hx
- Symptom questionnaire
- Pain evaluation

Confirmed or Uncomplicated IC/BPS

Signs/Symptoms of Complicated IC/BPS

- Incontinence/OAB
- GI signs/symptoms Microscopic/gross hematuria/sterile pyuria
- Gynecologic signs/symptoms

CONSIDER:

- Urine cytology
- Imaging
- Cystoscopy
- Urodynamics
- Laparoscopy
- Specialist referral (urologic or non-urologic as appropriate)

Dx Urinary Tract Infection

TREAT & REASSESS

CLINICAL MANAGEMENT PRINCIPLES

- Treatments are ordered from most to least conservative; surgical treatment is appropriate only after other treatment options have been found to be ineffective (except for treatment of Hunner's lesions if detected)
- Initial treatment level depends on symptom severity, clinician judgment, and patient preferences
- Multiple, simultaneous treatments may be considered if in best interests of patient
- Ineffective treatments should be stopped
- Pain management should be considered throughout course of therapy with goal of maximizing function and minimizing pain and side effects
- Diagnosis should be reconsidered if no improvement within clinically-meaningful time-frame

FIRST-LINE TREATMENTS

- General Relaxation/ Stress Management
- Pain Management
- Patient Education
- Self-care/Behavioral Modification

SECOND-LINE TREATMENTS

- Appropriate manual physical therapy techniques
- Oral: amitriptyline, cimetidine, hydroxyzine, PPS
- Intravesical: DMSO, Heparin, Lidocaine
- Pain Management

THIRD-LINE TREATMENTS

- Cystoscopy under anesthesia w/ hydrodistention
- Pain Management
- Tx of Hunner's lesions if found

FOURTH-LINE TREATMENTS

- Intradetrusor botulinum toxin A
- Neuromodulation
- Pain Management

FIFTH-LINE TREATMENTS

- Cyclosporine A
- Pain Management

SIXTH-LINE TREATMENTS

- Diversion w/ or w/out cystectomy
- Pain Management
- Substitution cystoplasty

Note: For patients with end-stage structurally small bladders, diversion is indicated at any time clinician and patient believe appropriate.

RESEARCH TRIALS

Patient enrollment as appropriate at any point in treatment process

The evidence supporting the use of Neuromodulation, Cyclosporine A, and BTX for IC/BPS is limited by many factors including study quality, small sample sizes, and lack of durable follow up. None of these therapies have been approved by the U.S. Food and Drug Administration for this indication. The panel believes that none of these interventions can be recommended for generalized use for this disorder, but rather should be limited to practitioners with experience managing this syndrome and willingness to provide long term care of these patients post intervention.

NCCN Guidelines Version 2.2018
Kidney Cancer

NCCN Guidelines Index
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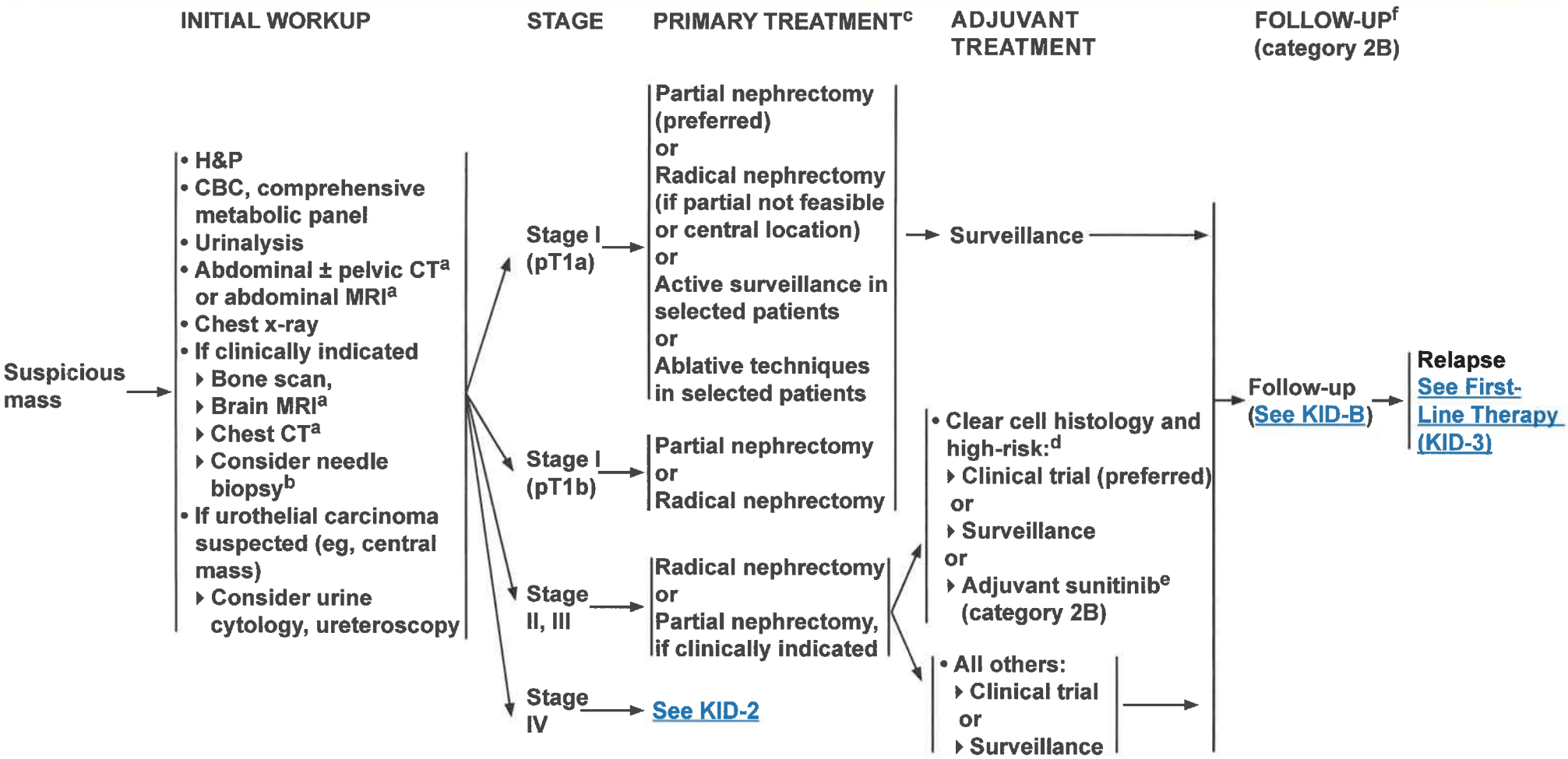

[a]Imaging with contrast when clinically indicated.
[b]Biopsy of small lesions may be considered to obtain or confirm a diagnosis of malignancy and guide surveillance, cryosurgery, and radiofrequency ablation strategies.
[c]See Principles of Surgery (KID-A).
[d]High-risk defined as: tumor stage 3 or higher, regional lymph-node metastasis, or both.
[e]Dosing of adjuvant sunitinib: 50 mg per day - 4 weeks on, 2 weeks off for 1 year.
[f]No single follow-up plan is appropriate for all patients. Follow-up should be individualized based on patient requirements.

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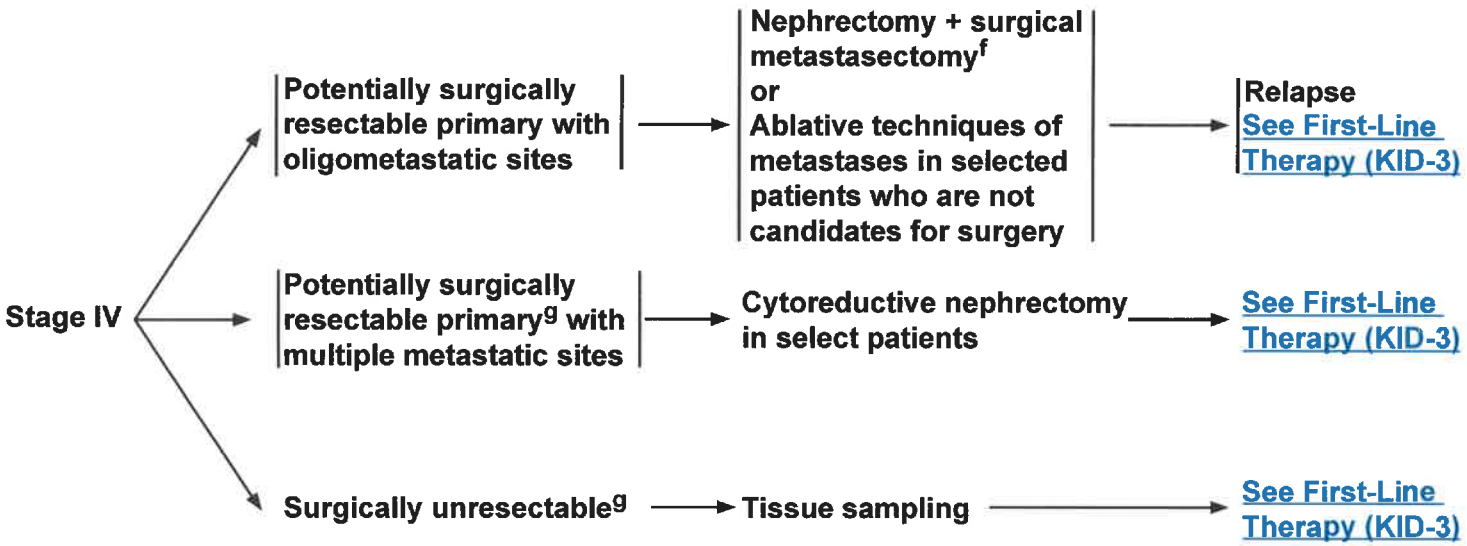

[c] See Principles of Surgery (KID-A).
[f] No single follow-up plan is appropriate for all patients. Follow-up should be individualized based on patient requirements.
[g] Individualize treatment based on symptoms and extent of metastatic disease.

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FIRST-LINE THERAPY
(alphabetical by category and preference)

Relapse or Stage IV and surgically unresectable

Predominant clear cell histology →

- Clinical trial
- Pazopanib (category 1, preferred)
- Sunitinib (category 1, preferred)
- Bevacizumab + interferon alfa-2b (category 1)
- Temsirolimus (category 1 for poor-prognosis patients,[h] category 2B for selected patients of other risk groups)
- Axitinib
- Cabozantinib (for poor- and intermediate-risk groups)[i]
- High-dose IL-2 for selected patients[j]
- Active surveillance for select, asymptomatic patients[k]

and
Best supportive care:[l]
See NCCN Guidelines for Palliative Care

→ Follow-up (See KID-B) → See Subsequent Therapy for Predominant Clear Cell Histology (KID-4)

Non-clear cell histology → See Systemic Therapy (KID-5)

[h] See Risk Models to Direct Treatment (Predictors of Short Survival Used to Select Patients for Temsirolimus) (KID-C).
[i] See Risk Models to Direct Treatment (IMDC criteria) (KID-C).
[j] Patients with excellent performance status and normal organ function.
[k] Rini BI, Dorff TB, Elson P, et al. Active surveillance in metastatic renal-cell carcinoma: a prospective, phase 2 trial. Lancet Oncol 2017;17:1317-1324.
[l] Best supportive care can include palliative RT, metastasectomy, ablative techniques for oligometastatic disease, bisphosphonates, or RANK ligand inhibitors for bony metastases.

Note: All recommendations are category 2A unless otherwise indicated.
Clinical Trials: NCCN believes that the best management of any patient with cancer is in a clinical trial. Participation in clinical trials is especially encouraged.

Relapse or Stage IV and surgically unresectable → **Predominant clear cell histology** →

SUBSEQUENT THERAPY[m]
(alphabetical by category and preference)

- **Clinical trial**
- **Cabozantinib (category 1, preferred)[n]**
- **Nivolumab (category 1, preferred)[n]**
- **Axitinib (category 1)**
- **Lenvatinib + everolimus (category 1)**
- **Everolimus**
- **Pazopanib**
- **Sorafenib**
- **Sunitinib**
- **Bevacizumab (category 2B)**
- **High-dose IL-2 for selected patients[j] (category 2B)**
- **Temsirolimus (category 2B)**

and
Best supportive care:[l]
See NCCN Guidelines for Palliative Care

[j]Patients with excellent performance status and normal organ function.
[l]Best supportive care can include palliative RT, metastasectomy, ablative techniques for oligometastatic disease, bisphosphonates, or RANK ligand inhibitors for bony metastases.
[m]In clear cell and non-clear cell RCC with predominant sarcomatoid features, gemcitabine + doxorubicin (category 2B) and gemcitabine + sunitinib (category 2B) have shown benefit.
[n]Based on the results of phase III trials, eligible patients should preferentially receive this agent over everolimus. See Discussion.

Note: All recommendations are category 2A unless otherwise indicated.
Clinical Trials: NCCN believes that the best management of any patient with cancer is in a clinical trial. Participation in clinical trials is especially encouraged.

SYSTEMIC THERAPY[m,o]
(alphabetical by category and preference)

Relapse or Stage IV and surgically unresectable → **Non-clear cell histology** →

- **Clinical trial (preferred)**
- **Sunitinib (preferred)**
- **Axitinib**
- **Bevacizumab**
- **Bevacizumab + erlotinib for selected patients with advanced papillary RCC including HLRCC**
- **Bevacizumab + everolimus for selected patients with advanced papillary RCC including HLRCC**
- **Cabozantinib**
- **Erlotinib**
- **Everolimus**
- **Lenvatinib + everolimus**
- **Nivolumab**
- **Pazopanib**
- **Sorafenib**
- **Temsirolimus (category 1 for poor-prognosis patients;[h] category 2A for other risk groups)**

and
Best supportive care:[l] See NCCN Guidelines for Palliative Care

→ **Follow-up (See KID-B)**

HLRCC: Hereditary leiomyomatosis and renal cell cancer

[h] See Risk Models to Direct Treatment (Predictors of Short Survival Used to Select Patients for Temsirolimus) (KID-C).
[l] Best supportive care can include palliative RT, metastasectomy, ablative techniques for oligometastatic disease, bisphosphonates, or RANK ligand inhibitors for bony metastases.
[m] In clear cell and non-clear cell RCC with predominant sarcomatoid features, gemcitabine + doxorubicin (category 2B) and gemcitabine + sunitinib (category 2B) have shown benefit.
[o] Partial responses have been observed for cytotoxic chemotherapy (carboplatin + gemcitabine, carboplatin + paclitaxel, or cisplatin + gemcitabine) with collecting duct or medullary subtypes.

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Clinical Trials: NCCN believes that the best management of any patient with cancer is in a clinical trial. Participation in clinical trials is especially encouraged.

Approved by the AUA Board of Directors April 2017

Authors' disclosure of potential conflicts of interest and author/staff contributions appear at the end of the article.

American Urological Association (AUA) / American Society for Radiation Oncology (ASTRO) / Society of Urologic Oncology (SUO)

CLINICALLY LOCALIZED PROSTATE CANCER: AUA/ASTRO/SUO GUIDELINE

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Purpose

Following a prostate cancer diagnosis, patients are faced with a multitude of care options, the advisability of which is influenced by patient factors and by cancer severity or aggressiveness. The ability to categorize patients based on cancer aggressiveness is invaluable for facilitating care decisions. Accordingly, these guidelines for the management of localized prostate cancer are structured first, to provide a clinical framework stratified by cancer severity (or risk group) to facilitate care decisions and second, to guide the specifics of implementing the selected management options, including active surveillance, observation/watchful waiting, prostatectomy, radiotherapy, cryosurgery, high intensity focused ultrasound (HIFU) and focal therapy. Secondary or salvage treatment for localized prostate cancer that persists or recurs after primary definitive intervention, and primary treatment of locally advanced/metastatic disease, are outside the scope of these guidelines. The content of these guidelines is formatted as shown in Table 1.

Methodology

The systematic review utilized in the creation of this guideline was completed in part through the Agency for Healthcare Research and Quality (AHRQ) and through additional supplementation that further addressed additional key questions and more recently published literature. A research librarian experienced in conducting literature searches for comparative effectiveness reviews searched in MEDLINE®, PreMEDLINE, Embase®, the Cochrane Library, the Database of Abstracts of Reviews of Effects, the Health Technology Assessment Database, and the UK National Health Service Economic Evaluation database to capture literature published from January 1, 2007 through March 7, 2014. Additional supplemental searches were conducted adding additional literature in August 2015 and August 2016. The AUA categorizes body of evidence strength as Grade A (well-conducted and highly-generalizable randomized controlled trials [RCTs] or exceptionally strong observational studies with consistent findings), Grade B (RCTs with some weaknesses of procedure or generalizability or moderately strong observational studies with consistent findings), or Grade C (RCTs with serious deficiencies of procedure or generalizability or extremely small sample sizes or observational studies that are inconsistent, have small sample sizes, or have other problems that potentially confound interpretation of data). When sufficient evidence existed, the body of evidence for a particular treatment was assigned a strength rating of A (high), B (moderate) or C (low) for support of Strong, Moderate, or Conditional Recommendations. In the absence of sufficient evidence, additional information is provided as Clinical Principles and Expert Opinions.

Table 1. Localized Prostate Cancer Guidelines Content

Section	Subtopic	Guideline Statements
I. Introduction		NA
	A. Guideline Statements	
	B. Methodology	
	C. Risk Stratification	
II. Shared Decision Making		1-5
III. Care Options by Cancer Severity/ Risk Group		6-27
	A. Very Low / Low Risk	6-14
	B. Intermediate Risk	15-21
	C. High Risk	22-27
IV. Recommended Approaches/Details of Specific Care Options		28-60
	A. Active Surveillance	28-33
	B. Radical Prostatectomy	34-41
	C. Radiotherapy	42-49
	D. Cryosurgery	50-56
	E. HIFU/Focal therapy	57-60
V. Outcome Expectations and Manage-ment		
	A. Side effects and HRQOL	61-65
	B. Post-treatment follow-up	66-68
VI. Future Directions		NA

INTRODUCTION

GUIDELINE STATEMENTS

SHARED DECISION MAKING (SDM)

1. Counseling of patients to select a management strategy for localized prostate cancer should incorporate shared decision making and explicitly consider cancer severity (risk category), patient values and preferences, life expectancy, pre-treatment general functional and genitourinary symptoms, expected post-treatment functional status, and potential for salvage treatment. (Strong Recommendation; Evidence Level: Grade A)
2. Prostate cancer patients should be counseled regarding the importance of modifiable health-related behaviors or risk factors, such as smoking and obesity. (Expert Opinion)
3. Clinicians should encourage patients to meet with different prostate cancer care specialists (e.g., urology and either radiation oncology or medical oncology or both), when possible to promote informed decision making. (Moderate Recommendation; Evidence Level: Grade B)
4. Effective shared decision making in prostate cancer care requires clinicians to inform patients about immediate and long-term morbidity or side effects of proposed treatment or care options. (Clinical Principle)
5. Clinicians should inform patients about suitable clinical trials and encourage patients to consider participation in such trials based on eligibility and access. (Expert Opinion)

CARE OPTIONS BY CANCER SEVERITY/RISK GROUP

Very Low-/Low-Risk Disease

6. Clinicians should not perform abdomino-pelvic CT or routine bone scans in the staging of asymptomatic very low- or low-risk localized prostate cancer patients. (Strong Recommendation; Evidence Level: Grade C)
7. Clinicians should recommend active surveillance as the best available care option for very low-risk localized prostate cancer patients. (Strong Recommendation; Evidence Level: Grade A)
8. Clinicians should recommend active surveillance as the preferable care option for most low-risk localized prostate cancer patients. (Moderate Recommendation; Evidence Level: Grade B)
9. Clinicians may offer definitive treatment (i.e. radical prostatectomy or radiotherapy) to select low-risk localized prostate cancer patients who may have a high probability of progression on active surveillance. (Conditional Recommendation; Evidence Level: Grade B)
10. Clinicians should not add ADT along with radiotherapy for low-risk localized prostate cancer with the exception of reducing the size of the prostate for brachytherapy. (Strong Recommendation; Evidence Level: Grade B)
11. Clinicians should inform low-risk prostate cancer patients considering whole gland cryosurgery that consequent side effects are considerable and survival benefit has not been shown in comparison to active surveillance. (Conditional Recommendation; Evidence Level: Grade C)
12. Clinicians should inform low-risk prostate cancer patients who are considering focal therapy or high intensity focused ultrasound (HIFU) that these interventions are not standard care options because comparative outcome evidence is lacking. (Expert Opinion)
13. Clinicians should recommend observation or watchful waiting for men with a life expectancy ≤5 years with low-risk localized prostate cancer. (Strong Recommendation; Evidence Level: Grade B)
14. Among most low-risk localized prostate cancer patients, tissue based genomic biomarkers have not shown a clear role in the selection of candidates for active surveillance. (Expert Opinion)

Intermediate-Risk Disease

15. Clinicians should consider staging unfavorable intermediate-risk localized prostate cancer patients with cross sectional imaging (CT or MRI) and bone scan. (Expert Opinion)
16. Clinicians should recommend radical prostatectomy or radiotherapy plus androgen deprivation therapy (ADT) as standard treatment options for patients with intermediate-risk localized prostate cancer. (Strong Recommendation; Evidence Level: Grade A)
17. Clinicians should inform patients that favorable intermediate-risk prostate cancer can be treated with radiation

alone, but that the evidence basis is less robust than for combining radiotherapy with ADT. (Moderate Recommendation; Evidence Level: Grade B)

18. In select patients with intermediate-risk localized prostate cancer, clinicians may consider other treatment options such as cryosurgery. (Conditional Recommendation; Evidence Level: Grade C)
19. Active surveillance may be offered to select patients with favorable intermediate-risk localized prostate cancer; however, patients should be informed that this comes with a higher risk of developing metastases compared to definitive treatment. (Conditional Recommendation; Evidence Level: Grade C)
20. Clinicians should recommend observation or watchful waiting for men with a life expectancy ≤5 years with intermediate-risk localized prostate cancer. (Strong Recommendation; Evidence Level: Grade A)
21. Clinicians should inform intermediate-risk prostate cancer patients who are considering focal therapy or HIFU that these interventions are not standard care options because comparative outcome evidence is lacking. (Expert Opinion)

High-Risk Disease

22. Clinicians should stage high-risk localized prostate cancer patients with cross sectional imaging (CT or MRI) and bone scan. (Clinical Principle)
23. Clinicians should recommend radical prostatectomy or radiotherapy plus ADT as standard treatment options for patients with high-risk localized prostate cancer. (Strong Recommendation; Evidence Level: Grade A)
24. Clinicians should not recommend active surveillance for patients with high-risk localized prostate cancer. Watchful waiting should only be considered in asymptomatic men with limited life expectancy (≤5 years). (Moderate Recommendation; Evidence Level: Grade C)
25. Cryosurgery, focal therapy and HIFU treatments are not recommended for men with high-risk localized prostate cancer outside of a clinical trial. (Expert Opinion)
26. Clinicians should not recommend primary ADT for patients with high-risk localized prostate cancer unless the patient has both limited life expectancy and local symptoms. (Strong Recommendation; Evidence Level: Grade A)
27. Clinicians may consider referral for genetic counseling for patients (and their families) with high-risk localized prostate cancer and a strong family history of specific cancers (e.g., breast, ovarian, pancreatic, other gastrointestinal tumors, lymphoma). (Expert Opinion)

RECOMMENDED APPROACHES AND DETAILS OF SPECIFIC CARE OPTIONS

Active Surveillance

28. Localized prostate cancer patients who elect active surveillance should have accurate disease staging including systematic biopsy with ultrasound or MRI-guided imaging. (Clinical Principle)
29. Localized prostate cancer patients undergoing active surveillance should have routine surveillance PSA testing and digital rectal exams. (Strong Recommendation; Evidence Level: Grade B)
30. Localized prostate cancer patients undergoing active surveillance should be encouraged to have a confirmatory biopsy within the initial two years and surveillance biopsies thereafter. (Clinical Principle)
31. Clinicians may consider multiparametric prostate MRI as a component of active surveillance for localized prostate cancer patients. (Expert Opinion)
32. Tissue based genomic biomarkers have not shown a clear role in active surveillance for localized prostate cancer and are not necessary for follow up. (Expert Opinion)
33. Clinicians should offer definitive treatment to localized prostate cancer patients undergoing active surveillance who develop adverse reclassification. (Moderate Recommendation; Evidence Level: Grade B)

Prostatectomy

34. Clinicians should inform localized prostate cancer patients that younger or healthier men (e.g., <65 years of age or >10 year life expectancy) are more likely to experience cancer control benefits from prostatectomy than older

men. (Strong Recommendation; Evidence Level: Grade B)

35. Clinicians should inform localized prostate cancer patients that open and robot-assisted radical prostatectomy offer similar cancer control, continence recovery, and sexual recovery outcomes. (Moderate Recommendation; Evidence Level: Grade C)
36. Clinicians should inform localized prostate cancer patients that robotic/laparoscopic or perineal techniques are associated with less blood loss than retropupic prostatectomy. (Strong Recommendation; Evidence Level: Grade B)
37. Clinicians should counsel localized prostate cancer patients that nerve-sparing is associated with better erectile function recovery than non-nerve sparing. (Strong Recommendation; Evidence Level: Grade A)
38. Clinicians should not treat localized prostate cancer patients who have elected to undergo radical prostatectomy with neoadjuvant ADT or other systemic therapy outside of clinical trials. (Strong Recommendation; Evidence Level: Grade A)
39. Clinicians should inform localized prostate cancer patients considering prostatectomy, that older men experience higher rates of permanent erectile dysfunction and urinary incontinence after prostatectomy compared to younger men. (Strong Recommendation; Evidence Level: Grade B)
40. Pelvic lymphadenectomy can be considered for any localized prostate cancer patients undergoing radical prostatectomy and is recommended for those with unfavorable intermediate-risk or high-risk disease. Patients should be counseled regarding the common complications of lymphadenectomy, including lymphocele development and its treatment. (Expert Opinion)
41. Clinicians should inform localized prostate cancer patients with unfavorable intermediate-risk or high-risk prostate cancer about benefits and risks related to the potential option of adjuvant radiotherapy when locally extensive prostate cancer is found at prostatectomy. (Moderate Recommendation; Evidence Level: Grade B)

Radiotherapy

42. Clinicians may offer single modality external beam radiotherapy or brachytherapy for patients who elect radiotherapy for low-risk localized prostate cancer. (Clinical Principle)
43. Clinicians may offer external beam radiotherapy or brachytherapy alone or in combination for favorable intermediate-risk localized prostate cancer. (Clinical Principle)
44. Clinicians should offer 24-36 months of ADT as an adjunct to either external beam radiotherapy alone or external beam radiotherapy combined with brachytherapy to patients electing radiotherapy for high-risk localized prostate cancer. (Strong Recommendation; Evidence Level: Grade A)
45. Clinicians should inform localized prostate cancer patients that use of ADT with radiation increases the likelihood and severity of adverse treatment-related events on sexual function in most men and can cause other systemic side effects. (Strong Recommendation; Evidence Level: Grade B)
46. Clinicians should consider moderate hypofractionation when the localized prostate cancer patient (of any risk category) and clinician decide on external beam radiotherapy to the prostate (without nodal radiotherapy). (Moderate Recommendation; Evidence Level: Grade B)
47. For localized prostate cancer patients with obstructive, non-cancer-related lower urinary function, surgical approaches may be preferred. If radiotherapy is used for these patients or those with previous significant transurethral resection of the prostate, low-dose rate brachytherapy should be discouraged. (Moderate Recommendation; Evidence Level: Grade C)
48. Clinicians should inform localized prostate cancer patients who are considering proton beam therapy that it offers no clinical advantage over other forms of definitive treatment. (Moderate Recommendation; Evidence Level: Grade C)
49. Clinicians should inform localized prostate cancer patients considering brachytherapy that it has similar effects as external beam radiotherapy with regard to erectile dysfunction and proctitis but can also exacerbate urinary obstructive symptoms. (Expert Opinion)

Whole Gland Cryosurgery

50. Clinicians may consider whole gland cryosurgery in low- and intermediate-risk localized prostate cancer patients who are not suitable for either radical prostatectomy or radiotherapy due to comorbidities yet have >10 year life expectancy. (Expert Opinion)
51. Clinicians should inform localized prostate cancer patients considering whole gland cryosurgery that cryosurgery has similar progression-free survival as did non-dose escalated external beam radiation (also given with neoadjuvant hormonal therapy) in low- and intermediate-risk disease, but conclusive comparison of cancer mortality is lacking. (Conditional Recommendation; Evidence Level: Grade C)
52. Defects from prior transurethral resection of the prostate are a relative contraindication for whole gland cryosurgery due to the increased risk of urethral sloughing. (Clinical Principle)
53. For whole gland cryosurgery treatment, clinicians should utilize a third or higher generation, argon-based cryosurgical system for whole gland cryosurgery treatment. (Clinical Principle)
54. Clinicians should inform localized prostate cancer patients considering cryosurgery that it is unclear whether or not concurrent ADT improves cancer control, though it can reduce prostate size to facilitate treatment. (Clinical Principle)
55. Clinicians should inform localized prostate cancer patients considering whole gland cryosurgery that erectile dysfunction is an expected outcome. (Clinical Principle)
56. Clinicians should inform localized prostate cancer patients considering whole gland cryosurgery about the adverse events of urinary incontinence, irritative and obstructive urinary problems. (Strong Recommendation; Evidence Level: Grade B)

HIFU and Focal Therapy

57. Clinicians should inform those localized prostate cancer patients considering focal therapy or HIFU that these treatment options lack robust evidence of efficacy. (Expert Opinion)
58. Clinicians should inform localized prostate cancer patients who are considering HIFU that even though HIFU is approved by the FDA for the destruction of prostate tissue, it is not approved explicitly for the treatment of prostate cancer (Expert Opinion).
59. Clinicians should advise localized prostate cancer patients considering HIFU that tumor location may influence oncologic outcome. Limiting apical treatment to minimize morbidity increases the risk of cancer persistence. (Moderate Recommendation; Evidence Level: Grade C)
60. As prostate cancer is often multifocal, clinicians should inform localized prostate cancer patients considering focal therapy that focal therapy may not be curative and that further treatment for prostate cancer may be necessary. (Expert Opinion)

OUTCOME EXPECTATIONS AND MANAGEMENT

Treatment Side Effects and Health Related Quality of Life

61. Clinicians should inform localized prostate cancer patients that erectile dysfunction occurs in many patients following prostatectomy or radiation, and that ejaculate will be lacking despite preserved ability to attain orgasm, whereas observation does not cause such sexual dysfunction. (Strong Recommendation; Evidence Level: Grade B)
62. Clinicians should inform localized prostate cancer patients that long-term obstructive or irritative urinary problems occur in a subset of patients following observation or active surveillance or following radiation, whereas prostatectomy can relieve pre-existing urinary obstruction. (Strong Recommendation; Evidence Level: Grade B)
63. Clinicians should inform localized prostate cancer patients that whole-gland cryosurgery is associated with worse sexual side effects and similar urinary and bowel/rectal side effects as those after radiotherapy. (Strong Recommendation; Evidence Level: Grade B)
64. Clinicians should inform localized prostate cancer patients that temporary urinary incontinence occurs in most patients after prostatectomy and persists long-term in a small but significant subset, more than during

observation or active surveillance or after radiation. (Strong Recommendation; Evidence Level: Grade A

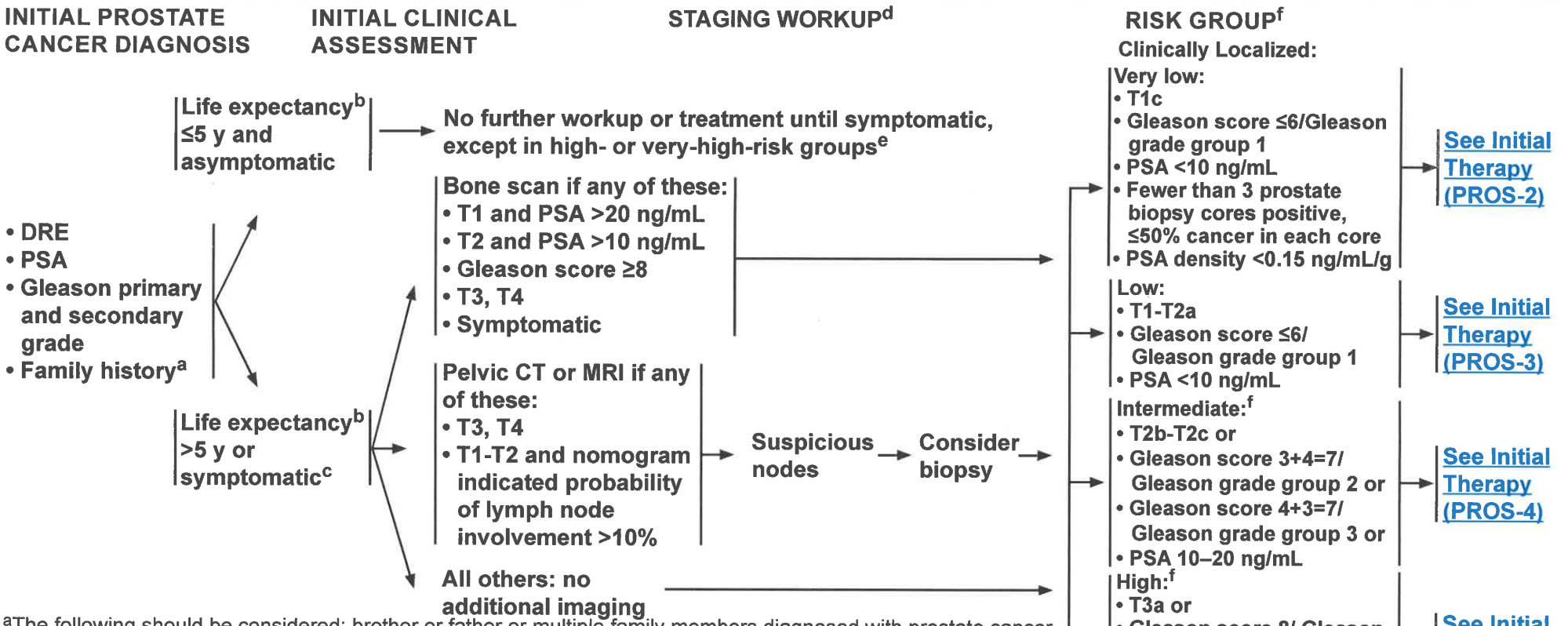
65. Clinicians should inform localized prostate cancer patients that temporary proctitis following radiation persists in some patients long-term in a small but significant subset and is rare during observation or active surveillance or after prostatectomy. (Strong Recommendation; Evidence Level: Grade A)

Post-Treatment Follow Up

66. Clinicians should monitor localized prostate cancer patients post therapy with PSA, even though not all PSA recurrences are associated with metastatic disease and prostate cancer specific death. (Clinical Principle)
67. Clinicians should inform localized prostate cancer patients of their individualized risk-based estimates of post-treatment prostate cancer recurrence. (Clinical Principle)
68. Clinicians should support localized prostate cancer patients who have survivorship or outcomes concerns by facilitating symptom management and encouraging engagement with professional or community-based resources. (Clinical Principle)

NCCN Guidelines Version 2.2017
Prostate Cancer

NCCN Guidelines Index
Table of Contents
Discussion



[a]The following should be considered: brother or father or multiple family members diagnosed with prostate cancer at less than 60 years of age, germline DNA repair gene abnormalities, especially BRCA2 mutation or Lynch syndrome (germline mutations in MLH1, MSH2, MSH6, or PMS2) and/or strong family history for breast or ovarian cancer (suggests possibility of BRCA2 mutation) or colorectal, endometrial, gastric, ovarian, pancreatic, small bowel, urothelial, kidney, or bile duct cancer (suggests possibility of Lynch syndrome).

[b]See Principles of Life Expectancy Estimation (PROS-A).

[c]Men with clinically localized disease may consider the use of tumor-based molecular assays. Retrospective case cohort studies have shown that molecular assays performed on biopsy or prostatectomy specimens provide prognostic information independent of NCCN risk groups. These include, but are not limited to, likelihood of death with conservative management, likelihood of biochemical progression after radical prostatectomy or external beam therapy, and likelihood of developing metastasis after radical prostatectomy or salvage radiotherapy. See Discussion.

[d]See Principles of Imaging (PROS-B).

[e]Androgen deprivation therapy (ADT) or radiation therapy (RT) may be considered in selected patients with high- or very-high-risk disease, where complications, such as hydronephrosis or metastasis, can be expected within 5 y. (See PROS-5 or PROS-6).

[f]Patients with multiple adverse factors may be shifted into the next highest risk group.

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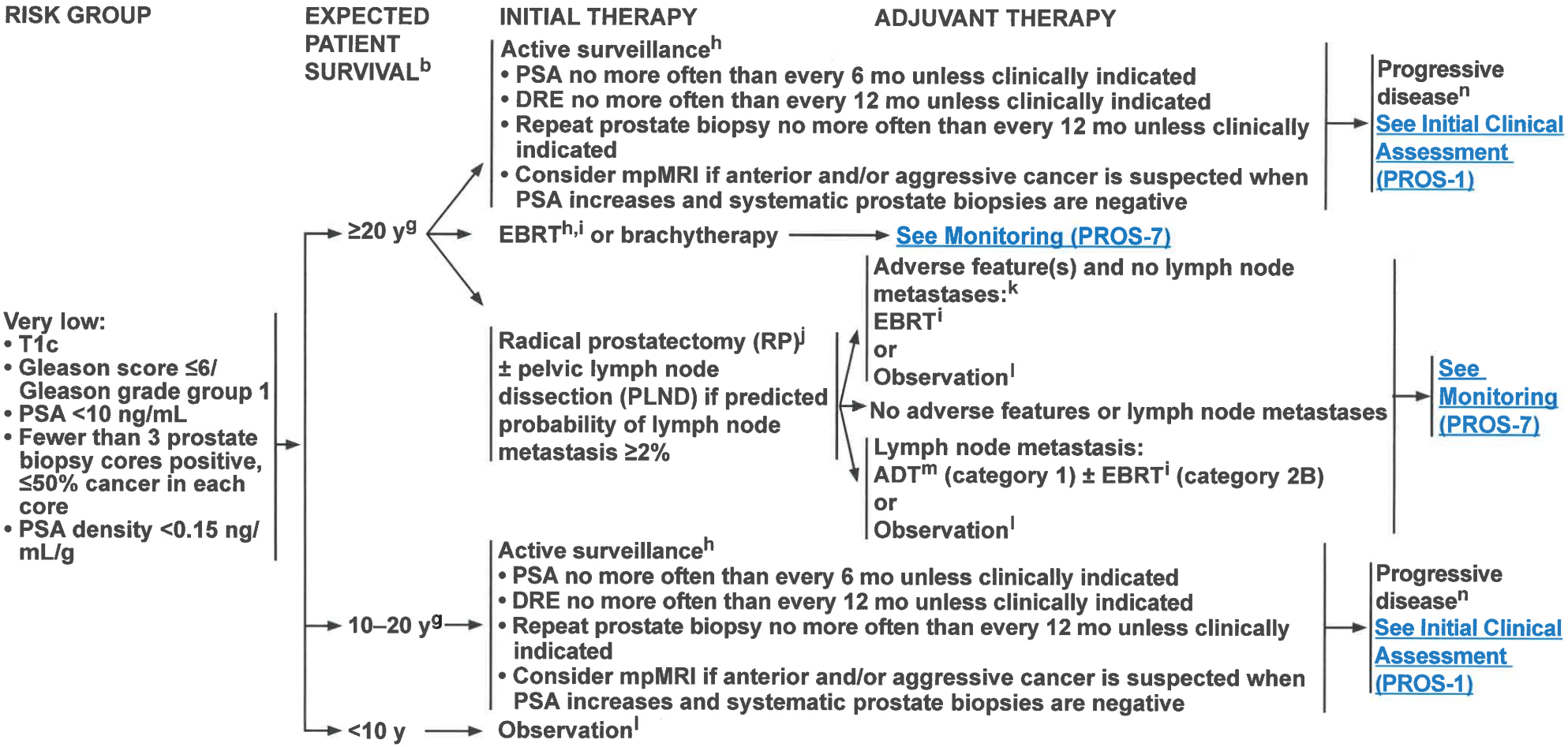

[b] See Principles of Life Expectancy Estimation (PROS-A).

[g] The panel remains concerned about the problems of over-treatment related to the increased diagnosis of early prostate cancer from PSA testing. See NCCN Guidelines for Prostate Cancer Early Detection. Active surveillance is recommended for these subsets of patients.

[h] Active surveillance involves actively monitoring the course of disease with the expectation to intervene with potentially curative therapy if the cancer progresses. See Principles of Active Surveillance and Observation (PROS-C).

[i] See Principles of Radiation Therapy (PROS-D).

[j] See Principles of Surgery (PROS-E).

[k] Adverse laboratory/pathologic features include: positive margin(s), seminal vesicle invasion, extracapsular extension, or detectable PSA.

[l] Observation involves monitoring the course of disease with the expectation to deliver palliative therapy for the development of symptoms or a change in exam or PSA that suggests symptoms are imminent. See Principles of Active Surveillance and Observation (PROS-C).

[m] See Principles of Androgen Deprivation Therapy (PROS-F).

[n] Criteria for progression are not well defined and require physician judgment; however, a change in risk group strongly implies disease progression. See Discussion.

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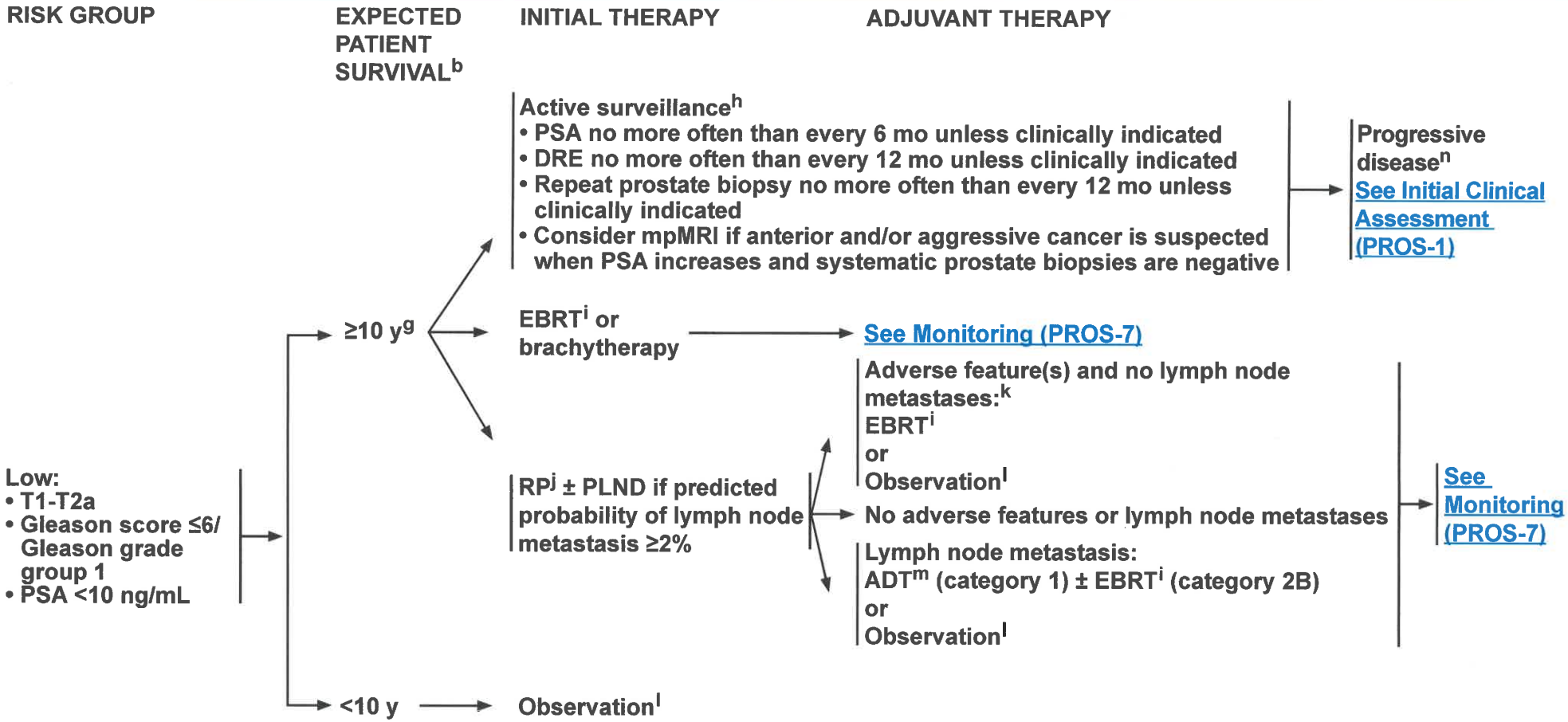

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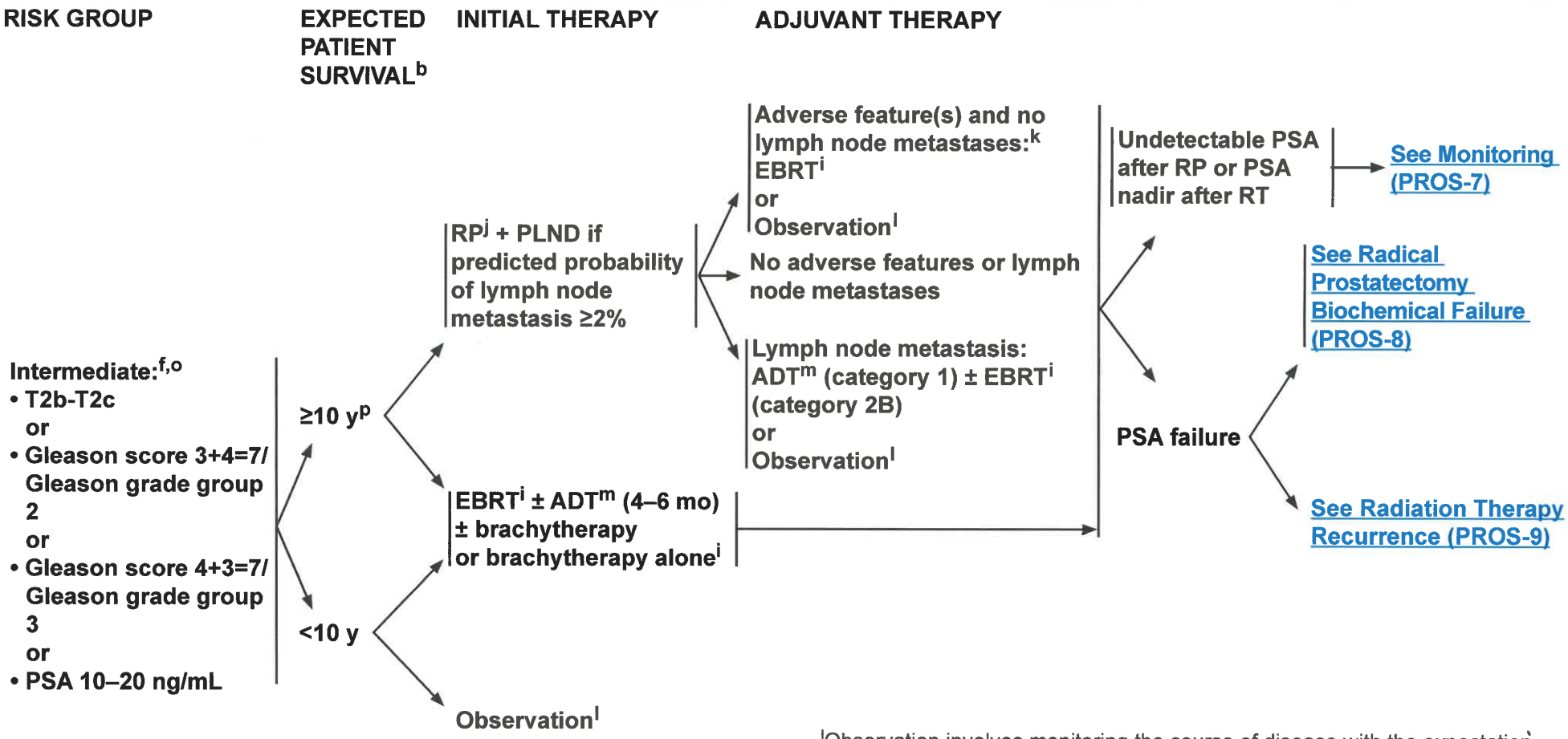

[b] See Principles of Life Expectancy Estimation (PROS-A).
[f] Patients with multiple adverse factors may be shifted into the next highest risk group.
[i] See Principles of Radiation Therapy (PROS-D).
[j] See Principles of Surgery (PROS-E).
[k] Adverse laboratory/pathologic features include: positive margin(s), seminal vesicle invasion, extracapsular extension, or detectable PSA.
[l] Observation involves monitoring the course of disease with the expectation to deliver palliative therapy for the development of symptoms or a change in exam or PSA that suggests symptoms are imminent. See Principles of Active Surveillance and Observation (PROS-C).
[m] See Principles of Androgen Deprivation Therapy (PROS-F).
[o] Patients with favorable intermediate-risk prostate cancer (predominant Gleason grade 3 [ie, Gleason score 3 + 4 = 7/Gleason grade group 2], and percentage of positive biopsy cores <50 percent, and no more than one NCCN intermediate risk factor) may be considered for active surveillance. See Discussion section.
[p] Active surveillance of unfavorable intermediate and high-risk clinically localized cancers is not recommended in patients with a life expectancy >10 years (category 1).

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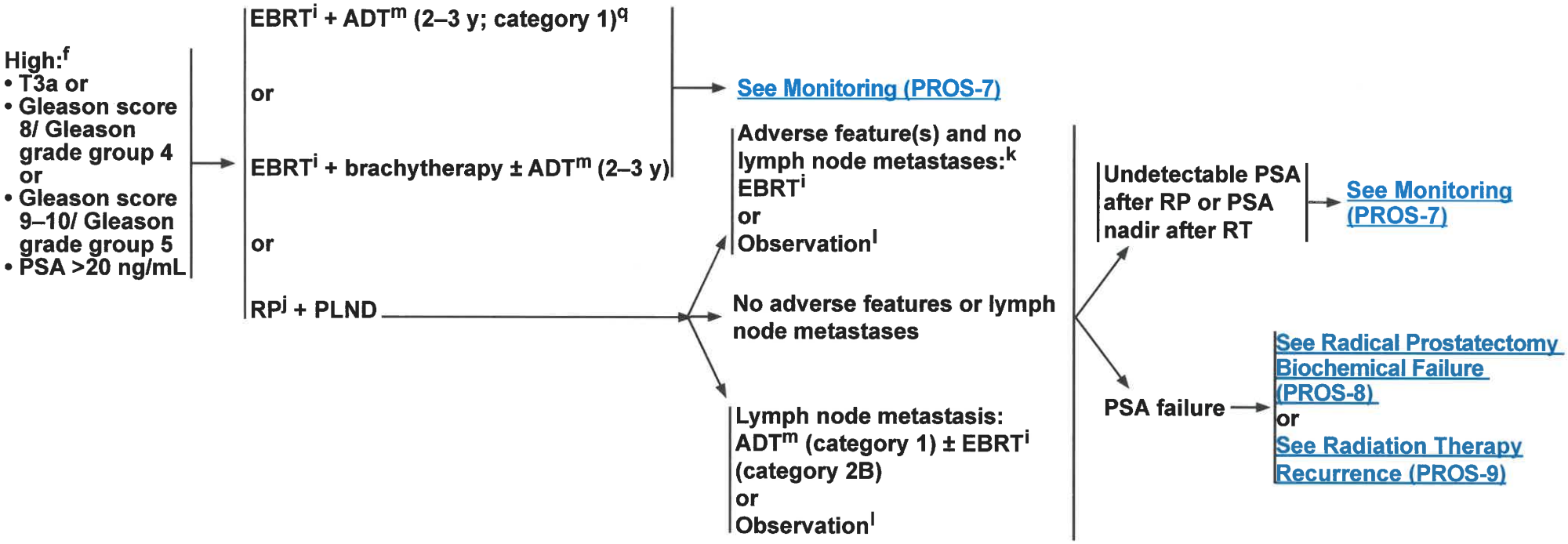

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[m]See Principles of Androgen Deprivation Therapy (PROS-F).

[q]Six cycles of docetaxel every 3 weeks without prednisone may be administered after completion of radiation in selected patients who are fit for chemotherapy.

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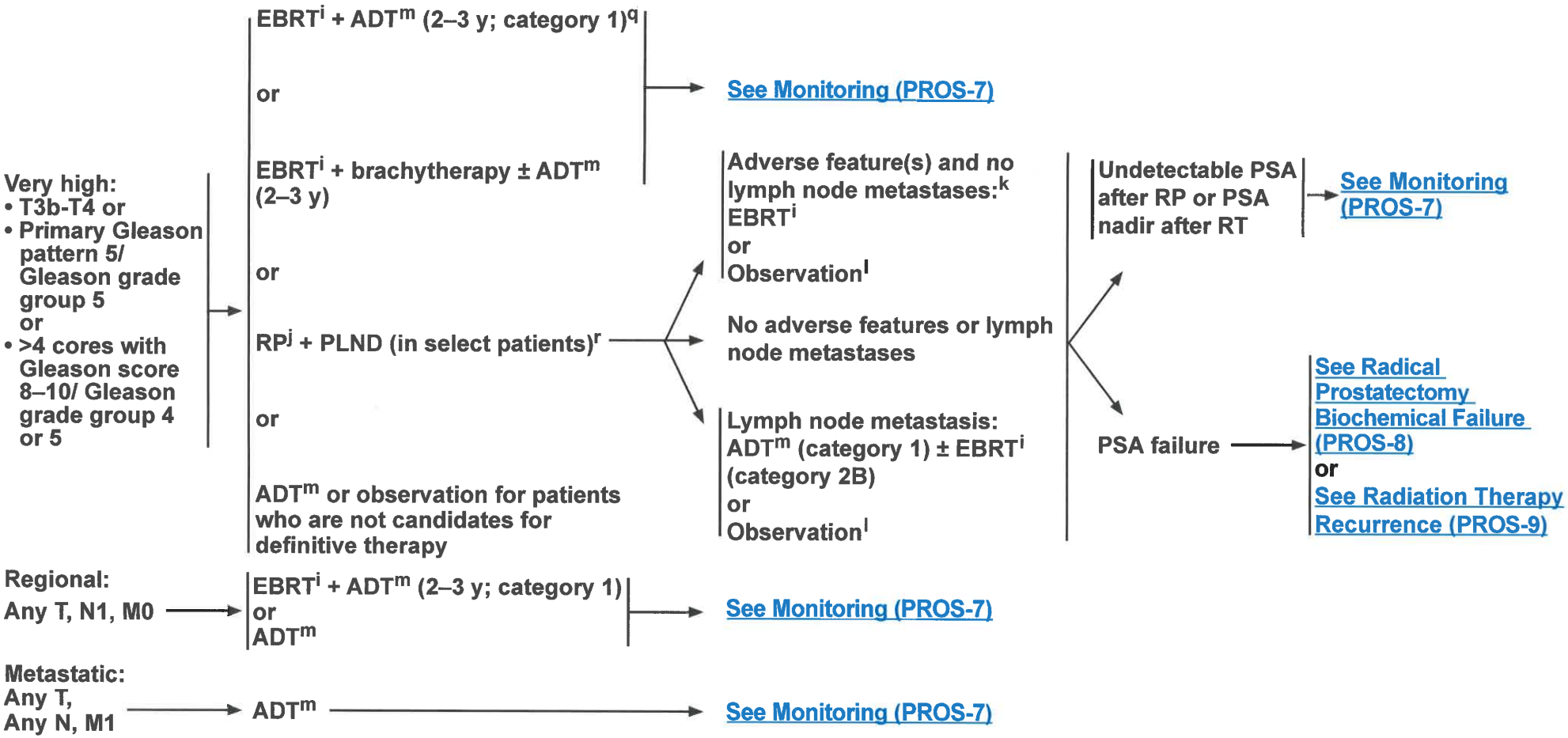

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[m] See Principles of Androgen Deprivation Therapy (PROS-F).

[q] Six cycles of docetaxel every 3 weeks without prednisone may be administered after completion of radiation in selected patients who are fit for chemotherapy.

[r] RP + PLND can be considered in younger, healthier patients without tumor fixation to the pelvic side-wall.

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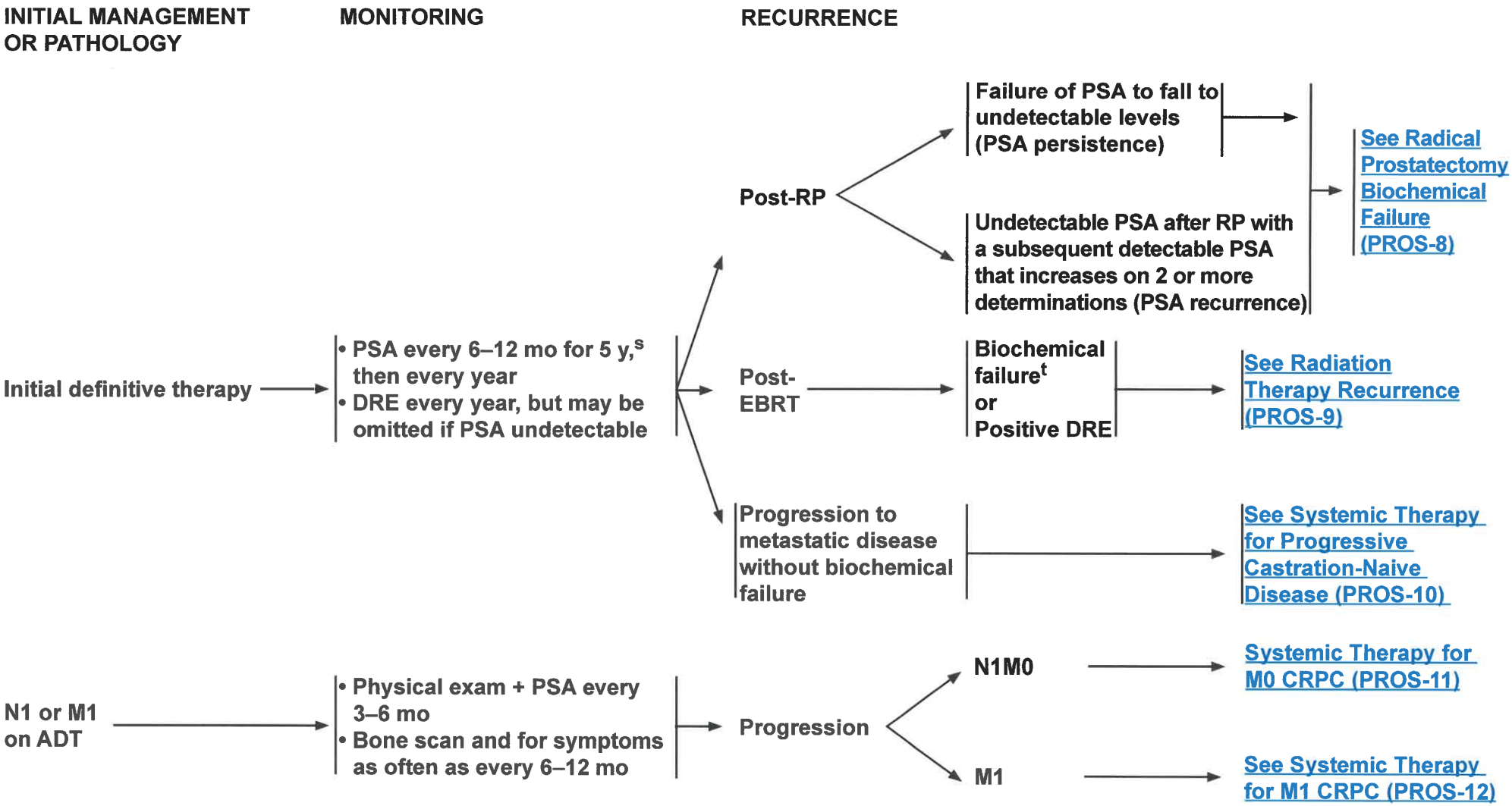

[s]PSA as frequently as every 3 mo may be necessary to clarify disease status, especially in high-risk men.

[t]RTOG-ASTRO (Radiation Therapy Oncology Group - American Society for Therapeutic Radiology and Oncology) Phoenix Consensus: 1) PSA increase by 2 ng/mL or more above the nadir PSA is the standard definition for biochemical failure after EBRT with or without HT; and 2) A recurrence evaluation should be considered when PSA has been confirmed to be increasing after radiation even if the increase above nadir is not yet 2 ng/mL, especially in candidates for salvage local therapy who are young and healthy. Retaining a strict version of the ASTRO definition allows comparison with a large existing body of literature. Rapid increase of PSA may warrant evaluation (prostate biopsy) prior to meeting the Phoenix definition, especially in younger or healthier men.

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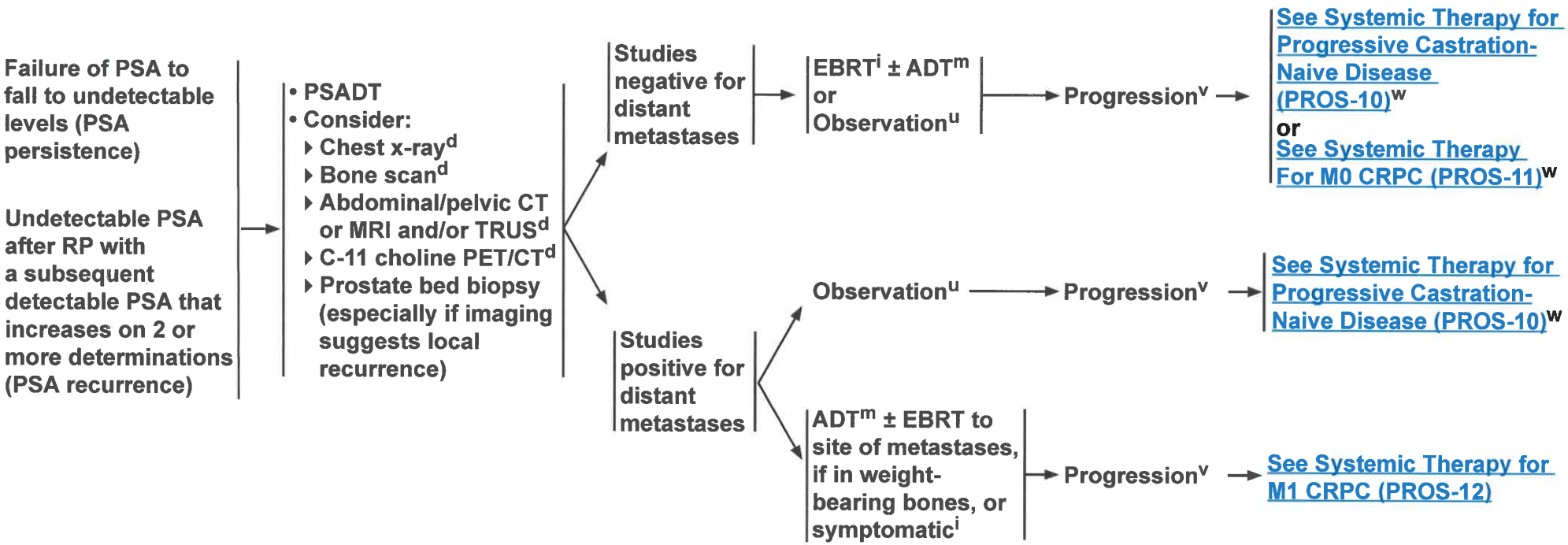
RADICAL PROSTATECTOMY BIOCHEMICAL FAILURE



[d] See Principles of Imaging (PROS-B).
[i] See Principles of Radiation Therapy (PROS-D).
[m] See Principles of Androgen Deprivation Therapy (PROS-F).
[u] Observation involves monitoring the course of disease with the expectation to begin ADT when symptoms develop or PSA changes to suggest symptoms are imminent. See Principles of Active Surveillance and Observation (PROS-C).
[v] Imaging should include chest x-ray, bone scan, and abdominal/pelvic CT or MRI with and without contrast. Consider C-11 choline PET/CT. See Principles of Imaging (PROS-B).
[w] The term "castration-naive" is used to define patients who are not on ADT at the time of progression. The NCCN Prostate Cancer Panel uses the term "castration-naive" even when patients have had neoadjuvant, concurrent, or adjuvant ADT as part of radiation therapy provided they have recovered testicular function.

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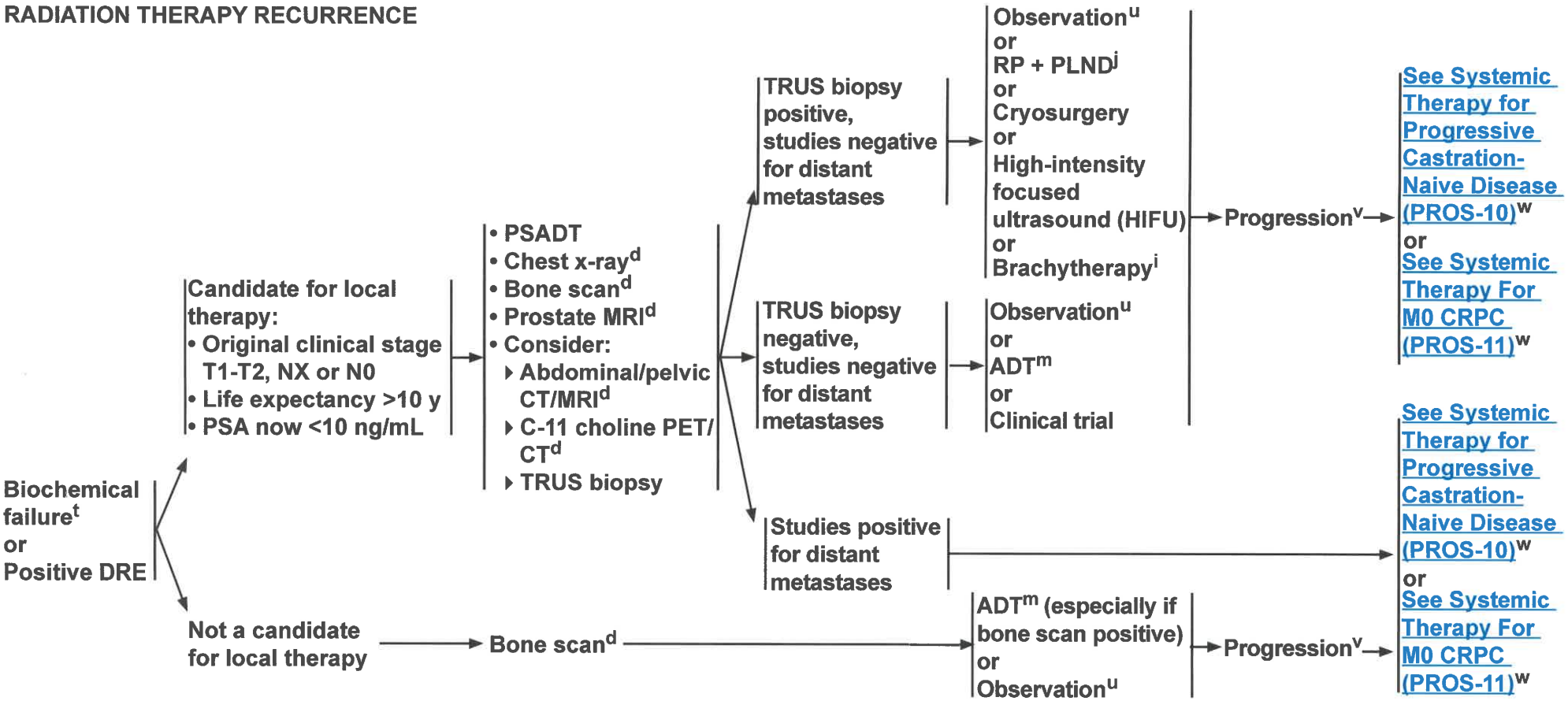
RADIATION THERAPY RECURRENCE



[d] See Principles of Imaging (PROS-B).

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[u] Observation involves monitoring the course of disease with the expectation to begin ADT when symptoms develop or PSA changes to suggest symptoms are imminent. See Principles of Active Surveillance and Observation (PROS-C).

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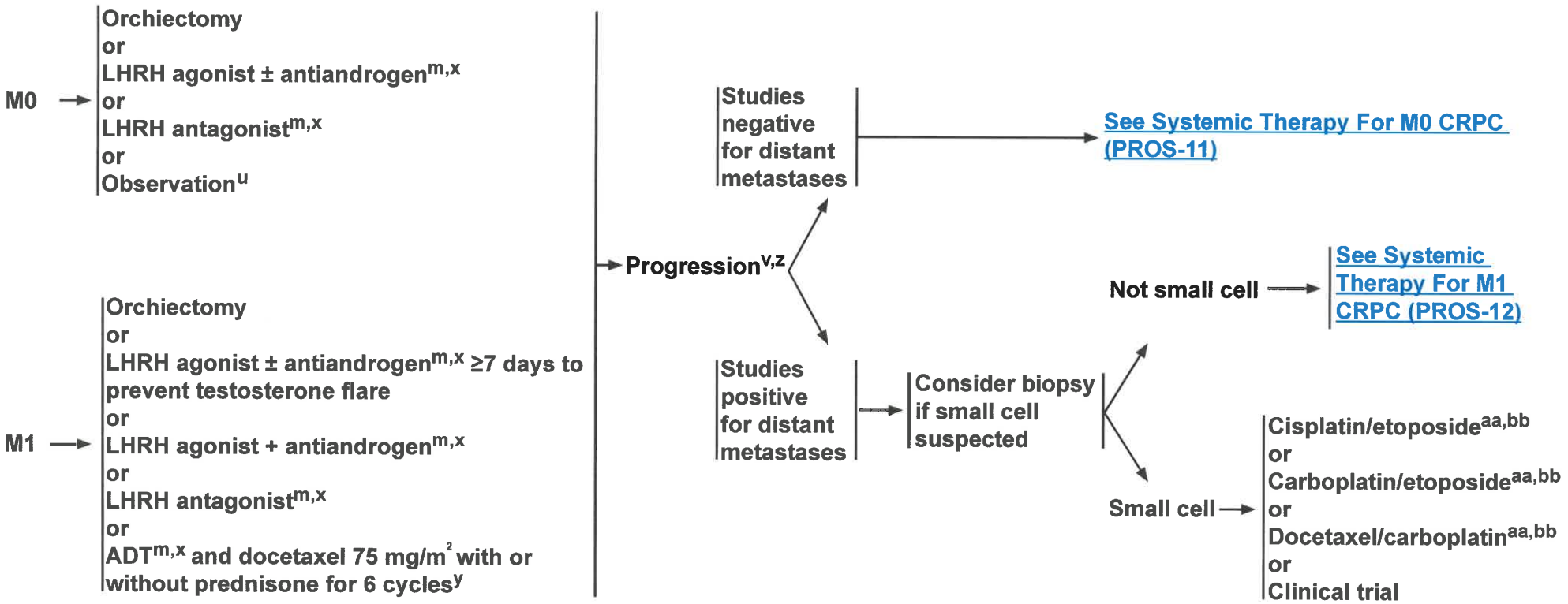
SYSTEMIC THERAPY FOR PROGRESSIVE CASTRATION-NAIVE DISEASE[w]



[m] See Principles of Androgen Deprivation Therapy (PROS-F).

[u] Observation involves monitoring the course of disease with the expectation to begin ADT when symptoms develop or PSA changes to suggest symptoms are imminent. See Principles of Active Surveillance and Observation (PROS-C).

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[x] Intermittent ADT can be considered for men with M0 or M1 disease to reduce toxicity. See Principles of Androgen Deprivation Therapy (PROS-F)

[y] High-volume disease is differentiated from low-volume disease by visceral metastases and/or 4 or more bone metastases, with at least one metastasis beyond the pelvis vertebral column. Patients with low-volume disease have less certain benefit from early treatment with docetaxel combined with ADT.

[z] Assure castrate level of testosterone.

[aa] See Principles of Immunotherapy and Chemotherapy (PROS-G).

[bb] See NCCN Guidelines for Small Cell Lung Cancer.

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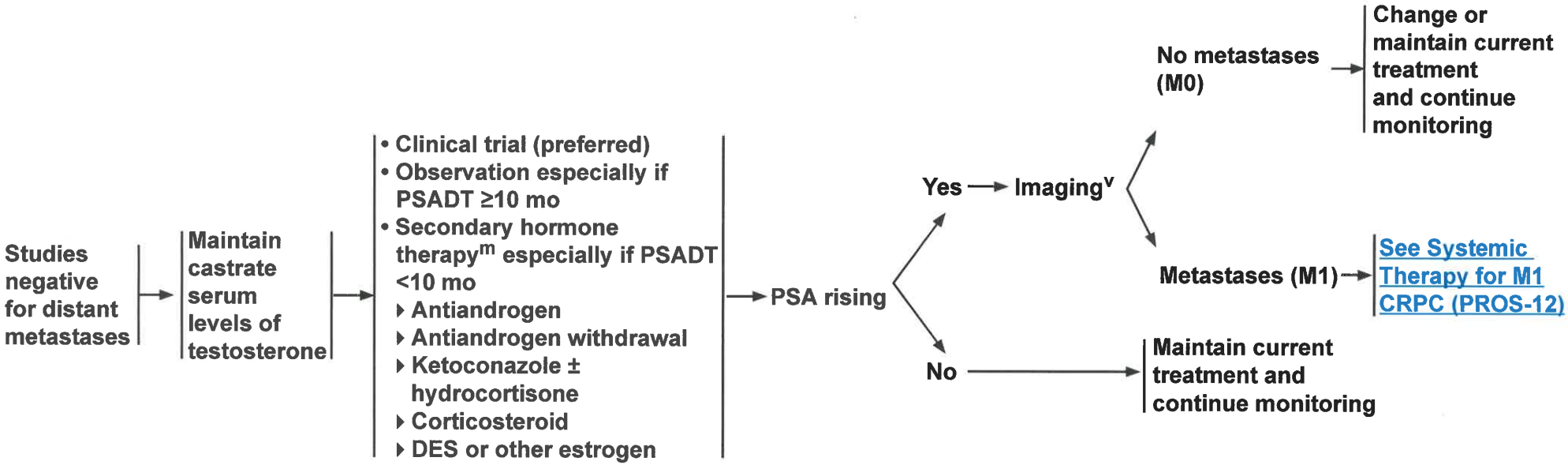
SYSTEMIC THERAPY FOR M0 CASTRATION-RECURRENT PROSTATE CANCER



[m] See Principles of Androgen Deprivation Therapy (PROS-F).

[v] Imaging should include chest x-ray, bone scan, and abdominal/pelvic CT or MRI with and without contrast. Consider C-11 choline PET/CT. See Principles of Imaging (PROS-B).

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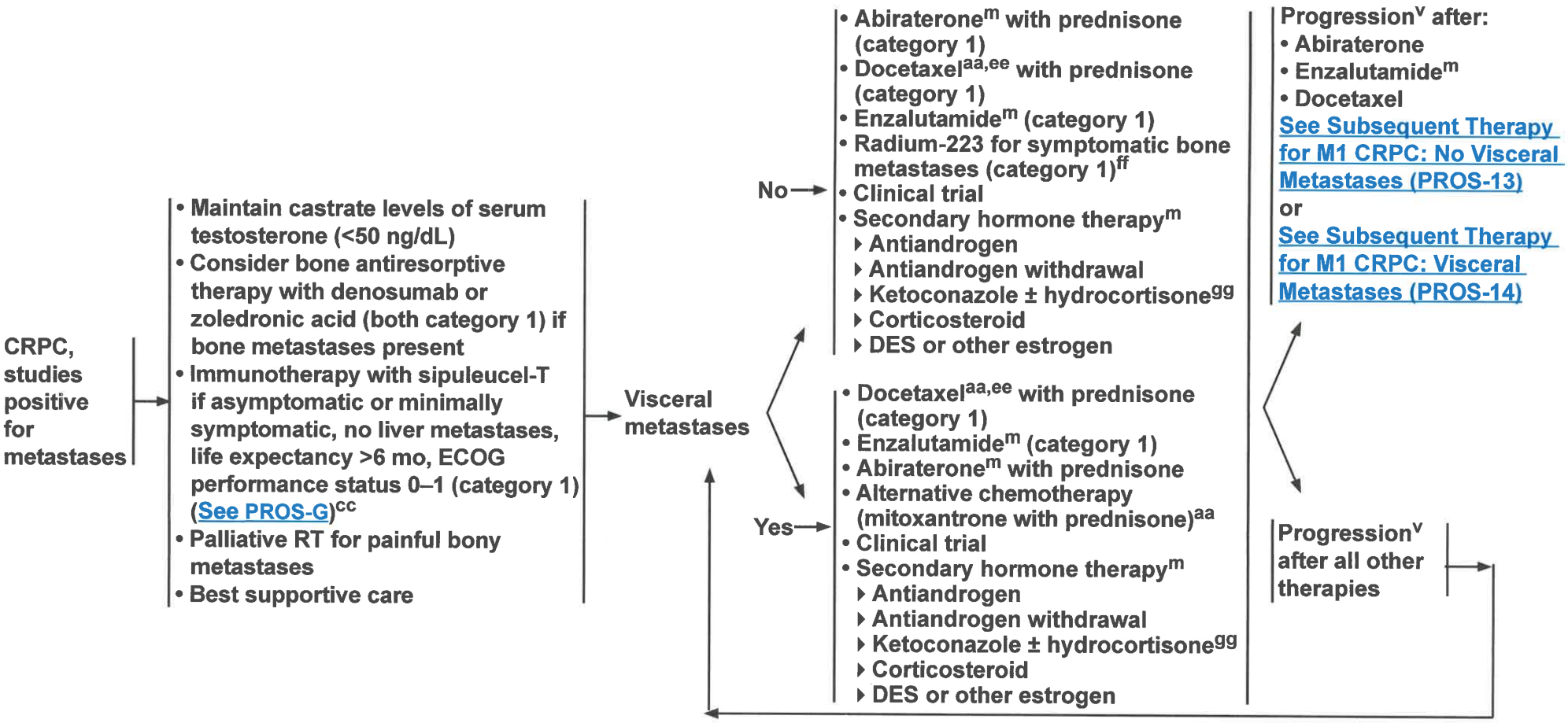
SYSTEMIC THERAPY FOR M1 CASTRATION-RECURRENT PROSTATE CANCER



[m] See Principles of Androgen Deprivation Therapy (PROS-F).

[v] Imaging should include chest x-ray, bone scan, and abdominal/pelvic CT or MRI with and without contrast. Consider C-11 choline PET/CT. See Principles of Imaging (PROS-B).

[aa] See Principles of Immunotherapy and Chemotherapy (PROS-G).

[cc] Sipuleucel-T has not been studied in patients with visceral metastases.

[ee] Although most patients without symptoms are not treated with chemotherapy, the survival benefit reported for docetaxel applies to those with or without symptoms. Docetaxel may be considered for patients with signs of rapid progression or visceral metastases despite lack of symptoms.

[ff] Radium-223 is not approved for use in combination with docetaxel or any other chemotherapy. See Principles of Radiation Therapy (PROS-D, page 2 of 2).

[gg] Ketoconazole ± hydrocortisone should not be used if the disease progressed on abiraterone.

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SUBSEQUENT SYSTEMIC THERAPY FOR M1 CASTRATION-RECURRENT PROSTATE CANCER[hh]

Prior therapy enzalutamide/ abiraterone[ii]

- Docetaxel with prednisone (category 1)[aa]
- Abiraterone[m] with prednisone
- Enzalutamide[m]
- Radium-223 for symptomatic bone metastases (category 1)[ff]
- Sipuleucel-T if asymptomatic or minimally symptomatic, no liver metastases, life expectancy >6 mo, ECOG 0–1
- Clinical trial
- Other secondary hormone therapy[m]
  - Antiandrogen
  - Antiandrogen withdrawal
  - Ketoconazole ± hydrocortisone[gg]
  - Corticosteroid
  - DES or other estrogen
- Best supportive care

No visceral metastases

Prior therapy docetaxel

- Enzalutamide (category 1)[m]
- Abiraterone[m] with prednisone (category 1)
- Radium-223 for symptomatic bone metastases (category 1)[ff]
- Cabazitaxel with prednisone (category 1)[aa]
- Sipuleucel-T if asymptomatic or minimally symptomatic, no liver metastases, life expectancy >6 mo, ECOG 0–1
- Clinical trial
- Docetaxel rechallenge[aa]
- Alternative chemotherapy (mitoxantrone with prednisone)[aa]
- Other secondary hormone therapy[m]
  - Antiandrogen
  - Antiandrogen withdrawal
  - Ketoconazole ± hydrocortisone[gg]
  - Corticosteroid
  - DES or other estrogen
- Best supportive care

[m] See Principles of Androgen Deprivation Therapy (PROS-F).
[aa] See Principles of Immunotherapy and Chemotherapy (PROS-G).
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[gg] Ketoconazole ± hydrocortisone should not be used if the disease progressed on abiraterone.
[hh] Patients can continue through all treatment options listed. Best supportive care is always an appropriate option.
[ii] Limited data suggest a possible role for AR-V7 testing to help guide selection of therapy (See Discussion).

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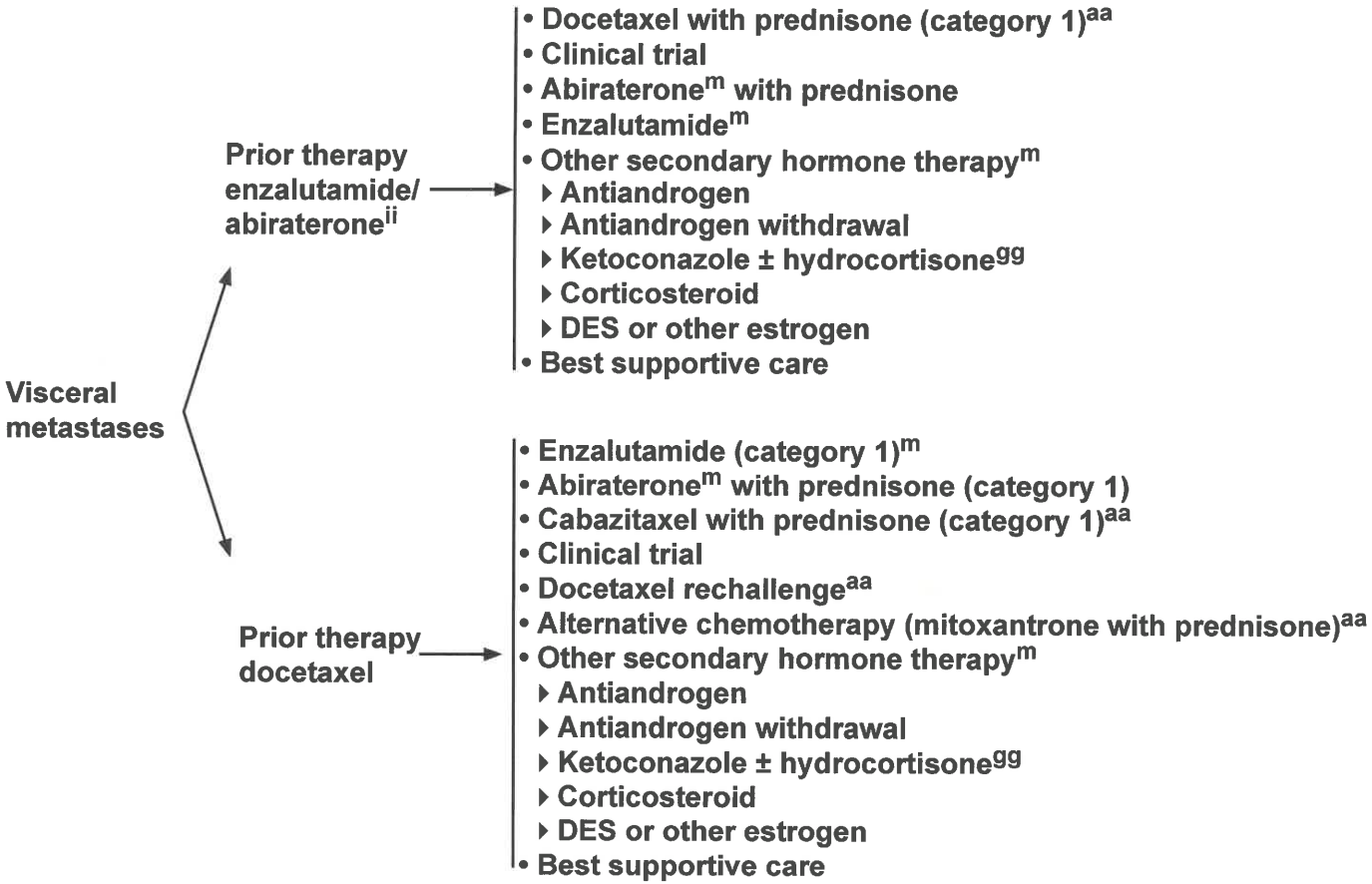

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[hh]Patients can continue through all treatment options listed. Best supportive care is always an appropriate option.

[ii]Limited data suggest a possible role for AR-V7 testing to help guide selection of therapy (See Discussion).

[m]See Principles of Androgen Deprivation Therapy (PROS-F).

[aa]See Principles of Immunotherapy and Chemotherapy (PROS-G).

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Renal Mass and Localized Renal Cancer[1]

Evaluation/Diagnosis

1. Obtain high quality, multiphase, cross-sectional abdominal imaging to optimally characterize/stage the renal mass.
2. Obtain CMP, CBC, and UA. If malignancy suspected, metastatic evaluation should include chest imaging and careful review of abdominal imaging.
3. Assign CKD stage based on GFR and degree of proteinuria.

Counseling

1. A urologist should lead the counseling process and should consider all management strategies. A multidisciplinary team should be included when necessary.
2. Counseling should include current perspectives about tumor biology and a patient-specific oncologic risk assessment. For cT1a tumors, the low oncologic risk of many small renal masses should be reviewed.
3. Counseling should review the most common and serious urologic and non-urologic morbidities of each treatment pathway and the importance of patient age, comorbidities/frailty, and life expectancy.
4. Physicians should review the importance of renal functional recovery related to renal mass management, including risk of progressive CKD, potential short/long-term need for dialysis, and long-term overall survival considerations.
5. Consider referral to nephrology in patients with a high risk of CKD progression, including those with GFR < 45[2], confirmed proteinuria, diabetics with preexisting CKD, or whenever GFR is expected to be < 30[2] after intervention.
6. Recommend genetic counseling for all patients ≤ 46 years of age and consider genetic counseling for patients with multifocal or bilateral renal masses, or if personal/family history suggests a familial renal neoplastic syndrome.

Renal Mass Biopsy (RMB)

1. RMB should be considered when a mass is suspected to be hematologic, metastatic, inflammatory, or infectious.
2. RMB is not required for young/healthy patients who are not willing to accept the uncertainties associated with RMB or for older/frail patients who will be managed conservatively independent of RMB.
3. Counsel regarding rationale, positive/negative predictive values, potential risks and non-diagnostic rates of RMB.
4. Multiple core biopsies are preferred over FNA.

Management

Partial Nephrectomy (PN) and Nephron-Sparing Approaches

1. Prioritize PN for the management of the cT1a renal mass when intervention is indicated.
2. Prioritize nephron-sparing approaches for patients with an anatomic or functionally solitary kidney, bilateral tumors, known familial RCC, preexisting CKD, or proteinuria.
3. Consider nephron-sparing approaches for patients who are young, have multifocal masses, or comorbidities that are likely to impact renal function in the future.

Radical Nephrectomy (RN)

1. Physicians should consider RN for patients where increased oncologic potential is suggested by tumor size, RMB, and/or imaging characteristics. In this setting, RN is preferred if all of the following criteria are met: 1) high tumor complexity and PN would be challenging even in experienced hands; 2) no preexisting CKD/proteinuria; and 3) normal contralateral kidney and new baseline eGFR will likely be > 45[2].

Thermal Ablation (TA)

1. Consider TA an alternate approach for management of cT1a renal masses <3 cm in size. A percutaneous approach is preferred.
2. Both radiofrequency ablation and cryoablation are options.
3. A RMB should be performed prior to TA.
4. Counseling about TA should include information regarding increased likelihood of tumor persistence/recurrence after primary TA, which may be addressed with repeat TA if further intervention is elected.

Active Surveillance (AS)

1. For patients with renal masses suspicious for cancer, especially those <2cm, AS is an option for initial management.
2. Prioritize AS/Expectant Management when the anticipated risk of intervention or competing risks of death outweigh the potential oncologic benefits of active treatment.
3. When the risk/benefit analysis for treatment is equivocal and the patient prefers AS, physicians should repeat imaging in 3-6 months to assess for interval growth and may consider RMB for additional risk stratification.
4. When the oncologic benefits of intervention outweigh the risks of treatment and competing risks of death, physicians should recommend active treatment. In this setting, AS may be pursued only if the patient understands and is willing to accept the associated oncologic risk

Factors Favoring AS/Expectant Management

Patient-related	Tumor-related
Elderly	Tumor size <3cm
Life expectancy <5 years	Tumor growth <5mm/year
High comorbidities	Non-infiltrative
Excessive perioperative risk	Low complexity
Frailty (poor functional status)	Favorable histology
Patient preference for AS	
Marginal renal function	

Principles Related to PN

1. Prioritize preservation of renal function through efforts to optimize nephron mass preservation and avoidance of prolonged warm ischemia.
2. Negative surgical margins should be a priority. The extent of normal parenchyma removed should be determined by surgeon discretion taking into account the clinical situation; tumor characteristics including growth pattern, and interface with normal tissue. Enucleation should be considered in patients with familial RCC, multifocal disease, or severe CKD to optimize parenchymal mass preservation.

Surgical Principles

1. In the presence of clinically concerning regional lymphadenopathy, lymph node dissection should be performed for staging purposes.
2. Adrenalectomy should be performed if imaging and/or intraoperative findings suggest metastasis or direct invasion.
3. A minimally invasive approach should be considered when it would not compromise oncologic, functional and perioperative outcomes.
4. Pathologic evaluation of the adjacent renal parenchyma should be performed after PN or RN to assess for possible nephrologic disease, particularly for patients with CKD or risk factors for developing CKD.

1. Focus is on clinically localized renal masses suspicious for RCC in adults, including solid enhanced tumors and Bosniak 3 and 4 complex cystic lesions. 2. ml/min/1.73m[2].

Female Stress Urinary Incontinence: AUA/SUFU Evaluation and Treatment Algorithm

EVALUATION (INDICATIONS)

Initial evaluation

The initial evaluation of patients desiring to undergo surgical intervention should include the following components:

- History
- Physical exam
- Demonstration of SUI
- PVR assessment
- Urinalysis

Cystoscopy

Should not be performed unless there is a concern for lower urinary tract abnormalities

Urodynamics

May be omitted when SUI is clearly demonstrated

Additional evaluation

Additional evaluation **should** be performed in the following scenarios:

- Lack of definitive diagnosis
- Inability to demonstrate SUI
- Known/suspected NLUTD
- Abnormal urinalysis
- Urgency-predominant MUI
- Elevated PVR
- High-grade POP (if SUI not demonstrated with POP reduction)
- Evidence of significant voiding dysfunction

Additional evaluation **may** be performed in the following scenarios:

- Concomitant OAB symptoms
- Failure of prior anti-incontinence surgery
- Prior POP surgery

In patients who wish to undergo treatment, physicians should counsel regarding the availability of observation, pelvic floor muscle training, other non-surgical options, and surgical interventions. Physicians should counsel patients on potential complications specific to the treatment options.

TREATMENT

Non-Surgical

- Continence pessary
- Vaginal inserts
- Pelvic floor muscle exercises

Surgical

- Bulking agents
- Midurethral sling (synthetic)
- Autologous fascia pubovaginal sling
- Burch colposuspension

If a midurethral sling surgery is selected, either the retropubic or transobturator midurethral sling may be offered. A single-incision sling may be offered to index patients if they are informed as to the immaturity of evidence regarding their efficacy and safety. Physicians must discuss the specific risks and benefits of mesh as well as alternatives to a mesh sling.

SPECIAL CASES

1. Fixed immobile urethra

- Pubovaginal sling
- Retropubic midurethral sling
- Urethral bulking agents

2. Concomitant surgery for POP repair and SUI

Any incontinence procedure

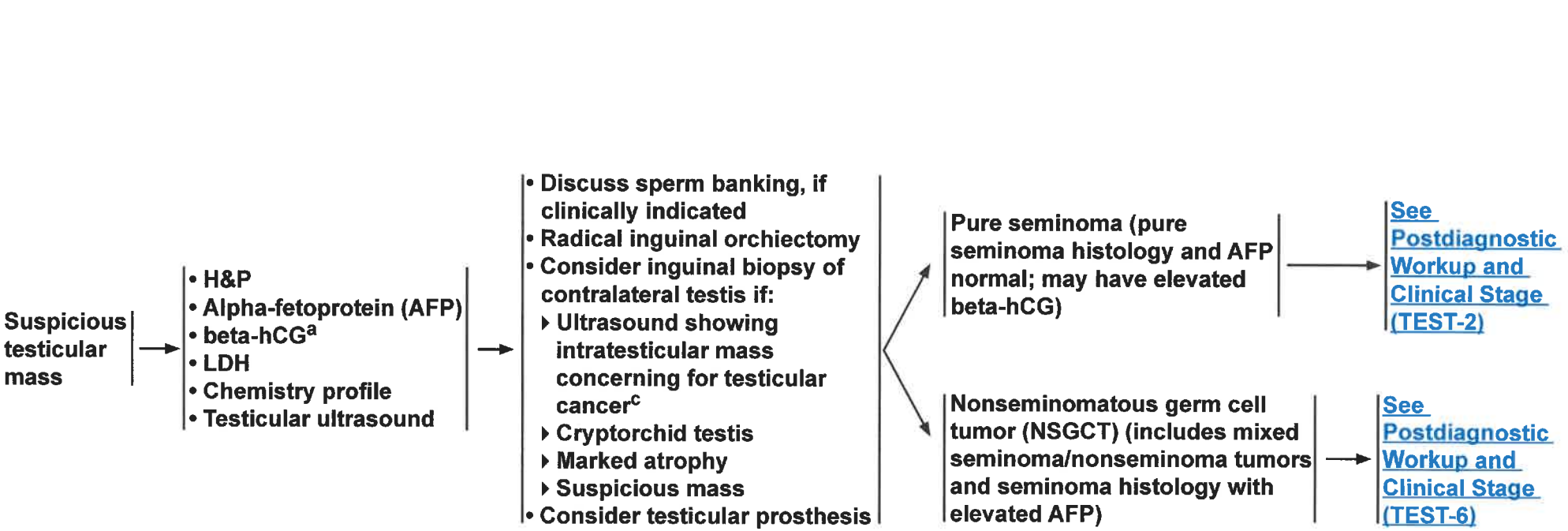
3. Concomitant NLUTD

Surgical treatment following appropriate evaluation and counseling

4. Child-bearing, diabetes, obesity, geriatric

Surgical treatment following appropriate evaluation and counseling

MUI= mixed urinary incontinence; NLUTD= neurogenic lower urinary tract dysfunction;
OAB= overactive bladder; POP= pelvic organ prolapse; PVR= post-void residual; SUI= stress urinary incontinence



[a]Quantitative analysis of beta subunit.
[b]Though rare, when a patient presents with rapidly increasing beta-hCG or AFP and symptoms related to disseminated disease and a testicular mass, chemotherapy can be initiated immediately without waiting for a biopsy diagnosis.
[c]Biopsies are not recommended for microcalcifications.

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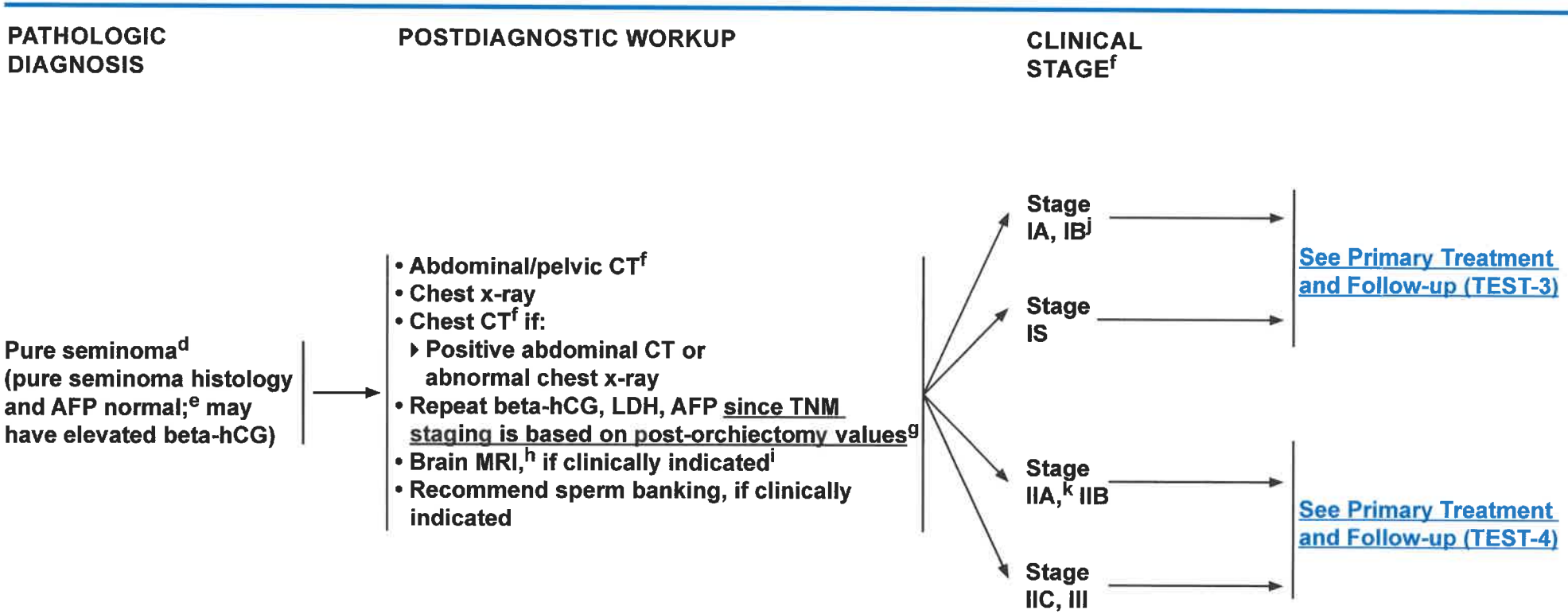

[d]Mediastinal primary seminoma should be treated by risk status used for gonadal seminomas with etoposide/cisplatin for 4 cycles or bleomycin/etoposide/cisplatin for 3 cycles.
[e]If AFP positive, treat as nonseminoma.
[f]With contrast.
[g]Elevated values should be followed after orchiectomy with repeated determination to allow precise staging. Follow declining markers until normalization or plateau. Staging is based on marker levels at the time that the patient starts postorchiectomy therapy (for example, for patients starting chemotherapy for disseminated disease, prognostic category and staging should be assigned based on the serum tumor marker levels on day 1 of cycle 1 of chemotherapy).
[h]With and without contrast.
[i]Eg, beta-hCG >5000 IU/L, or extensive lung metastasis.
[j]The panel recommends using the AJCC Staging 7th edition for subclassifying and making treatment decisions about stage I tumors. (See ST-1 and ST-2)
[k]For select cases of clinical stage IIA disease with borderline retroperitoneal lymph nodes, waiting 4–6 weeks and repeating imaging (chest/abdomen/pelvic CT with contrast) to confirm staging before initiating treatment can be considered.

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Testicular Cancer - Pure Seminoma

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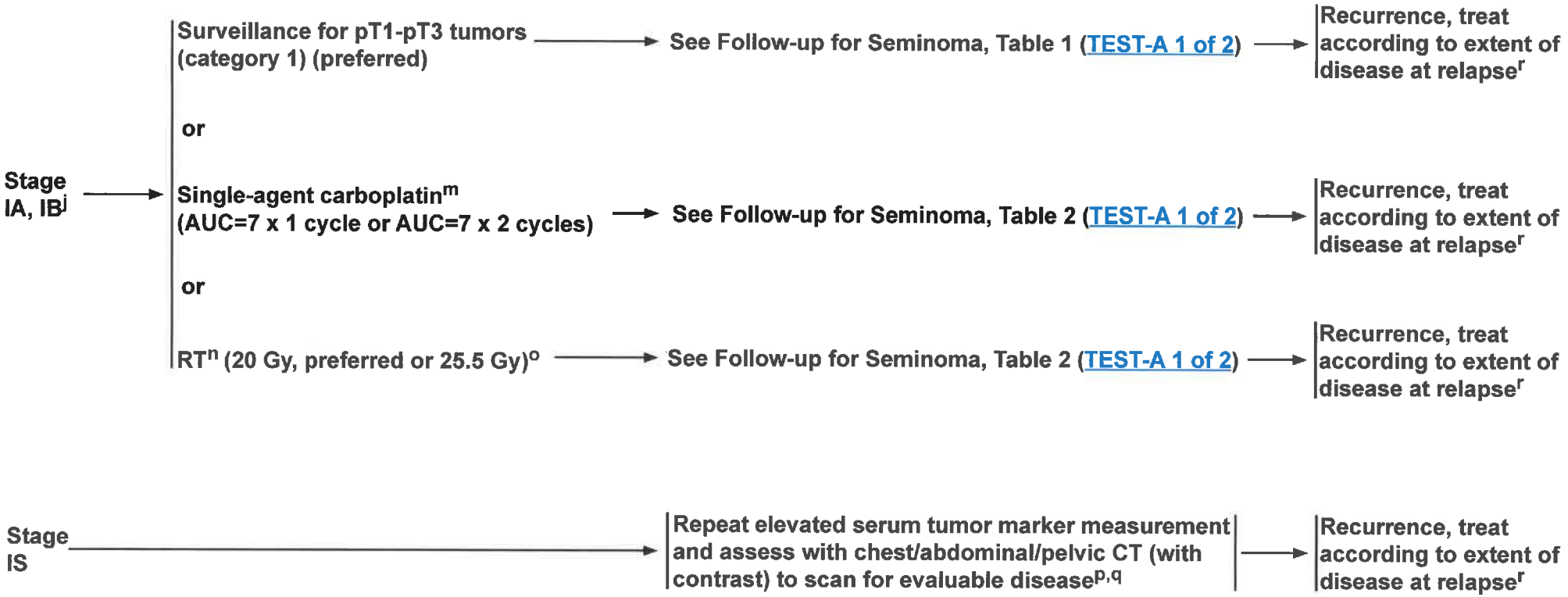

[j]The panel recommends using the AJCC Staging 7th edition for subclassifying and making treatment decisions about stage I tumors. (See ST-1 and ST-2)
[l]Discuss sperm banking prior to chemotherapy or radiation treatment.
[m]Recommend chest/abdomen/pelvic CT scan within the 4 weeks prior to the initiation of chemotherapy to confirm staging, even if scan was done previously.
[n]See Principles of Radiotherapy for Pure Testicular Seminoma (TEST-C).
[o]For stage I seminoma, long-term follow-up studies indicate an increase in late toxicities with radiation treatment. See Discussion.
[p]For further information on Stage IS, see Discussion.
[q]Elevated tumor markers increase the risk of disease outside of the retroperitoneum. Therefore, systemic therapy should be encouraged.
[r]Patients should not be treated based upon an elevated LDH alone.

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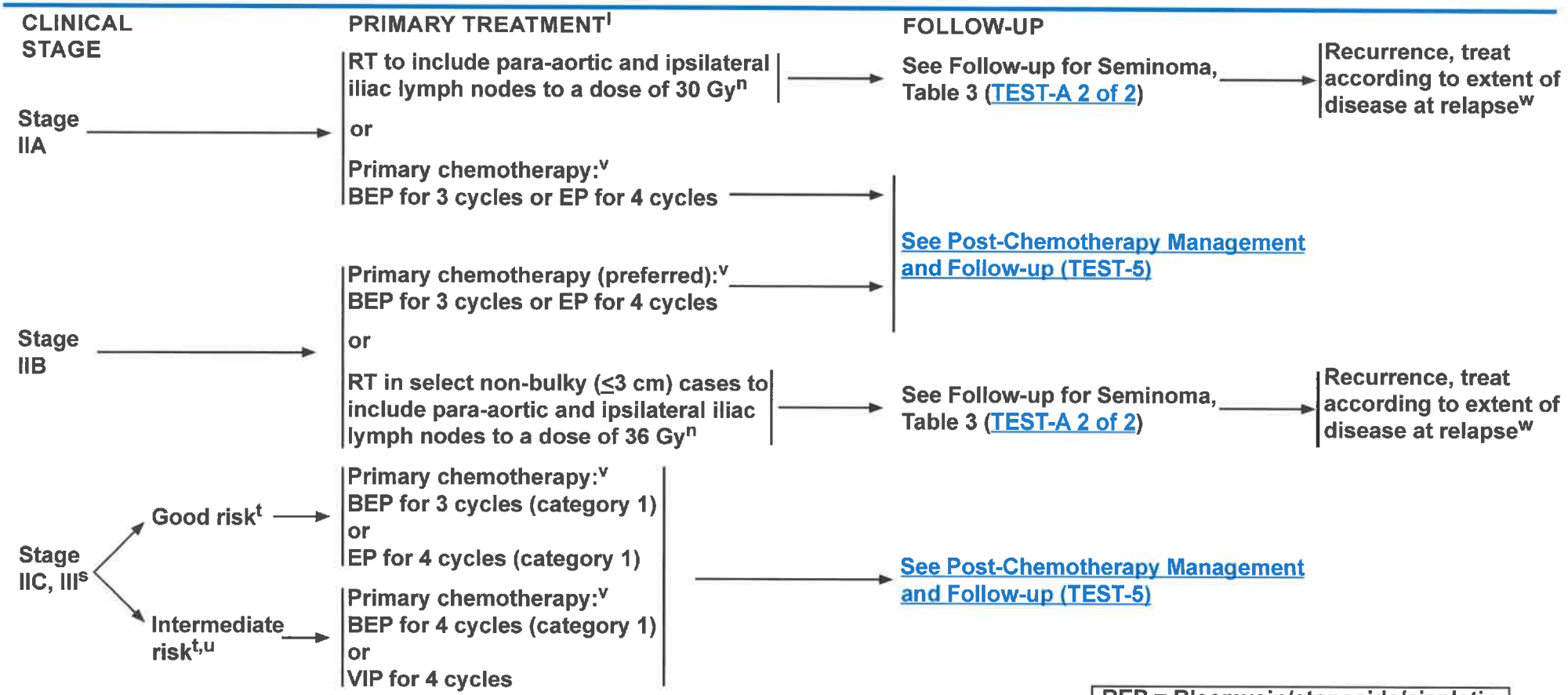

BEP = Bleomycin/etoposide/cisplatin
EP = Etoposide/cisplatin
VIP = Etoposide/ifosfamide/cisplatin

[l] Discuss sperm banking prior to chemotherapy or radiation treatment.

[n] See Principles of Radiotherapy for Pure Testicular Seminoma (TEST-C).

[s] All stage IIC and stage III seminomas are considered good-risk disease except for stage III disease with non-pulmonary visceral metastases (eg, bone, liver, brain), which is considered intermediate risk.

[t] See Risk Classification for Advanced Disease (TEST-D).

[u] Intermediate risk in seminoma is based on metastases to organs other than the lungs (stage IIIC). Stage IIIB does not apply to pure seminomas. Patients with elevated AFP have nonseminomas and patients with a serum bHCG above 1000 IU/L are also generally presumed to have a nonseminoma. LDH should not be used to stage or risk stratify patients with pure seminoma.

[v] See Primary Chemotherapy Regimens for Germ Cell Tumors (TEST-E).

[w] Patients should not be treated based only upon an elevated LDH.

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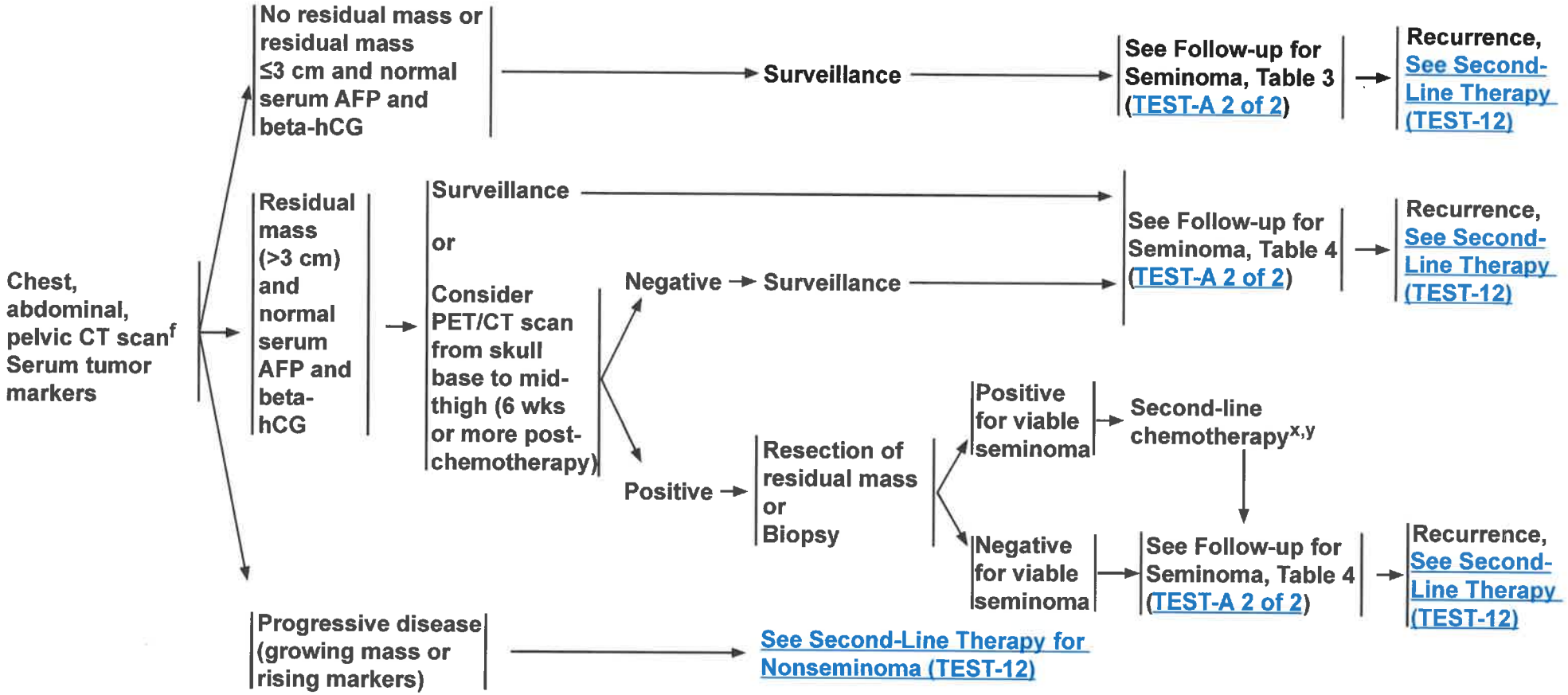
STAGE IIA, IIB, IIC, III AFTER PRIMARY TREATMENT WITH CHEMOTHERAPY

POST-CHEMOTHERAPY MANAGEMENT

FOLLOW-UP



[f] With contrast.

[x] See Second-Line Chemotherapy Regimens for Metastatic Germ Cell Tumors (TEST-F).

[y] If complete resection of all residual disease, consider chemotherapy for 2 cycles (EP or TIP or VIP/VeIP). If resection incomplete, full course of second-line therapy is recommended (see TEST-12). If a biopsy is performed and is positive, consider surgery if complete resection is possible or full course of second-line chemotherapy.

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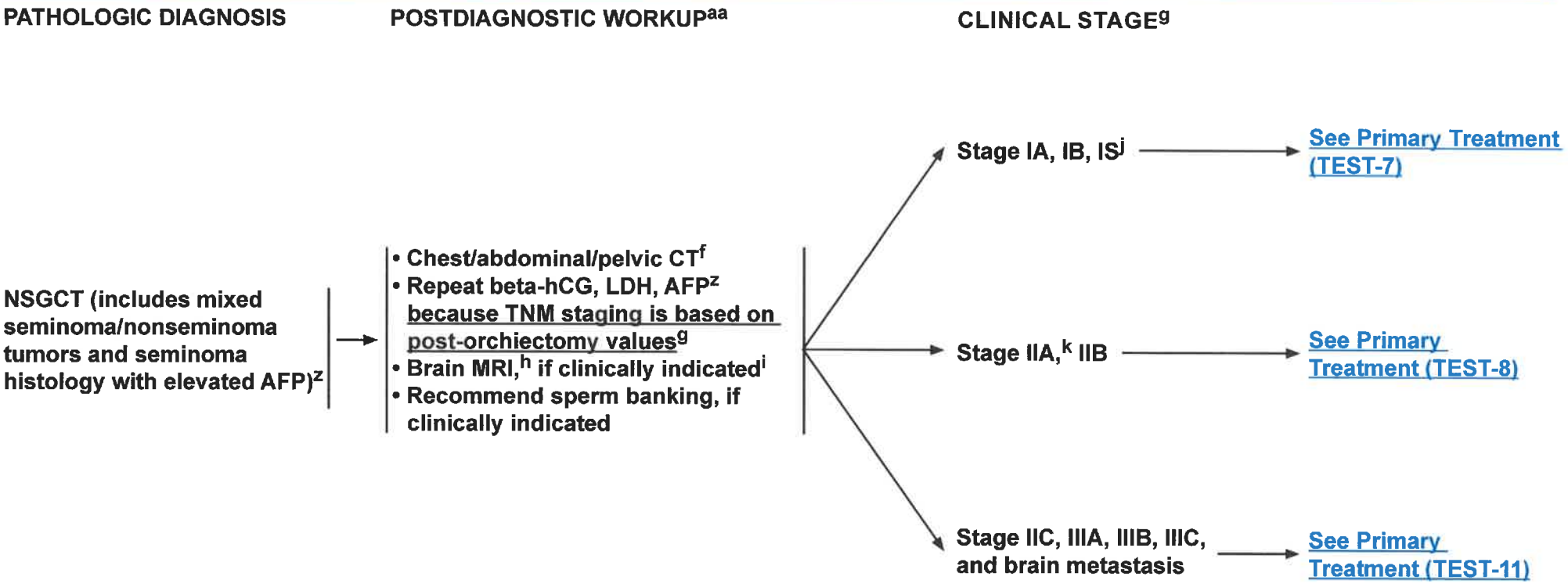

[f]With contrast.
[g]Elevated values should be followed after orchiectomy with repeated determination to allow precise staging. Follow declining markers until normalization or plateau. Staging is based on marker levels at the time that the patient starts postorchiectomy therapy (for example, for patients starting chemotherapy for disseminated disease, prognostic category and staging should be assigned based on the serum tumor marker levels on day 1 of cycle 1 of chemotherapy).
[h]With and without contrast.
[i]Eg, beta-hCG >5000 IU/L, extensive lung metastasis, choriocarcinoma, neurologic symptoms, non-pulmonary visceral metastasis, or AFP >10,000 ng/mL, choriocarcinoma, neurologic symptoms, non-pulmonary visceral metastasis, or AFP >10,000 ng/mL.
[j]The panel recommends using the AJCC Staging 7th edition for subclassifying and making treatment decisions about stage I tumors. (See ST-1 and ST-2)
[k]For select cases of clinical stage IIA disease with borderline retroperitoneal lymph nodes,waiting 4–6 weeks and repeating imaging (chest/abdomen/pelvic CT with contrast) to confirm staging before initiating treatment can be considered.
[z]Mildly elevated AFP levels may not indicate presence of germ cell tumor. Decisions to treat should not be based on AFP values <20 ng/mL.
[aa]PET/CT scan is not clinically indicated for nonseminoma.

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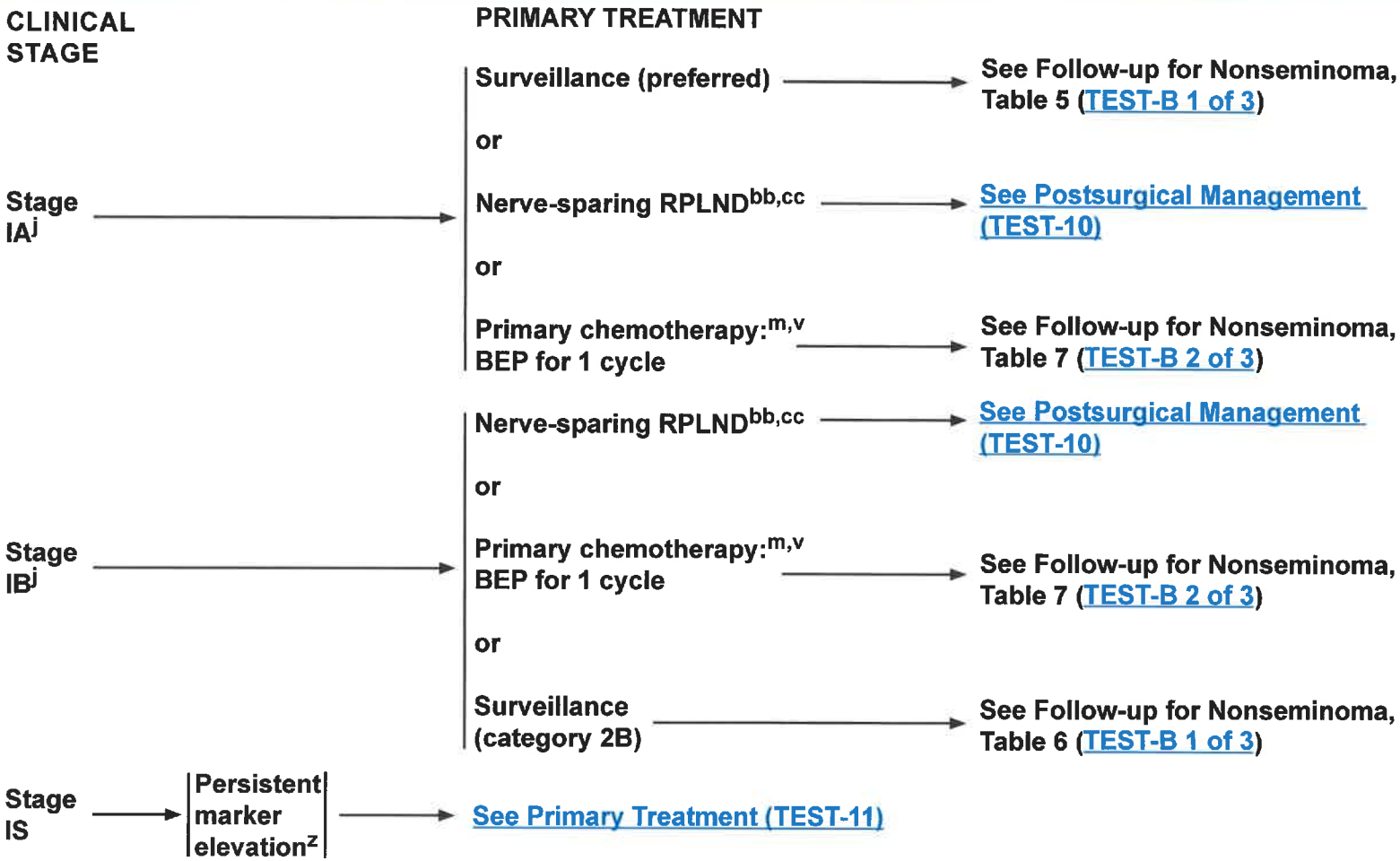

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[m]Recommend chest/abdomen/pelvic CT scan within the 4 weeks prior to the initiation of chemotherapy to confirm staging, even if scan was done previously.
[v]See Primary Chemotherapy Regimens for Germ Cell Tumors (TEST-E).
[z]Mildly elevated AFP levels may not indicate presence of germ cell tumor. Decisions to treat should not be based on AFP values <20 ng/mL.
[bb]Retroperitoneal lymph node dissection (RPLND) is recommended within 4 weeks of CT scan and 7–10 days of markers.
[cc]See Principles of Surgery for Germ Cell Tumors (TEST-H).

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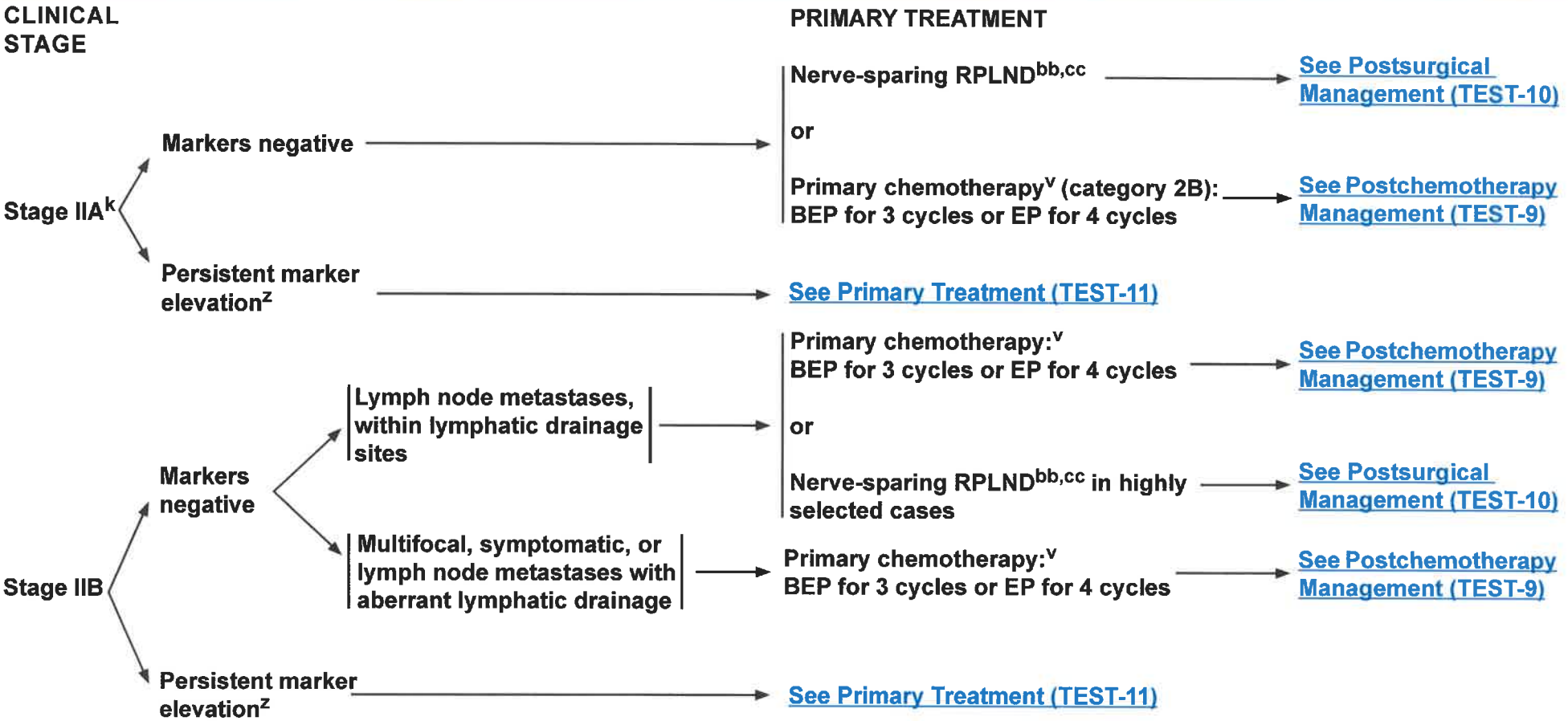

BEP = Bleomycin/etoposide/cisplatin
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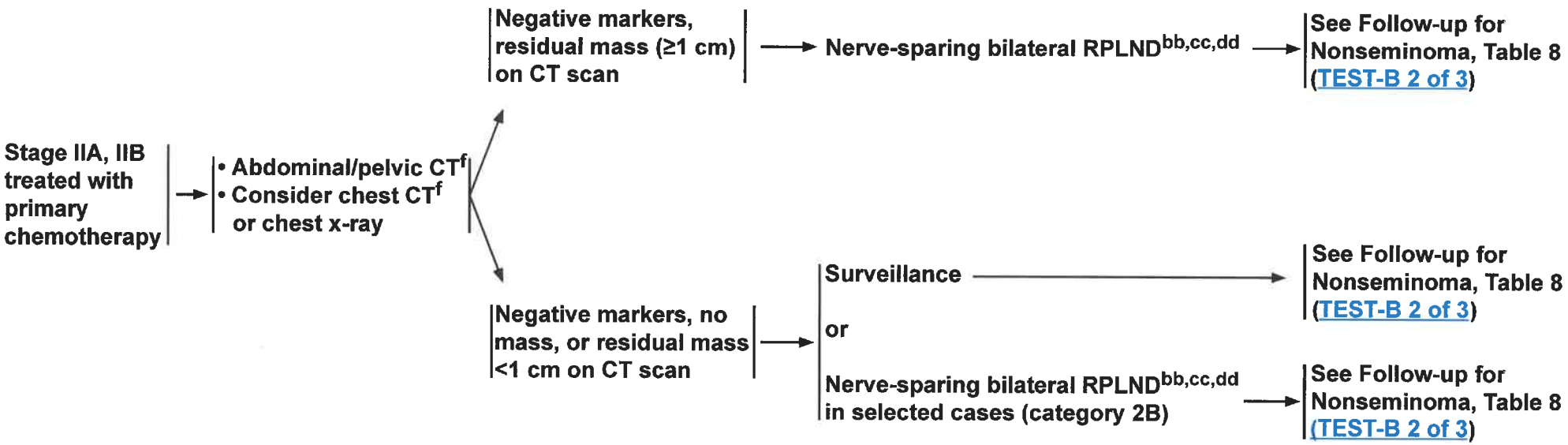
POSTCHEMOTHERAPY MANAGEMENT



[f]With contrast.
[bb]Retroperitoneal lymph node dissection (RPLND) is recommended within 4 weeks of CT scan and 7–10 days of markers.
[cc]See Principles of Surgery for Germ Cell Tumors (TEST-H).
[dd]Referral to high-volume centers should be considered for surgical resection of masses post-chemotherapy.

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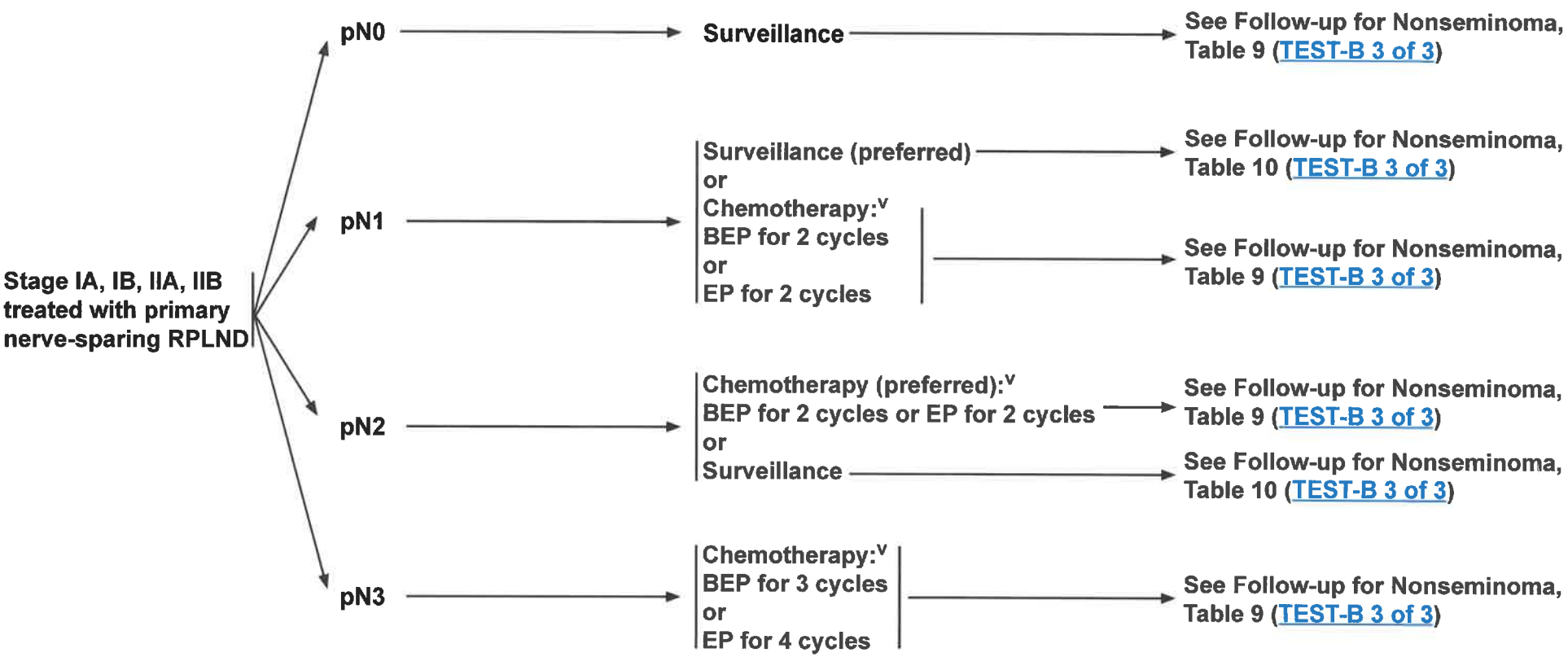
POSTSURGICAL MANAGEMENT



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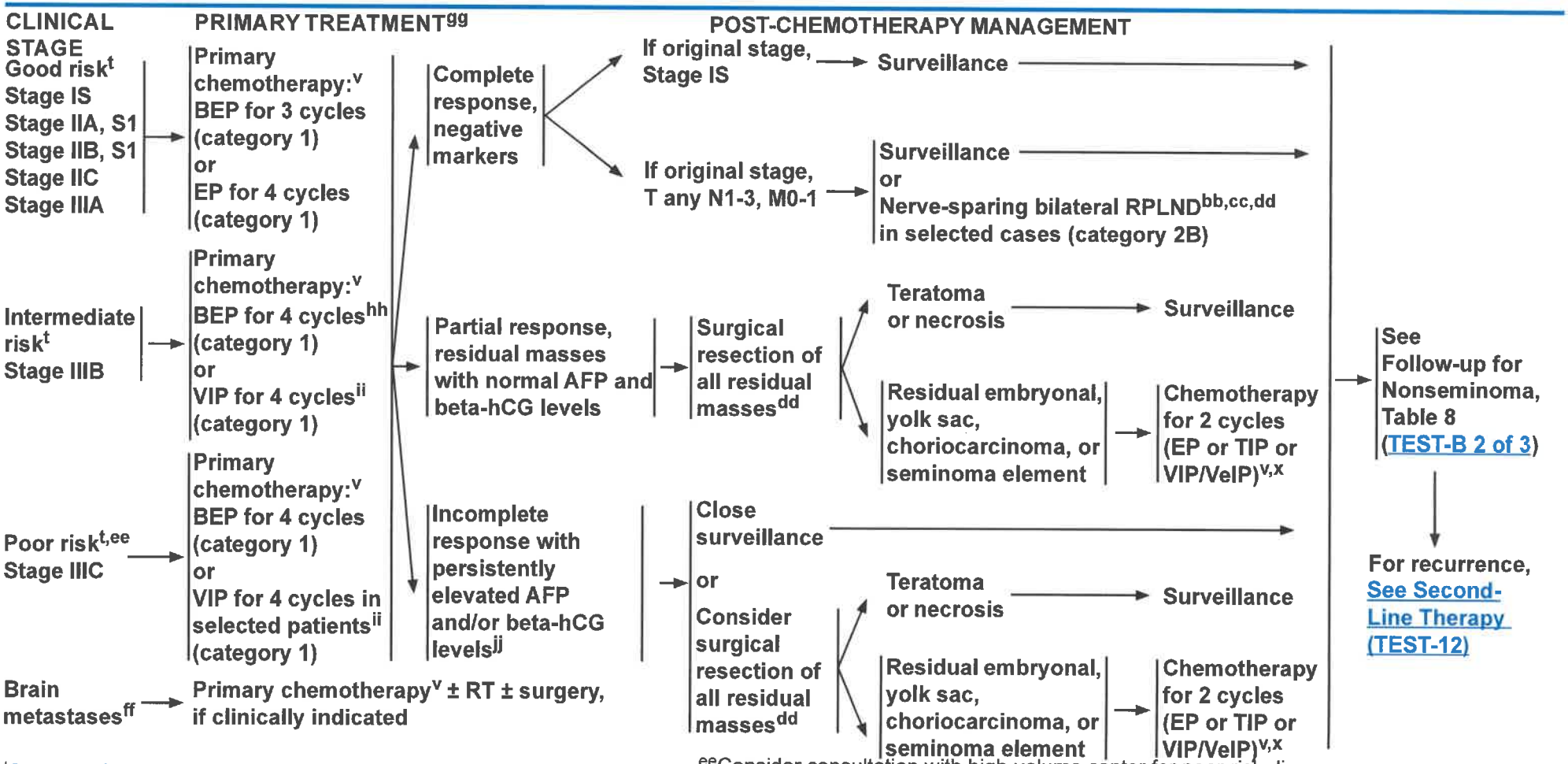

[t] See Risk Classification for Advanced Disease (TEST-D).
[v] See Primary Chemotherapy Regimens for Germ Cell Tumors (TEST-E).
[x] See Second-Line Chemotherapy Regimens for Metastatic Germ Cell Tumors (TEST-F).
[bb] Retroperitoneal lymph node dissection (RPLND) is recommended within 4 weeks of CT scan and 7–10 days of markers.
[cc] See Principles of Surgery for Germ Cell Tumors (TEST-H).
[dd] Referral to high-volume centers should be considered for surgical resection of masses post-chemotherapy.
[ee] Consider consultation with high-volume center for poor-risk disease.
[ff] Patients should receive adequate treatment for brain metastases, in addition to cisplatin-based chemotherapy.
[gg] To assess response after treatment, CT with contrast of chest/abdominal/pelvic + any other sites of disease is recommended.
[hh] If Intermediate risk is based on LDH 1.5–3 times the upper limit of normal, then BEP for 3 cycles can be considered.
[ii] Patients who may not tolerate bleomycin.
[jj] Salvage chemotherapy should be reserved for patients with rising AFP, beta-hCG, or other evidence of progressive disease.

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RECURRENCE[kk]

Prior chemotherapy

Favorable prognosis:[ll]
- Low markers
- Low volume
- Complete response on first-line therapy
- Testis primary

→ **SECOND-LINE THERAPY[gg,mm]**
- Clinical trial (preferred)
- Chemotherapy[x]
  - Conventional-dose therapy (VeIP or TIP)
  - High-dose chemotherapy
- Recommend sperm banking if clinically indicated

Unfavorable prognosis:[ll]
- Incomplete response
- High markers
- High volume
- Extratesticular primary

→
- Chemotherapy[x]
  - Clinical trial (preferred)
  - Conventional-dose therapy (VeIP or TIP) or
  - High-dose chemotherapy
- Consider surgical salvage if solitary site
- Recommend sperm banking if clinically indicated

Late relapse (recurrence >2 years after completion of primary treatment)

→
- Surgical salvage, if resectable (preferred)
- Chemotherapy[x]
  - Conventional-dose therapy (VeIP or TIP)
  - High-dose chemotherapy
- Recommend sperm banking if clinically indicated

→ Post Second-Line Therapy (TEST-13)

No prior chemotherapy → Treat per risk status on TEST-11 and Recommend sperm banking

[x] See Second-Line Chemotherapy Regimens for Metastatic Germ Cell Tumors (TEST-F).

[gg] To assess response after treatment, CT with contrast of chest/abdominal/pelvic and any other sites of disease is recommended.

[kk] It is preferred that patients with recurrent nonseminoma be treated at centers with expertise in the management of this disease.

[ll] Examples of systems used to estimate prognosis are: 1) Fossa SD, Cvancarova, et al. J Clin Oncol 2011;29:963-970; 2) Fedyanin M, Tryakin A, Kanagavel D, et al. Urol Oncol 2013;31:499-504; and 3) Masterson TA, Carver BS, Shayegan B, et al. Urology 2012;79:1079-1084.

[mm] Includes best supportive care.

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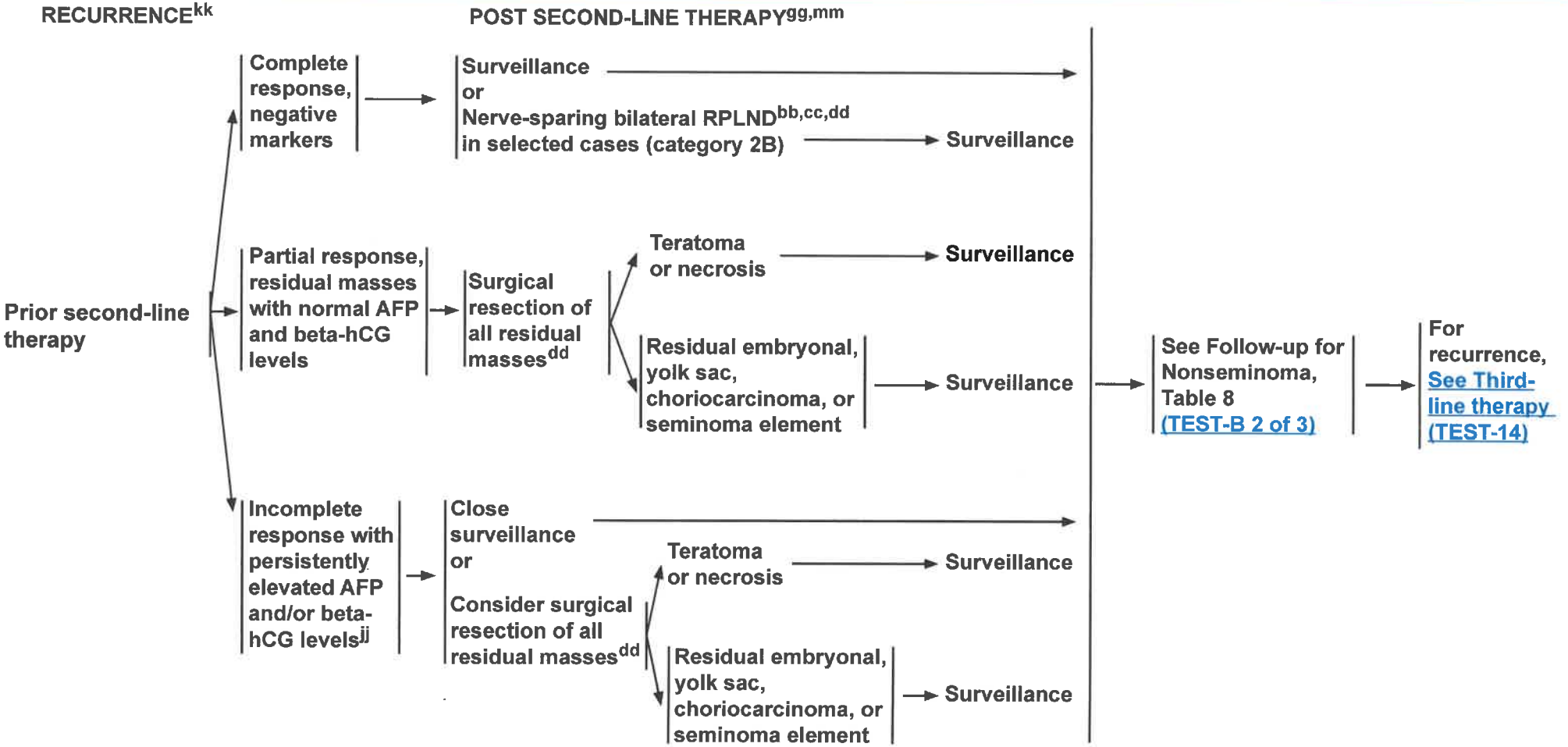

[bb]Retroperitoneal lymph node dissection (RPLND) is recommended within 4 weeks of CT scan and 7–10 days of markers.

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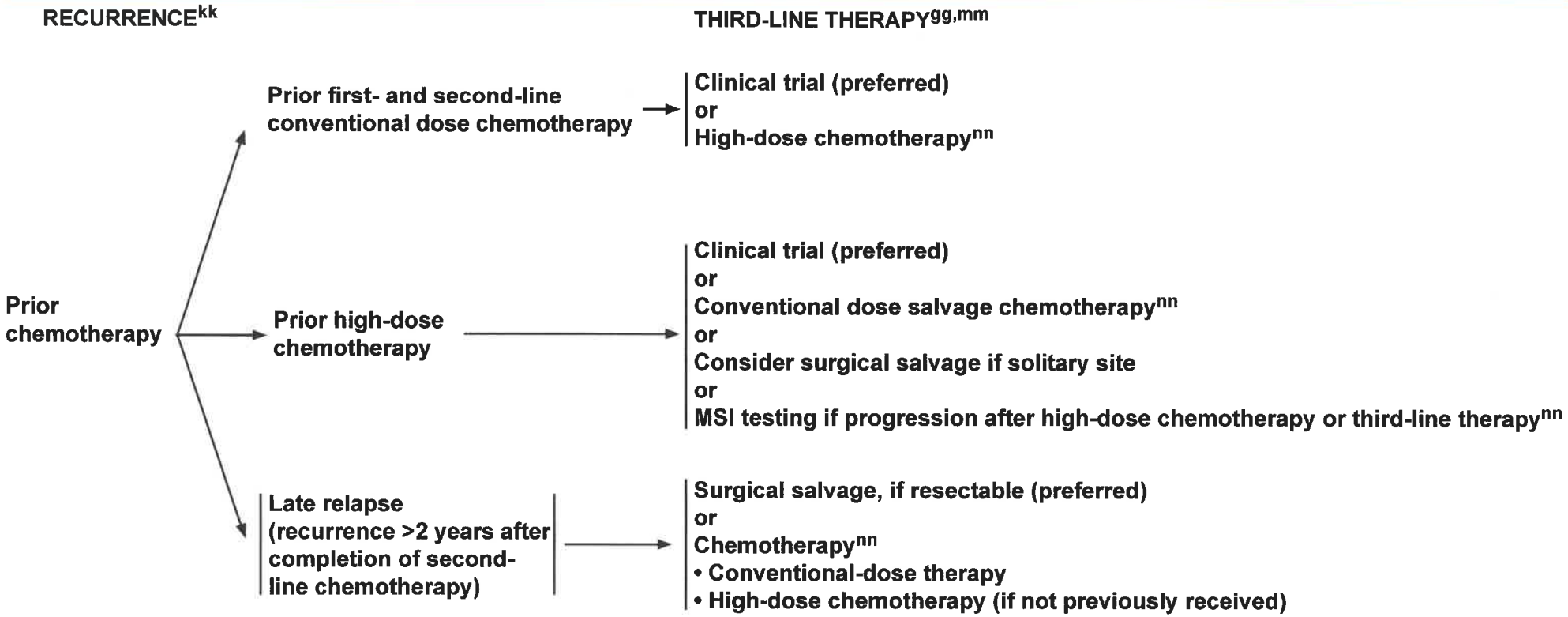

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[mm]Includes best supportive care.
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