The Main Points

PART I
- Types of cancer and the treatment that affects urogenital, bowel, pelvic floor, and sexual function
- Identifying urogenital, bowel, pelvic floor, and sexual symptoms
- Asking the right questions
- Physical therapy treatment and recommendations that can reduce symptoms

PART II
- Chart review and clinical decision making
- Asking the right questions and making judgment calls
- Physical therapy treatment; recommendations
- Physical Therapy as part of multi-disciplinary oncology team

Learning Points

Following this presentation you will be able to:
- Recognize common bowel and bladder, pelvic floor and sexual impairments caused by cancer surgery and treatment.
- Provide basic education and treatment for bowel and bladder dysfunction.
- Know when to refer to the appropriate Pelvic Health or Lymphedema provider in your area

Breast Cancer

Breast cancer is the most common cancer among women.

Risks for developing long-term side effects after treatment include:
- Age
- BMI
- Type, dose, and duration of treatment

Cancer And Its Treatment May Cause Urogenital, Bowel, Pelvic Floor & Sexual Dysfunction

Breast
Prostate
Colorectal
Anal
Uterine
Cervical
Ovarian
Testicular

Chemotherapy
Colostomy &/or Ostomy
Hormonal Therapy
Immune Modulators
Radiation Therapy
Surgery
Common Gynecologic Side Effects from Hormonal Chemotherapy for Breast Cancer

- Vaginal atrophy (VA)
- Accelerated drop in estrogen causes:
  - Decreased blood flow to lamina propria contributes to vaginal dryness, reduced tissue elasticity, decreased libido and dyspareunia
  - Bladder urgency, frequency
  - Increased risk of urinary tract infections (UTIs)
- Pain with vaginal intercourse
- Hot flashes
- Bone loss/osteoporosis

Side Effects After Total Abdominal Hysterectomy & Bilateral Salpingo Oophorectomy for Premenopausal Women with Breast Cancer

Common
- Accelerated menopause with hot flashes, vaginal atrophy
- Bladder urgency and frequency
- Pain with intercourse
- Hot flashes

Less Common
- Levator Ani spasms
- Hypalgesia and allodynia (neuropathic dysfunction)
- Abdominal wall pain due to disruption of spinal nerves S2-S4

Pudendal Nerve
Bowel, Bladder, Sexual Dysfunction & Pain

Vaginal Atrophy, Bladder Spasms, Urgency

Pelvic Floor Response to Surgery & Treatment

Prostate Cancer

- Most industrialized countries have a high incidence of prostate cancer.
- Many variables determine how much function patients will be able to regain after surgery and treatment.
Variables That Affect Prostate Surgery

- **Baseline Factors**
  - Age
  - Prostate size, membranous urethral length
  - Body mass index (BMI)
  - Pre-existing lower urinary tract symptoms (LUTS)
  - History of transurethral resection prostate (TURP)

- **Anatomic Factors**
  - Placement and condition of the urethral sphincter complex
  - Supporting structures
  - Fibrosis, and nerve supply

Surgical Factors

- Impact of surgical dissection
- Damage to the neurovascular bundle
- Post operative fibrosis

Stages of Cancer

- TNM staging system
  - \( T \) = extent of original tumor
  - \( N \) = extent of spread to lymph nodes
  - \( M \) = presence of metastasis
  - \( a, b, c \), after \( T \) indicates how close tumor is to next size up
  - number after \( N \) tells how many nodes are positive
  - \( Mx \) = metastatic spread

After Effects of Prostate Surgery & Treatment

- **Post surgery**
  - Stress incontinence
  - Erectile dysfunction
  - Usually improves gradually post surgery; stabilizes in ~ 1 year

- **Radiation therapy**
  - Fecal urgency/incontinence
  - Proctitis (area inflammation)
  - Stenosis of the rectum
  - Urinary urgency, frequency, incontinence

- **Androgen deprivation therapy**
  - Increased risk for obesity, diabetes, cardiovascular disease
  - Increased bone loss
  - Vasomotor symptoms: hot flashes, night sweats

Bladder & Rectum in the Radiation Field

- Prostate Radiation Field
  - Bladder
  - Radiated lymph nodes
  - Vasomotor symptoms: hot flashes, night sweats
Colorectal Cancer

- Colorectal cancer is one of the most common cancers in the industrialized world.
- Third most common cancer in the United States
- Treatment
  - Surgery, chemotherapy, radiation, or concurrent chemoradiation,
  - Colostomy, Ostomy

Effects of Colorectal & Rectal Cancer Treatment

- Bowel and bladder incontinence
- Chronic diarrhea
- Excessive gas
- Rectal or vaginal stenosis
- Gut wall inflammation and fibrosis
- Proctitis
- Erectile and ejaculatory dysfunction in men
- Desire and orgasm difficulties in women
- Emotional Distress and/or depression

Cancer Found in Colonoscopy

Gut Wall Inflammation & Stricture
Anal Cancer

- Anal cancer accounts for about 2% of all cancers of the large bowel.
- More common in women
- Exact cause is unknown, but recognized associations include:
  - Human papilloma virus (HPV)
  - Immunodeficiency virus (HIV)
  - Sexual activity
  - Receptive anal intercourse in men
  - Compromised immune system
  - Cigarette smoking

Radiation Fields for Anal Cancer

<table>
<thead>
<tr>
<th>Imaging rectal cancer radiation fields</th>
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<tbody>
<tr>
<td>Portal image (x-ray image showing the area of radiation (light blue))</td>
</tr>
<tr>
<td>Computer generated radiation target (dark blue)</td>
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</tbody>
</table>

Targeted Chemoradiation Therapy for Anal Cancer

Intensity Modulated Radiation Therapy

**Anal Cancer Location**

**Post Treatment Proctitis**
Effects of Treatment for Anal Cancer

Acute and chronic side effects of concurrent chemoradiation or radiotherapy only:

- **Gastrointestinal**
  - Diarrhea
  - Rectal bleeding

- **Pelvic floor**
  - Radiation induced anal sphincter dysfunction
  - Fibrotic tissue

- **Dermatologic**
  - Radiation dermatitis in the rectal and vulvovaginal tissues
  - Skin ulceration and necrosis

- **Urinary**
  - Burning during urination
  - Urinary urgency
  - Stress incontinence

- **Sexual**
  - Vaginal stenosis
  - Erectile dysfunction (decrease in EF, but aids not needed. Erectile aids needed, aids not helpful needs penile prosthesis)

Cancers of the Cervix, Endometrium, Ovary

In 2012 cervical, endometrial and ovarian cancers ranked 4, 5, and 7 of female cancers worldwide. 1

Cancer survivors in a study by the University of New Mexico Health Sciences Dept of OB/GYN responded to the Pelvic Organ Prolapse/Urinary Incontinence Sexual questionnaire:

- 43% reported moderate fecal incontinence
- 42% had moderate to severe urinary incontinence
- Just under 30% said they had emotional reactions such as fear, disgust, shame and guilt
- 40% either had few or no orgasms with sexual intercourse
- Over 50% of reported that sexual activity was restricted by:
  - Prostate
  - Fear of fecal or urinary incontinence

Vaginal Scarring & Stenosis

Pelvic radiotherapy (RT) is associated with:

- Loss of fertility
- Vaginal atrophy
- Vaginal stenosis and fibrotic strictures
- Decreased elasticity and compliance of the rectum, decreased contractility of anal sphincter
- Fecal incontinence and urgency
- Urinary urgency, urinary incontinence (higher risk for cervical, and prostate)
- Proctitis
- Pain with vaginal intercourse
- Decreased libido
- Pelvic fractures in older women
- Lymphedema

Effects of RT may continue for months to years after treatment

Many patients will experience negative effects for at least 2 years after RT.

Questions to Ask Patients After Surgery, Chemotherapy, Radiation

**Female**

- Do you have:
  - Urinary urgency? Burning during / after urination?
  - Pain with sexual intercourse? Can use Mannah’s Sexual Dysfunction Scale
  - Decrease in orgasmic capacity? If through lubrication during intercourse?
  - Diaphragm Contraception? Pain with defecation?
  - Feeling of heaviness or pressure in the pelvis?

**Male**

- Do you have:
  - Erectile dysfunction?
  - Pain with sexual intercourse?
  - Urinary urgency? Burning during / after urination?
  - Diaphragm Contraception? Pain with defecation?
  - Proctitis, Rectal inflammation or tenesmus?

- Do you feel you would benefit from speaking with a psychologist?

Brief Sexual Symptom Checklist for Women

1. Are you satisfied with your sexual function?
   - Yes?
   - No?

   If no please continue:

2. How long have you been dissatisfied with your sexual function?

3. Mark which of the following problems you are having and circle the one that is most bothersome:
   1. Little to no interest in sex
   2. Decreased genital sensation (feeling)
   3. Decreased vaginal lubrication (dryness)
   4. Problem reaching orgasm
   5. Pain during sex
   6. Other________________________
Questions for Patients

- Questions for our cancer patients:

**Female**
- Vaginal lubrication – is there enough vaginal lubrication for intercourse?
- Vaginal atrophy – is vaginal penetration difficult or painful

**Male**
- Erectile dysfunction?

**Male and Female**
- Urinary frequency and urgency?
- Burning during or after urination
- Increased number of urinary tract infections
- Rectal atrophy – has it become more difficult to eliminate stool
- Dyspareunia (pain with intercourse)
- Orgasmic capacity – has it decreased
- Impact of cancer treatment on partner e.g. erectile dysfunction, vaginal atrophy

Would you like a consultation with a psychologist?

Recommendations for Urogenital, Rectal, Pelvic Floor Health & Sexual Function

- Use of vaginal lubricants and moisturizers
  - Hybrid lubricants
  - Vaginal moisturizers
  - Education and instruction on positioning during sexual intercourse or sexual activity

- Vaginal hygiene:
  - Rinse vulvovaginal tissue with warm water, pat dry
  - NO soap, fabric softener, thongs, skin tight pants, shaving pubic hair

- Instruction on how to improve vaginal, rectoanal, penile erection, and pelvic floor tone
  - Kegels if pelvic floor muscles are not high tone
  - Stretching exercises for the pelvic floor are almost always helpful
  - Use of vibrating dilator if patient does not have pain in vagina or rectum
  - Penile pumps, self or partner stimulation
  - Internal manual therapy and Biofeedback

Diet, Bowel, Bladder, and Hygiene

- Diet, massage and positioning for bowel function
  - Adequate fiber and fluid
  - Avoid/reduce full sugar soda (eliminate diet soda)
  - Eliminate artificial sweeteners
  - Abdominal massage and positioning for defecation
  - Squatty potty

- Dietary tips to reduce irritation to bladder and urethra
  - Adequate fluid**
  - Reduce or eliminate caffeine, carbonated beverages, spicy food

- Vaginal hygiene:
  - Rinse vulvovaginal tissue with lukewarm water, pat dry
  - NO soap, fabric softener, thongs, skin tight pants, shaving pubic hair

Part II
Chart Review

- Age of patient
- Comorbidities
- Response to treatment
- Type of cancer gives frame of reference for PT treatment
- Look for documentation of side effects from chemotherapy and/or radiation
- Date of treatment provides information on stage of healing
- Location of surgery: prostate, rectal, colorectal, anal, vagina, uterus, cervix, breast
- Extent of surgery -> large tumor = more surgery, more nodes, more risk of lymphatic compromise

Highlights of Chemotherapy

- Chemotherapy grouped into families
- 1 family may serve different cancer types
- Does not discriminate
- Dose related
- Patient characteristics may increase risk of side effects
- Some families more toxic

Common Side Effects, Risk Factors, Symptoms

- Cardiotoxicity
- Chemotherapy Induced Peripheral Neuropathy (CIPN)
- Cognitive impairment
- Symptoms and interventions
- Patient risk factors

Hormonal Chemotherapy Side Effects

- Aromatase inhibitors
  - Anastrozole
  - Letrozole
  - Exemestane
- Tamoxifen
- LHRH
  - Leuprolide
  - Zoladex

Chemotherapy & Patient Characteristics

Patients with BMI > 25 require more chemotherapy
- Cardiovascular toxicity
  - More side-effects -> less tolerance -> dose reduced -> less effective

Older age >50
- Pre existing cardiovascular disease
  - HTN
  - Left ventricular ejection fraction (LVEF) between 50% and 55%
  - Previous anthracycline therapy

African American (anthracycline family)

Radiation Highlights

- External beam radiation
- 3-D conformal radiation
- Intensity-modulated radiation therapy (IMRT)
- Tomotherapy
- Stereotactic radiosurgery
- Stereotactic body radiation therapy
- Brachytherapy
- Combined chemo and radiation therapy
Side Effects of Radiotherapy to the Pelvic Region

- Pelvic radiotherapy (RT) is associated with:
  - Loss of fertility
  - Vaginal atrophy, stenosis
  - Decreased elasticity and compliance of the rectum, decreased contractility of anal sphincter -> fecal incontinence and urgency
  - Urinary urgency, urinary incontinence (higher risk for cervical, and prostate)
  - Proctitis
  - Pain with vaginal intercourse
  - Decreased libido
  - Pelvic fractures
  - Lymphedema
- Most patients will experience negative effects for at least 2 years after RT.
- Effects of RT may continue for months to years after treatment.

Cardiovascular Exercise

- No specifics are given
- "An initial goal of 150 minutes of moderate-intensity exercise per week, as recommended by the American College of Sports Medicine (ACSM)."
- How many days per week??
- "Data are inadequate regarding the proportion of colorectal cancer (CRC) survivors that could be safely prescribed with the dose of exercise recommended by ACSM, American Cancer Society (ACS), or the National Comprehensive Cancer Network (NCCN) in an unsupervised setting."
- "The optimal form of exercise training for cancer patients still remains unclear... further research is needed to determine best type, timing and intensity of exercise for the different types and stages of cancer."

Exercise and Cancer

Exercise Benefits
- Aerobic Exercise:
  - Improves function ~ 1 MET
  - Promotes Self Esteem
  - Associated with improved Bowel, Bladder and Sexual Function
  - Reduces cardiovascular disease (CVD) risk
- Resistance Training:
  - Improves function
  - Increases lean muscle mass
  - Reduces osteoporosis
  - Reduces triglycerides to reduce CVD

Precautions
- Max HR prediction equations
- Resting HR and BP Training effects
- Ratings of Perceived Exertion

Systems to Consider

- Cardiovascular (CV)
- Gastrointestinal (GI)
- Lymphatic (LYM)
- Musculoskeletal (MSK)
- Neuromuscular (NM)
- Urogenital (UG)
Exercise Tests & Assessments

- Drouin et al. 2013: Validity of Heart Rate Max Equation
- \( HR_{\text{max}} = 220 - \text{age in years} \)
- \( HR_{\text{max}} = 207 - (0.7 \times \text{age in years}) \)
- \( HR_{\text{max}} = 207 - (0.86 \times \text{age in years}) \)

Exercise Tests & Assessments

- Harbac, Drouin et al. Abstract ACSM 2012
- \( HR_{\text{max}} = 213 - (0.89 \times \text{age}) + (0.34 \times HR_{\text{rest}}) - (1.11 \times \text{BMI}) \)

\( \Delta RHR \) - Exercise Vs. Control

<table>
<thead>
<tr>
<th></th>
<th>PRE</th>
<th>POST</th>
<th>( \Delta )</th>
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</thead>
<tbody>
<tr>
<td>AE RHR</td>
<td>77.5</td>
<td>85.2</td>
<td>-7.7</td>
</tr>
<tr>
<td>CG RHR</td>
<td>81.6</td>
<td>89</td>
<td>-7.4</td>
</tr>
</tbody>
</table>

\( RPE: t\text{-test analysis} \)

- \( p = <.001 \)

Results: Confidence Intervals

Exercise Recommendations

- Exercise Screen
  - PAR Q or graded exercise test (GXT)
  - Patient Education
  - GXT is a guideline - exercise may be adjusted based on responses
  - What to feel or NOT feel during exercise
- Monitor vitals during initial exercise sessions
- Adjust intensity/duration
- When to contact PT or physician
Lymphatic System

Need to know:
- Basics of the lymphatic system
- Node removal?
- Radiation?

Signs and symptoms of distressed lymphatics
- Heaviness in affected region
- Achiness
- Generalized numbness and tingling
- Swelling

Exercise for the Lymphatic System

Upper Extremity
- Diaphragmatic breathing
- Neck turns
- Shoulder rolls
- Scapular retraction
- Elbow bends
- Wrist wave
- Gentle fist “squeeze”

Lower Extremity
- Diaphragmatic breathing
- Gluteal squeezes
- Heel slides
- Quad press or short arc quad
- Ankle pumps
- Ankle circles

Musculoskeletal System

- Pelvic floor
- Abdominal and lower back
- Lower and upper extremity strength
- Be aware of HAFNTS

Pelvic Floor Rehab Exercises

- Pelvic Floor Strength
  - Contraction
  - Rest phase
  - Number of repetitions
  - Pelvic floor PT
- Pelvic Floor Stretch
  - Modified child’s pose
  - Happy baby
  - Figure 4
  - Supine frog with thighs on pillows

Core and Lower Extremity Strength

- Activate muscle pump for lymphatics
- Gluteals
- Clams
- Bridging
- Bird dog
- Sit to stand (modified squats)
- Calf raises
Lower Extremity Stretching

- Hip adductors
- Hamstrings
- Quads
- Gastrocs

Gastrointestinal System

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diarrhea</td>
<td>Diet</td>
</tr>
<tr>
<td>Constipation</td>
<td>Defecation techniques</td>
</tr>
<tr>
<td>Rectal stenosis</td>
<td>Abdominal massage</td>
</tr>
<tr>
<td></td>
<td>Dilator wand with vibrator</td>
</tr>
</tbody>
</table>

Constipation is NO Joke

Abdominal Massage

Positioning for Defecation

- Last but not
- Least

Vibrating Dilators for Women & Men

- Size 1
- Size 2 and 3
Neuromuscular

- Balance
- Loss of fine motor skills
- Gait

Questions?

Thank You

References

- Boster, Nancy A. M.D., Hafemann, Elizabeth B. S.I., Tepper, Joel E. M.D. et al.  Risk of Pelvic Fractures in Older Women Following Pelvic Radiation.  JAMA, November 25, 2003 - Vol 290, No. 20
Current Medical & Surgical Treatment for Men

**Treatment**

- **Medical and surgical treatment**
  - Systemic administration of opioid antagonists (e.g., naltrexone) and vasodilators (e.g., yohimbine) have been used to treat erectile disorder.
  - In erectile disorder, *sildenafil citrate* (Viagra) and related agents work by blocking an enzyme (phosphodiesterase-5) that destroys cyclic guanosine monophosphate (cGMP), a vasodilator secreted in the penis with sexual stimulation.
  - Intracorporeal injection of vasodilators (e.g., papaverine, phentolamine) or implantation of prosthetic devices are also used to treat erectile dysfunction.
  - *Apomorphine hydrochloride* (Uprima) increases sexual interest and erectile function by increasing dopamine availability in the brain.