

# Understanding Invasive Bladder Cancer

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# Bladder Cancer Staging: T Stage

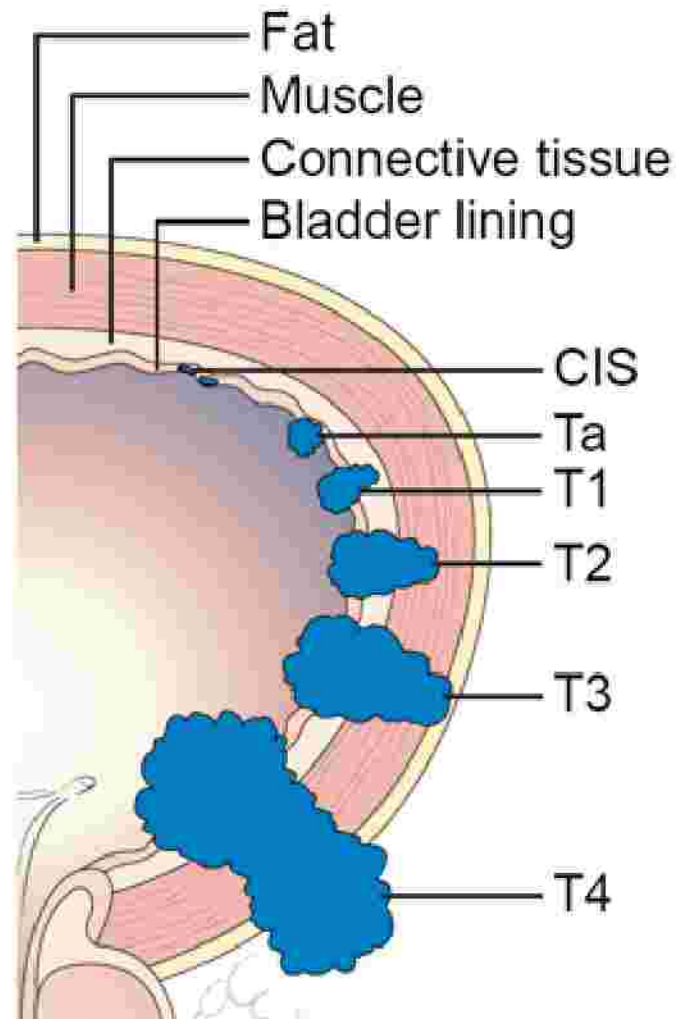


Diagram showing the T stages of bladder cancer  
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# Bladder Cancer: 2009 US Data

- 70,980 New Cases
  - 52,810 male
  - 18,170 female
  - 20-40% (16,000-32,000) will present with invasive (T2) dz or will develop it
- 14,330 Deaths
  - 10,180 males (8<sup>th</sup> most common cause of cancer death)
  - 4,150 females (11<sup>th</sup> most common)

# Management of T2 (Stage II) Bladder Cancer

- Radical Cystectomy +/- Chemotherapy
  - Standard in US
- Bladder Sparing:
  - External Radiation Therapy Combined with Chemotherapy
  - Partial Cystectomy
  - Transurethral Resection

# Radical Cystectomy: Gold Standard

- Overall Survival: 50-60%
- Survival by Pathologic Stage:
  - pT0-2, N0: 70-80%
  - pT3-4, N0: 45-55%
  - pTany, N1-3: 25-35%
- Outcomes Largely Unchanged x 30 years

# Radical Cystectomy: Often Too Late

	pT0-2	pT3-4	pN1-2
MSKCC, USA	52%	48%	22%
USC, USA	51%	49%	23%
Bern, SUI	48%	52%	24%
Leissner et al., GER	52%	48%	28%
Shariat et al., USA	57%	43%	23%
Herr et al., USA	55%	45%	20%

# Radical Cystectomy: Optimizing Patient Outcomes

- “Timely” Cystectomy
- Quality of Radical Cystectomy
  - Extended Pelvic Lymph Node Dissection
- Peri-Operative Chemotherapy
- Improve Morbidity and Quality of Life

# “Timely” Cystectomy

- Cystectomy within 3 months of T2 Diagnosis Increases Survival
- Early Cystectomy for T1, TaHG, CIS

Lee CT et al 2006 J Urol 175:1262

Chang SS et al 2003 J Urol 170:1085

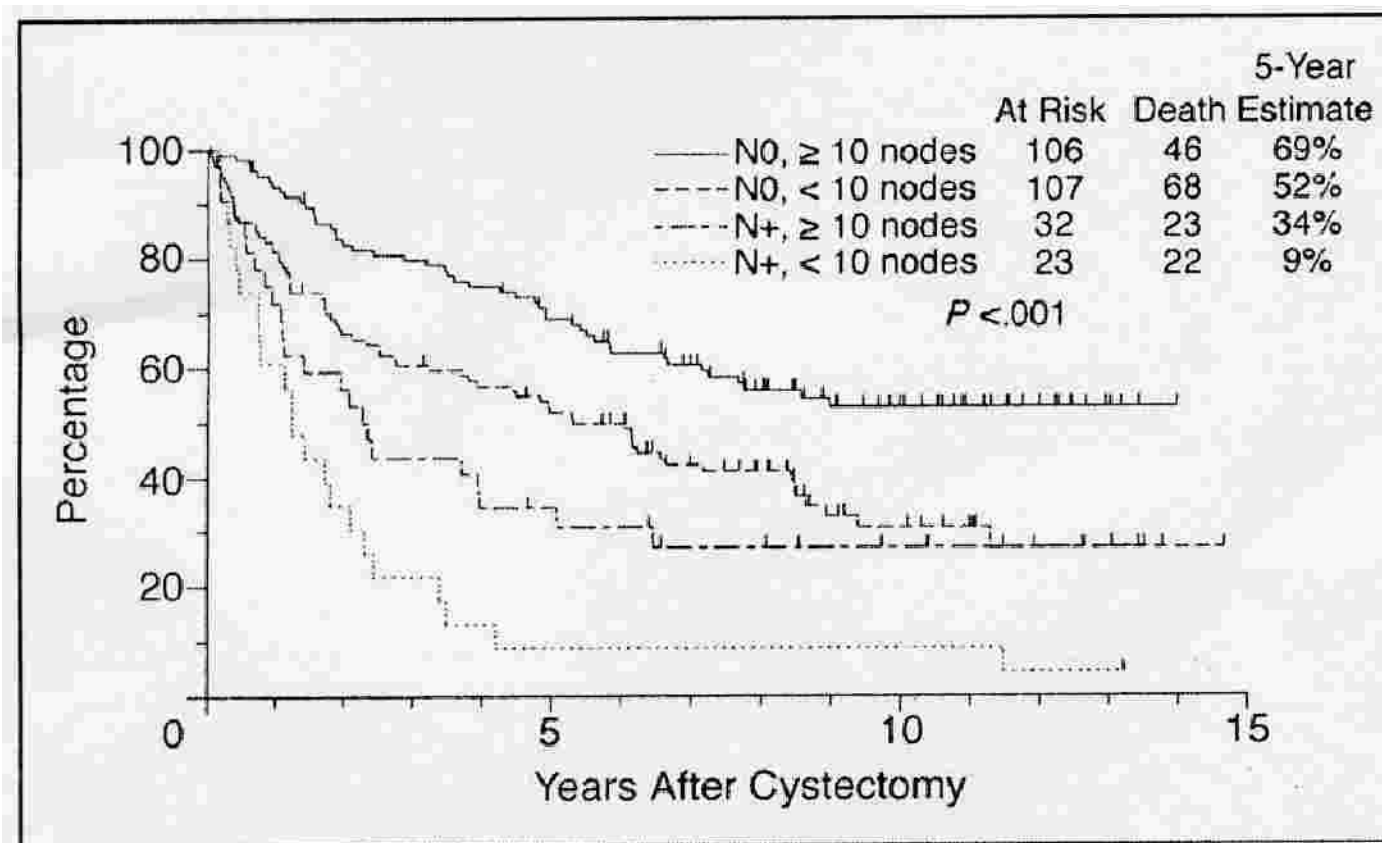
# Quality of Cystectomy: SWOG 8710

- 1987-1998, 106 surgeons
  - 38% fellowship-trained urologic oncologists
- PLND:
  - 9% No PLND
  - 50% cases < 10 nodes removed
- Positive surgical margins: 10%
  - 4% urologic oncologist, 16% other
- Local recurrence:
  - 6% urologic oncologist, 23% other

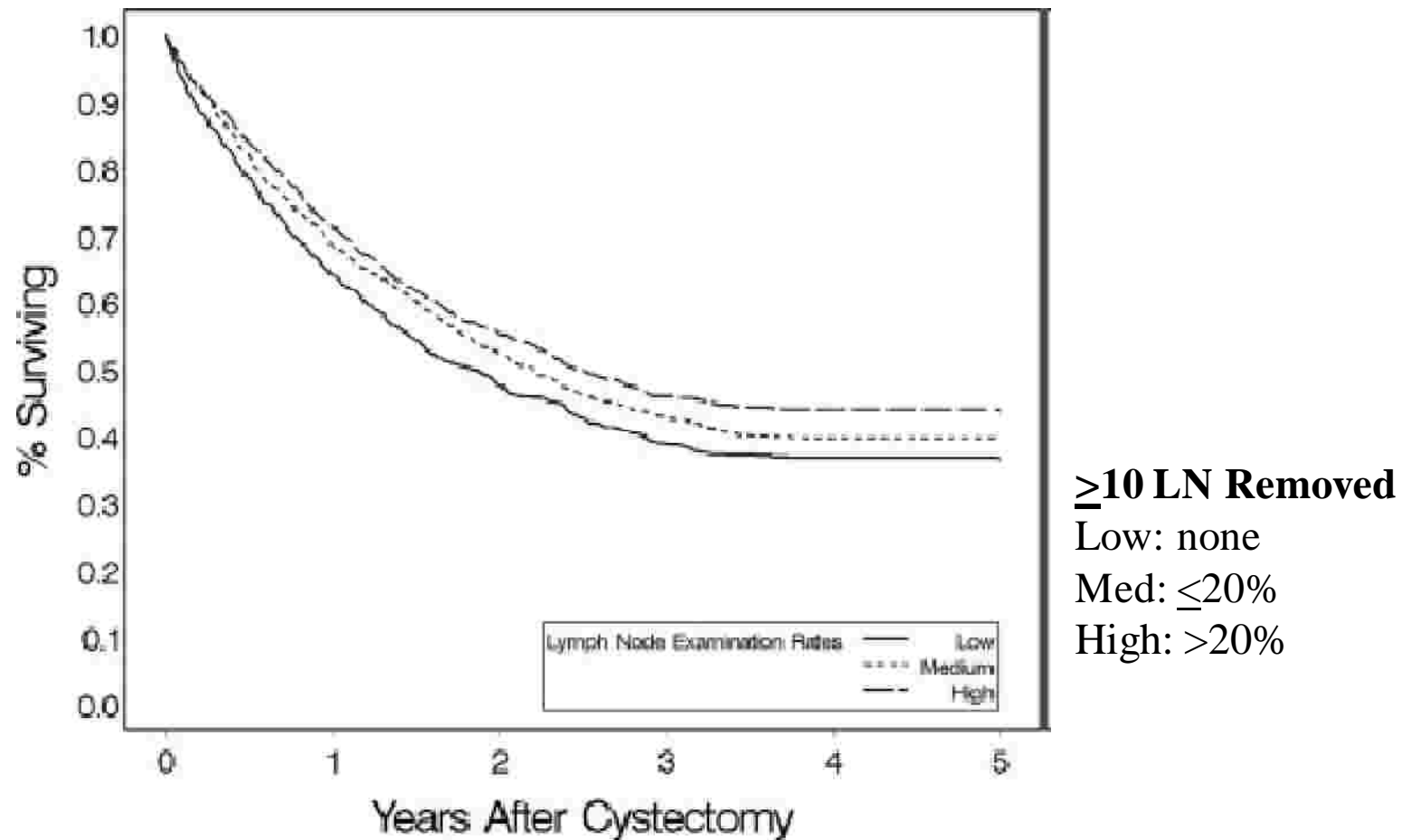
Type of surgeon was a significant predictor of survival, local recurrence, number of nodes removed

# Quality of Cystectomy: SWOG 8710

- Quality of Pelvic Lymph Node Dissection



# Quality of Cystectomy: Hospital Volume



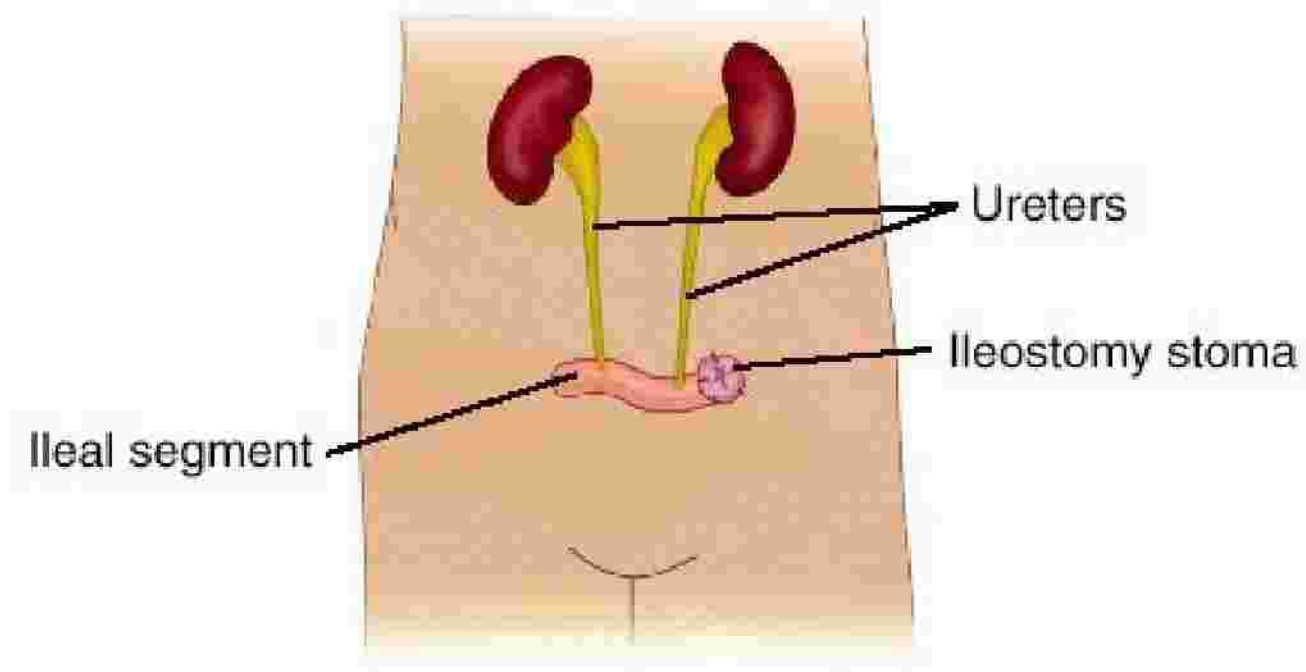
# Quality of Cystectomy

- Surgeon/Hospital Experience:
  - More cystectomies
  - More lymph nodes removed
  - Lower positive margins
- Higher survival

# Urinary Diversion: Goals

- Replace Bladder Function
- Maintain Control of Bladder Storage and Emptying
- Preserve Renal Function
- Unimpaired Quality of Life

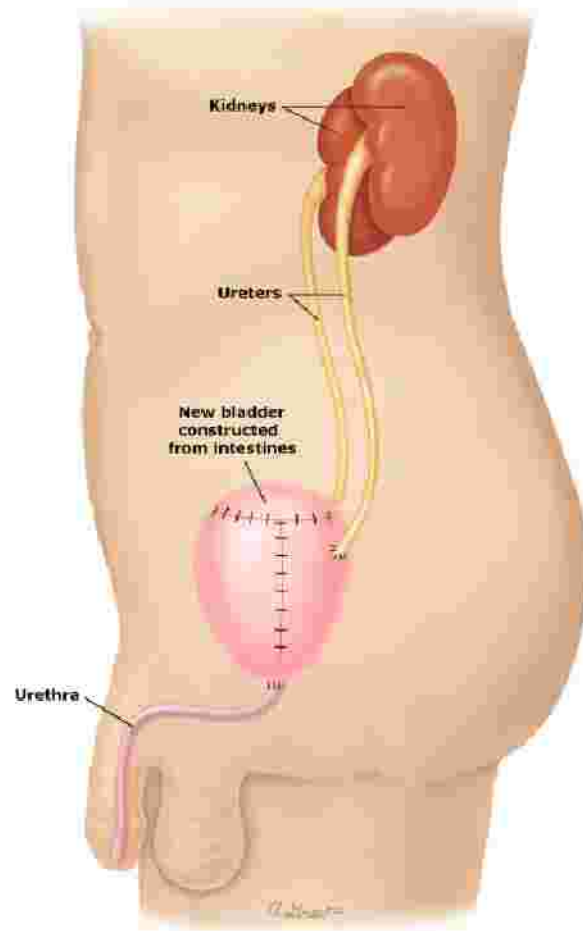
# Urinary Diversion: Ileal Conduit



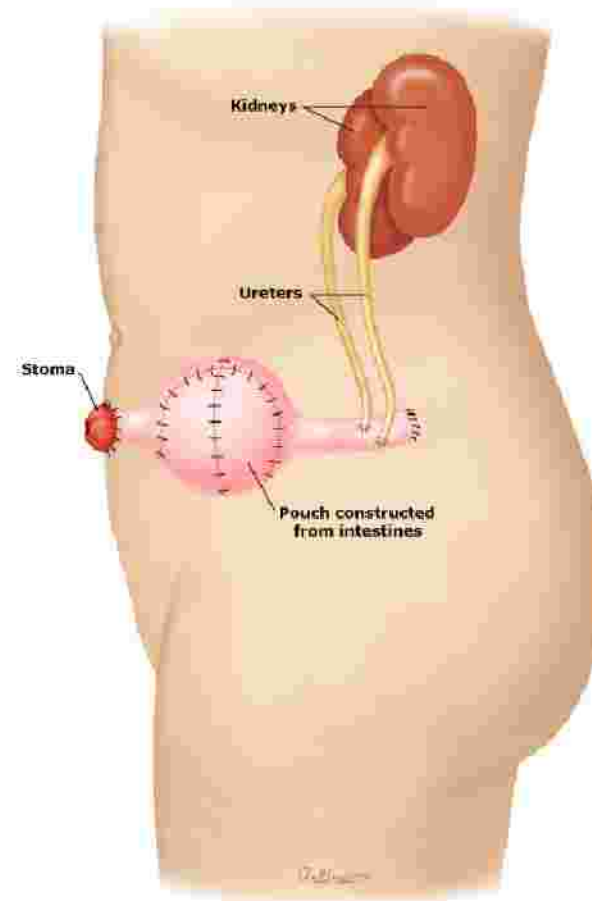
# Urinary Diversion: Ileal Conduit

- Advantages:
  - Least complicated
  - Shortest operative times
  - Least complications
- Disadvantages:
  - Complications of incontinent stoma
    - Appliance

# Urinary Diversion: Continent Diversion



Ileal Neobladder

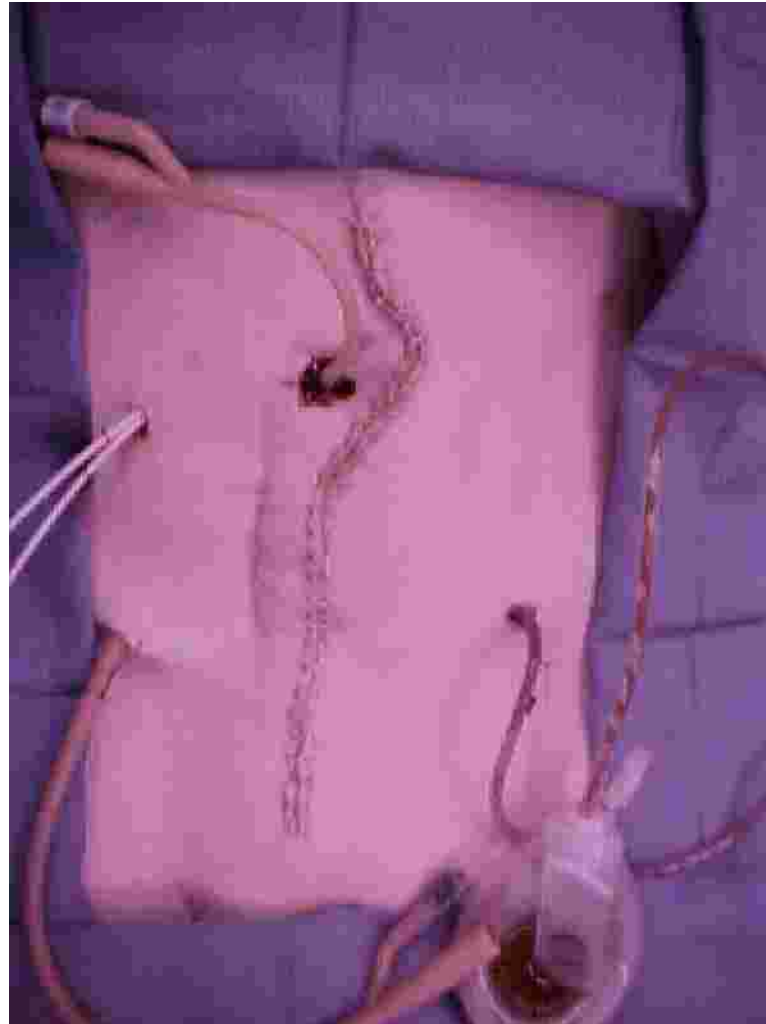


Indiana Pouch

# Ileal Neobladder: Post-Op



# Indiana Pouch: Post-Op



# Urinary Diversion: Continent Diversion

- Absolute contraindications:
  - Renal impairment (creatinine >2.0)
  - Severe hepatic dysfunction
  - Compromised intestinal function
    - Inflammatory bowel disease
    - Significant bowel resection
- Contraindications to orthotopic neobladder:
  - Cancer at distal urethral margin
  - External sphincter dysfunction
  - Urethral stricture disease

# Urinary Diversion: Continent Diversion

- Also need to consider:
  - Cognitive status
  - Manual dexterity
- 60-80% pts estimated to be candidates for continent diversion
- Patient selection
  - Patient preference

# Urinary Diversion: Continent Diversion

- Orthotopic neobladder complications:
  - Daytime incontinence: 10-15%
  - Nighttime incontinence: 20-30%
  - Urinary retention requiring CIC: 10%
  - Other:
    - Ventral incisional hernia
    - Neobladder fistula to rectum, vagina, intestine
    - Neobladder rupture, bladder neck contracture
- Continent cutaneous pouch complications:
  - Stomal stenosis/stomal incontinence
  - Bladder stones

# Urinary Diversion: QOL

- Health related quality of life
  - Attempt to objectively assess pt perception of their own health and ability to function
- Urinary diversion considerations:
  - Stomal maintenance, catheter use, incontinence, body image, sexual function
- No definitive differences in QOL between diversions
  - most pts would still select same urinary diversion

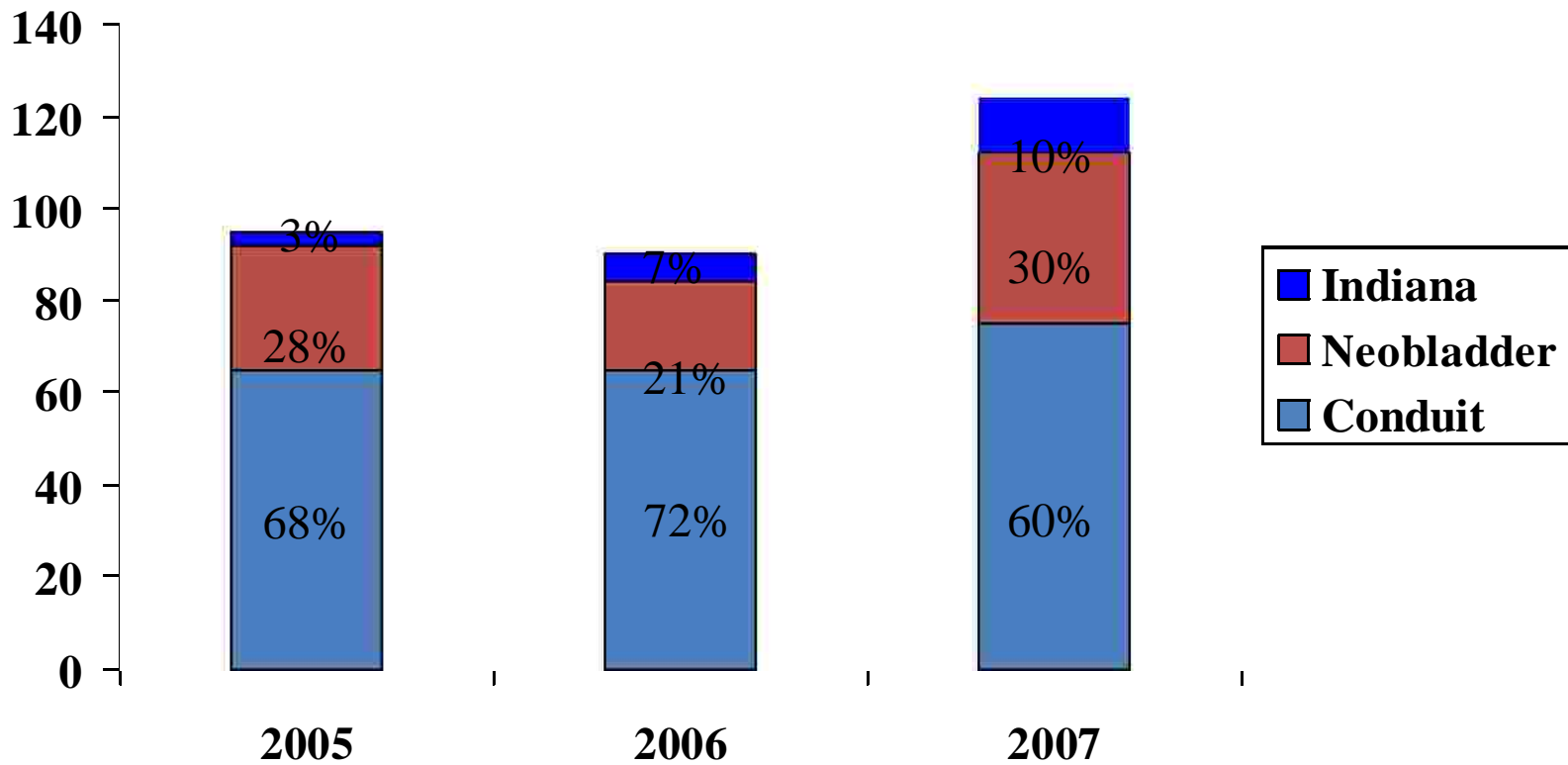
# Urinary Diversion: US Statistics

- US Medicare and SEER Data
  - 3600 pts underwent radical cystectomy
  - 1992-2000
  
  - Conduit: 80%
    - Older age
    - African-American
    - Higher comorbidity index
  - Continent diversion: 20%
    - Male sex
    - Higher education level
    - Year of surgery
    - Treatment at academic and NCI-designated cancer center
    - Treatment by high volume providers

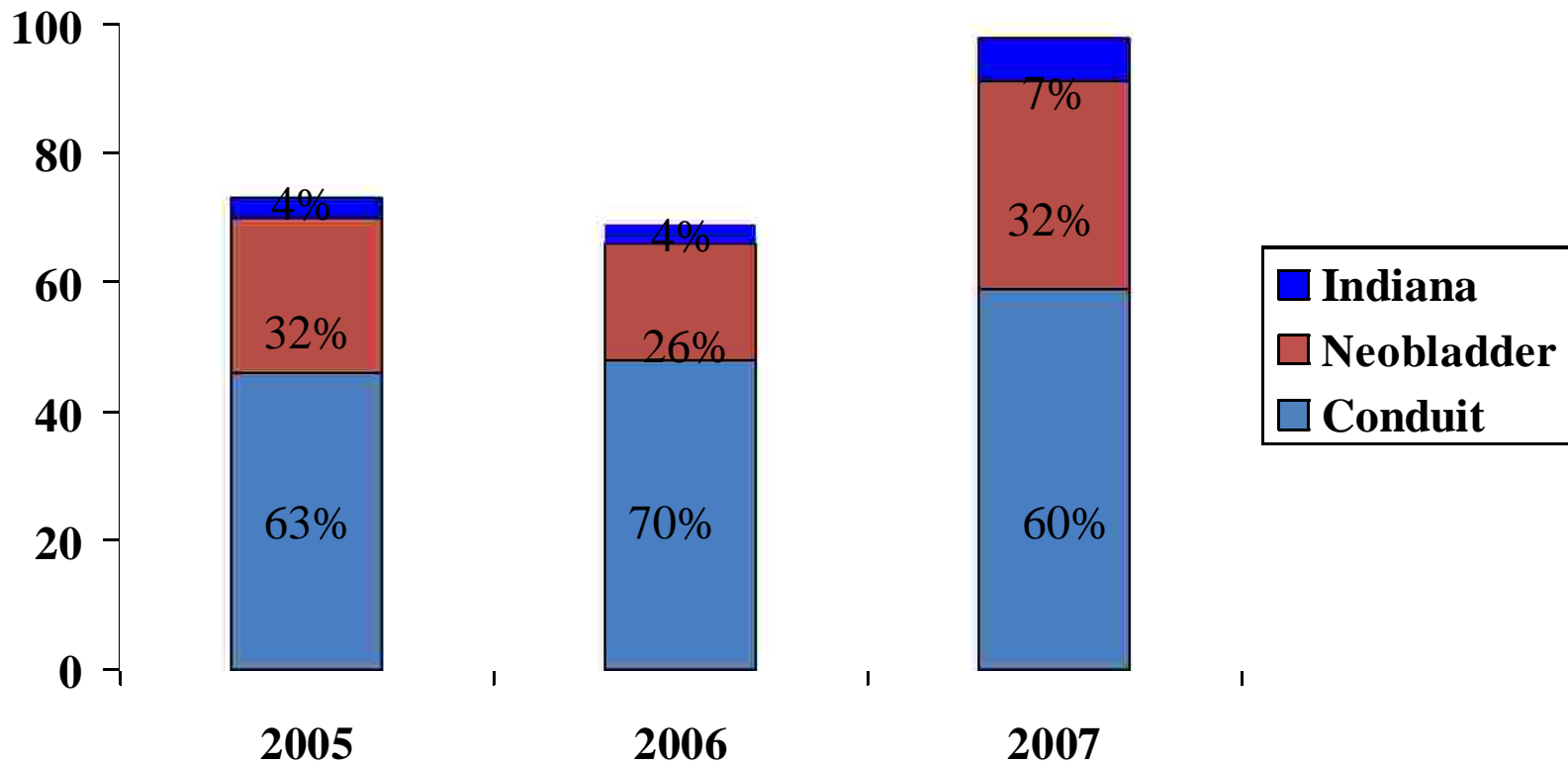
# Urinary Diversion: Regionalization

- Referral to specialized high volume centers
  - Increased efficiency, cumulative experience
- Decreased mortality from cystectomy:
  - Hospital volume >11/yr: 3% vs 5%
  - Surgeon volume >3.5/yr: 3% vs 5%
- 70% of pts undergoing cystectomy in US were at centers performing <11 per year

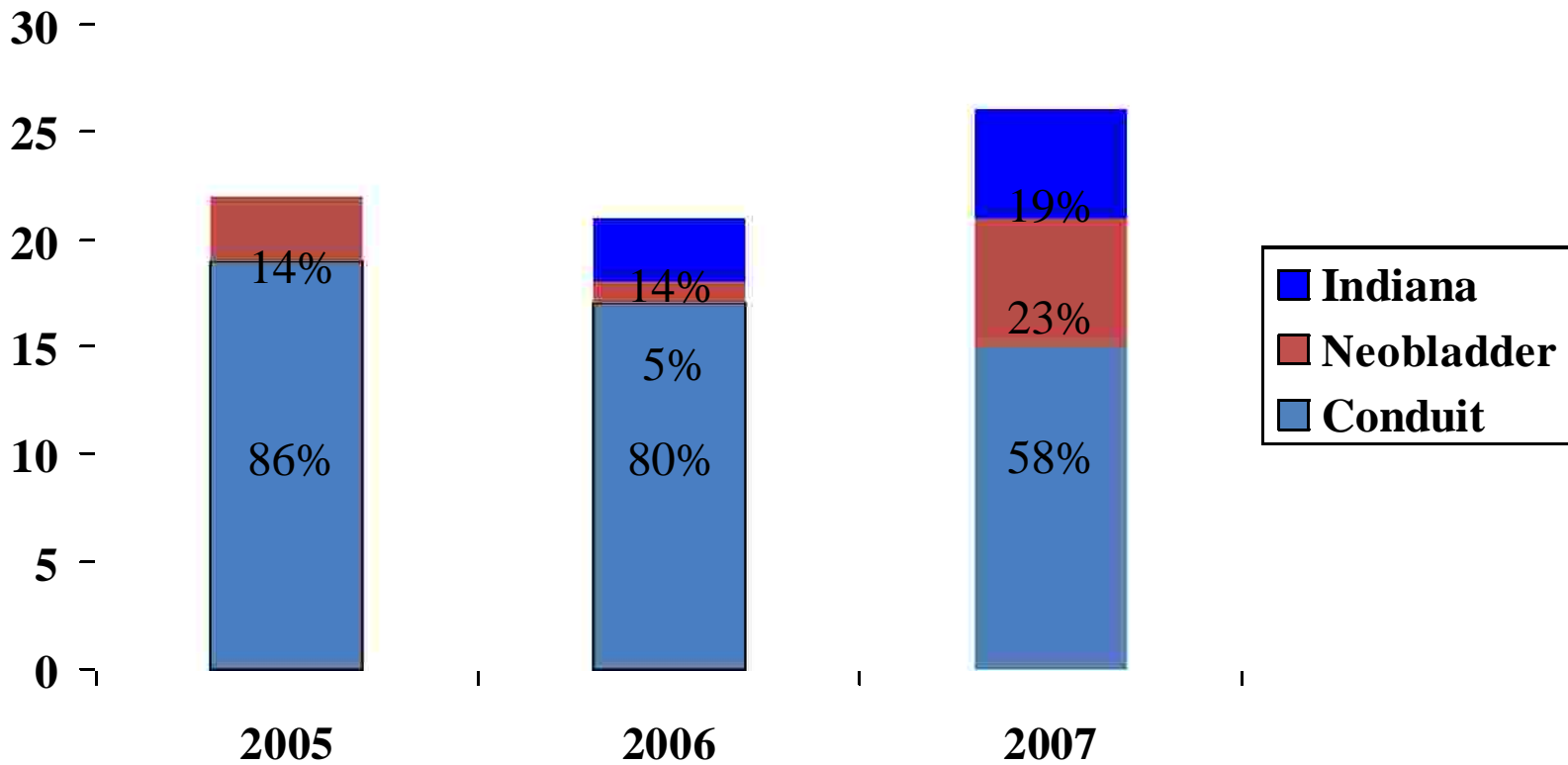
# Cleveland Clinic Bladder Cancer Urinary Diversion



# Cleveland Clinic Bladder Cancer Urinary Diversion: Male



# Cleveland Clinic Bladder Cancer Urinary Diversion: Female



# Urinary Diversion: Future

- Tissue engineering autologous bladders
- Collagen polyglycolic acid scaffold
- Pts bladder cells seeded into scaffold
- Tissue culture
- Anastomose to native bladder
- Increased bladder capacity with decreased bladder pressures
- Potential seeding with urothelial carcinoma cells
- Acontractile, insensate bladder

# Urinary Diversion: Conclusion

- Urinary diversion choice:
  - Pt selection
  - Few contra-indications to continent diversion
  - Quality of life preserved
- Regionalization
  - Decreased morbidity and mortality
  - More equal access

# Radical Cystectomy: Conclusions

- Timely Cystectomy: within 3 months
- Quality of Cystectomy
  - Surgeon/Hospital Experience
  - Pelvic Lymph Node Dissection Improves Survival
    - Pts with LN + disease
    - Pts with LN - disease
  - Number of Lymph Nodes Removed: More is Better
- Peri-Operative Chemotherapy
- Quality of Life
  - Urinary Diversion
  - Minimally Invasive Cystectomy