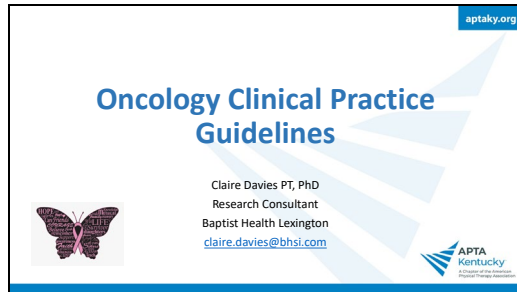


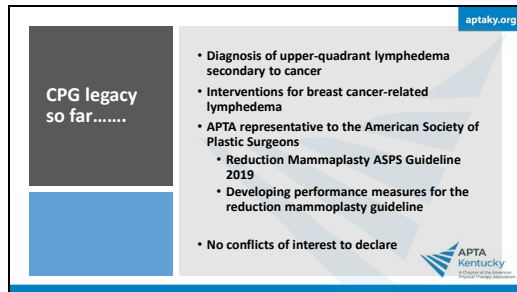
Slide 1



Slide 2



Slide 3



Slide 10

Starting a CPG

- Identify an important clinical question
 - What is current best practice for the **diagnosis, assessment, and management** of Upper Quadrant Lymphedema secondary to Cancer?
- In July 2012 the Oncology Section sent a small group to a CPG development workshop to start the process.
 - Identified the question and wrote a small grant to APTA

APTAKENTUCKY.ORG

APTAKentucky
A Division of the American
Physical Therapy Association

Slide 11

Getting started

Identify if current CPGs exist that answer this question sufficiently

- 4 Guidelines found on diagnosis
 - Nursing guideline
 - Pharmacologic and Surgical Management Guidelines
 - Agency for Healthcare Quality and Research (AHRQ) 2010 Technology Assessment
 - Literature searched 1990-Jan 2010

Provided little guidance with few diagnostic accuracy studies

Limitations in databases searched

None fit PT Practice

APTAKENTUCKY.ORG

APTAKentucky
A Division of the American
Physical Therapy Association

Slide 12

Process

- With assistance of Academic Reference Librarians (SLU and USC) developed search strategy and executed search
 - Difficulty not excluding relevant articles so had an expansive search
 - Lymphedema, Elephantiasis, and truncated text words *lymphedema**, *lymphoedema**, *elephantiasis*
 - Excluded: *filariasis, parasites, congenital, hereditary*, as well as *editorial, letter, and comment*

APTAKENTUCKY.ORG


APTAKentucky
A Division of the American
Physical Therapy Association

Slide 13

aptaky.org

Review of Literature

- Literature Searches began in January 2000
 - Pubmed, CINAHL, Cochrane, AHRQ, National Guideline Clearinghouse, Scopus, SPORTdiscus with Full Text, PEDro, Physiotherapy Evidence Database, OTseeker Occupational Therapy Systematic Evaluation of Evidence
- Diagnostic CPG search through July 2015
 - Total Articles – 9,247
 - Included - 91
- Intervention CPG search through March 2019
 - Total Articles – 13,033
 - Included – 163
- Exclusion Criteria: Non-cancer, Lower Extremity, Animal Models, Surgical/Pharmacological Approaches, Case Studies




Slide 14

aptaky.org

Quality Rating Tools


- All articles were rated for risk of bias using established quality rating tools
- Assessment:
 - Reliability: QAREL (Lucas 2010, 2013)
 - Validity: QUADAS (Whiting 2003, 2011)
 - Diagnostic Accuracy: QUADAS (Whiting 2003, 2011)
- Interventions: Critical Appraisal Tool –Experimental Intervention (APTA, 2018)
 - Developed by APTA , 2018 – to review quality of intervention trials
 - High quality: Appropriate patient population; Randomized, Controlled Trial; Tester Blinded; Sufficient follow-up; Valid and Reliable Outcome Measure; Adequate Sample Size; Appropriate Statistical Analysis



Slide 15

Preliminary Recommendation Statements Constructed

- Based on the quality of evidence (APTA CPG Manual)
 - **Grade A:** High quality studies (Level I) with moderate to substantial benefit/harm – “Must/Should” or “Must not/Should not”
 - **Grade B:** High Level studies (Level I) with slight to moderate benefit/harm OR Moderate level evidence (Level II) for moderate level benefit/harm -“Should” or “Should not”
 - **Grade C:** Moderate level evidence (Level II) for slight level benefit or harm OR Weak level evidence (level III) for substantial benefit/harm – “May” or “May not”
 - **Grade D:** Best Practice – based on current clinical norms or expert opinion



Slide 16

aptaky.org

All Statements were preliminary drafts and were revised prior to finalization and publication

- Further Review and Revisions
 - From public presentation to APTA members at CSM
 - Reviewed by external PTs, OTs, and MDs
 - Reviewed by other experts and professional groups
 - Public comment period on Academy website

APTA Kentucky
A Division of the American Physical Therapy Association

Slide 17

aptaky.org

Final CPG Published in PTJ
Diagnosis of Upper Quadrant Lymphedema Secondary to Cancer;
Clinical Practice Guideline from the Academy of Oncologic Physical Therapy of the APTA

APTA Kentucky
A Division of the American Physical Therapy Association

Slide 18

aptaky.org

Summary of Diagnosis of Upper Quadrant Lymphedema Secondary to Cancer: #1
Clinical Practice Guideline From the Oncology Section of the American Physical Therapy Association

2017

- Levenhagen K, Davies C, Perdomo M, Ryans K, Gilchrist L. Diagnosis of Upper Quadrant Lymphedema Secondary to Cancer: Clinical Practice Guideline From the Oncology Section of the American Physical Therapy Association. *Phys Ther*. 2017;97(7):729-745. doi:10.1093/ptj/pxx050
- Davies C, Levenhagen K, Ryans K, Perdomo M, Gilchrist L. *Rehabilitation Oncology*. 2020;38(3):103-109. DOI: 10.1097/01.REO.0000000000000223, Issn Print: 2168-8808
- Perdomo M, Ryans K, Levenhagen K, Davies C, Gilchrist L. Clinical Implementation of the Clinical Practice Guidelines for Diagnosing Upper-Quadrant Lymphedema Secondary to Cancer. *Rehabilitation Oncology* 2018;36(3): E11-E18.

APTA Kentucky
A Division of the American Physical Therapy Association

Slide 22


aptaky.org

Water Displacement

- Due to its excellent reliability, water displacement has been considered the reference standard in much of the validity and diagnostic accuracy research (Bronson 2012, Taylor 2006, Lee 2010, Sander 2002, Karges 2003, Gjorup 2010, McKinnon 2007)
- Validity and diagnostic accuracy revealed variability of quality ratings necessitating the need for more rigorous evidence

Recommendations: At this time, strong evidence exists to support the reliability, strong/moderate evidence for validity and moderate evidence for diagnostic accuracy and thus it is recommended for detection of upper extremity lymphedema.

- Clinically, time constraints, set up, and cross-contamination limits its utility


APTA
Kentucky
A Division of the American
Physical Therapy Association


Slide 23

aptaky.org

Perometry Recommendation

- Strong evidence to support the reliability
- Moderate quality evidence to support validity
- No evidence to support diagnostic accuracy

Recommendation: At this time, perometry has been used primarily in research is not currently recommended due to lack of diagnostic accuracy studies. The expense, bulkiness, and availability in the US also limits its clinical usefulness.


APTA
Kentucky
A Division of the American
Physical Therapy Association


Slide 24

aptaky.org

Ultrasound Recommendation

- Only weak to moderate level evidence is available for reliability
- Validity yielded mixed results in moderate quality studies
- 1 high quality study on the diagnostic accuracy; sensitivity was only acceptable at a few sites in the arm and specificity was acceptable

Recommendation: At the time of the CPG, US may be used to identify tissue changes in SUQL but requires cautious interpretation as well as other measures for diagnostic purposes



APTA
Kentucky
A Division of the American
Physical Therapy Association

Slide 25

aptaky.org

Emerging Diagnostic

- **Tissue Dielectric Constant Recommendation:** While TDC is a promising new measure for SUQL that may be incorporated into clinical practice, other diagnostic measures should also be used
- **Lymphoscintigraphy Recommendation:** At the time of the CPG, lymphoscintigraphy was not recommended for diagnosing SUQL but is emerging as an important tool prior to surgical intervention

 APTA Kentucky
A Division of the American Physical Therapy Association

Slide 26


aptaky.org

Clinical Practice Guideline: #2 Non-surgical, Non-pharmacological Intervention Guidelines

2020

Davies et al. Interventions for Breast Cancer-Related Lymphedema: Clinical Practice Guidelines from the Academy of Oncologic Physical Therapy of the APTA. *Physical Therapy*. 2020;100(7):1163-1179.

Davies et al. An Executive Summary of the APTA Academy for Oncologic Physical Therapy Clinical Practice Guideline: Interventions for Breast Cancer-Related Lymphedema. *Rehabilitation Oncology*. 2020; 38:103-109.

 APTA Kentucky
A Division of the American Physical Therapy Association

Slide 27

aptaky.org


Construction of Intervention CPG – SR

Literature searched from Jan 2000 – March 2019

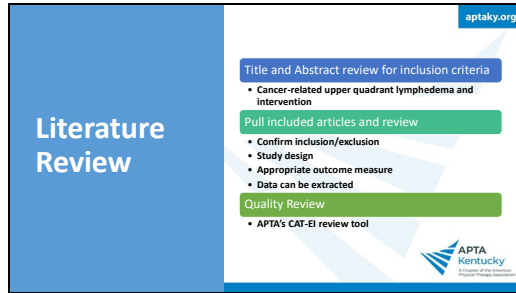
- PubMed
- CINAHL Plus with Full Text
- Cochrane
- AHRQ
- National Guideline Clearinghouse
- Scopus
- SPORTDiscus with Full Text
- PEDro Physiotherapy Evidence Database
- OTRseeker Occupational Therapy Systematic Evaluation of Evidence

Terms: *Lymphedema, Elephantiasis*, and truncated text words *lymphedema*, lymphoedema*, elephantiasis*

Excluded: *Filariasis, parasites, congenital, hereditary*, as well as *editorial, letter, posters, dissertations, and comments*

 APTA Kentucky
A Division of the American Physical Therapy Association

Slide 28



Literature Review

Title and Abstract review for inclusion criteria

- Cancer-related upper quadrant lymphedema and intervention

Pull included articles and review

- Confirm inclusion/exclusion
- Study design
- Appropriate outcome measure
- Data can be extracted

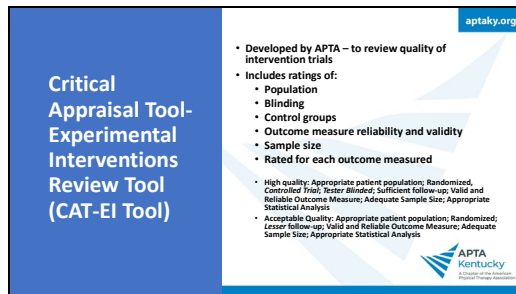
Quality Review

- APTA's CAT-EI review tool

APTAKY.ORG

APTAKentucky
A Division of the Kentucky Physical Therapy Association

Slide 29



**Critical Appraisal Tool-
Experimental Interventions
Review Tool
(CAT-EI Tool)**

• Developed by APTA – to review quality of intervention trials

• Includes ratings of:

- Population
- Blinding
- Control groups
- Outcome measure reliability and validity
- Sample size
- Rated for each outcome measured

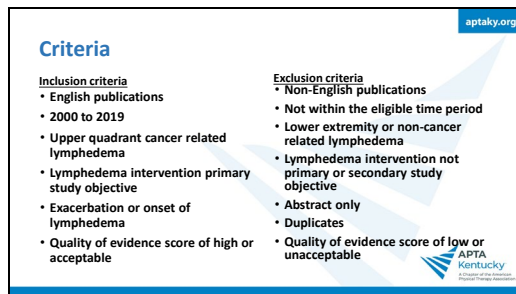
• High quality: Appropriate patient population; Randomized; Controlled; Blind; Double blinded; Sufficient follow up; Valid and Reliable Outcome Measure; Adequate Sample Size; Appropriate Statistical Analysis

• Acceptable Quality: Appropriate patient population; Randomized; Lesser follow up; Valid and Reliable Outcome Measure; Adequate Sample Size; Appropriate Statistical Analysis

APTAKY.ORG

APTAKentucky
A Division of the Kentucky Physical Therapy Association

Slide 30



Criteria

Inclusion criteria

- English publications
- 2000 to 2019
- Upper quadrant cancer related lymphedema
- Lymphedema intervention primary study objective
- Exacerbation or onset of lymphedema
- Quality of evidence score of high or acceptable

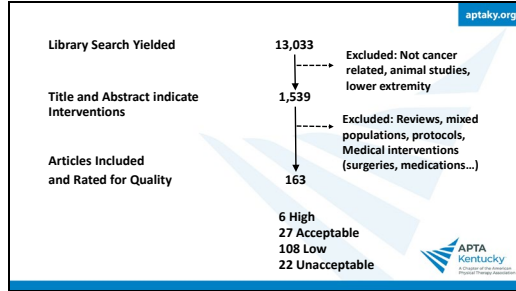
Exclusion criteria

- Non-English publications
- Not within the eligible time period
- Lower extremity or non-cancer related lymphedema
- Lymphedema intervention not primary or secondary study objective
- Abstract only
- Duplicates
- Quality of evidence score of low or unacceptable

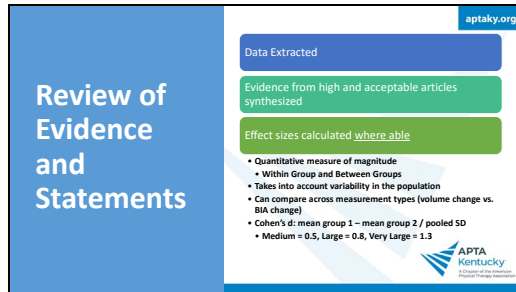
APTAKY.ORG

APTAKentucky
A Division of the Kentucky Physical Therapy Association

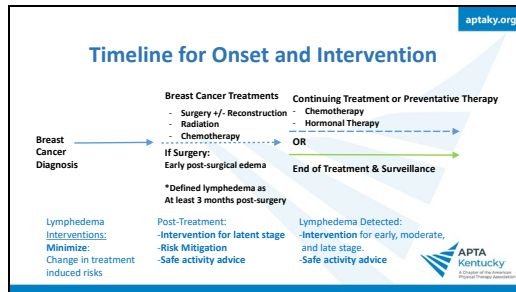
Slide 31



Slide 32



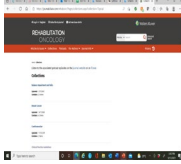
Slide 33



Slide 34

aptaky.org

Considering the Whole Person: Impairments, Activity & Participation Restrictions in Survivors with Breast Cancer




From the Rehabilitation Oncology Journal website
There is a heading collections – follow that link and you will find all the Breast cancer recommended outcome measures I referred to.

APTA Kentucky
A Division of the American Physical Therapy Association

Slide 35

aptaky.org

Non-surgical, Non-pharmacological Intervention Guidelines for Breast Cancer-Related Lymphedema



APTA Kentucky
A Division of the American Physical Therapy Association

Slide 36

aptaky.org

Prospective Surveillance Model

For High-risk groups - may identify subclinical lymphedema early to improve outcome (C)

Surveillance:
Pre-operative assessment,
Every three months for the first-year post-op
Biannually for up to 5 years.

Use volume measures or BIS for monitoring (C)

If early subclinical lymphedema persists or progresses after initial conservative intervention refer for more intensive intervention – (CDT) (C)


APTA Kentucky
A Division of the American Physical Therapy Association

Slide 37

aptaky.org

Education (BP)

- **All Patients and Survivors with a Cancer Diagnosis**
- Across the trajectory
 - Pre-operative to lymphedema diagnosis
 - Establish a patient centered plan of care
 - Modified based on clinical presentation and psychosocial factors
 - Education will change based on risk and or established lymphedema present.




APTA Kentucky
A Division of the American Physical Therapy Association

Slide 38

aptaky.org

Therapeutic Exercise

- Safe and essential to individuals throughout the cancer trajectory
- Evidence refutes exercise as a risk factor for development or exacerbation of lymphedema
- Collaboration with clinician and healthcare team
- Consider
 - Other comorbidities
 - Body system impairments




APTA Kentucky
A Division of the American Physical Therapy Association


Slide 39

aptaky.org

What do we mean by safe?



- **Did not result** in lymphedema in patient at risk for SUQL
 - Diagnosis of SUQL > 3 months post surgery
- **Did not cause** short or long-term exacerbation in patients with SUQL
- Determined during the study's follow up time period
 - 24 hours to 2 years




APTA Kentucky
A Division of the American Physical Therapy Association

Slide 49

aptaky.org

Reference for the flow diagrams for implementing the intervention CPG.

- Ryans, K., Perdomo, M., Davies, C.C. *et al.* Rehabilitation interventions for the management of breast cancer–related lymphedema: developing a patient-centered, evidence-based plan of care throughout survivorship. *J Cancer Surviv* (2021). <https://doi.org/10.1007/s11764-021-00991-2>




APTA Kentucky
A Division of the American Physical Therapy Association

Slide 50

aptaky.org

Remember *Reminder!!*

- Clinical experience is crucial in the process
- Observe the individual in front of you
- Find out their goals
- Be guided by the CPG




APTA Kentucky
A Division of the American Physical Therapy Association

Slide 51

aptaky.org

CPG Limitations

- Many of the intervention studies were pilot and therefore lacked sufficient sample sizes, blinding, and follow up
- All of our higher/acceptable quality studies were performed on those with BCRL.
- Studies may have been published outside of review timeframe
 - On-going effort to include additional articles published since March 2019
- Non-published studies



APTA Kentucky
A Division of the American Physical Therapy Association

Slide 52

Future Directions

- Limitations of CPGs**
 - Based on a systematic review of the literature with input from clinical experts when evidence does not exist
 - Lagging in terms of cutting-edge research and novel ideas
- CPGs need to be updated**
 - Every 5 years or
 - When significant changes in the literature base occurs
- Multidisciplinary**
 - Initial CPGs were developed by PTs with multidisciplinary reviews

APTAKENTUCKY
A Division of the American Physical Therapy Association

Slide 53

Important Research Questions

- Stages of lymphedema**
 - How does this impact the interventions needed?
 - Trials need to better clarify the intervention population and do sub-population analysis
- Larger scale intervention trials are needed!**
 - Need to use validated measures for inclusion of subjects and outcome measures, as well as longer follow-up periods
 - Need to have trials with true control groups (blinded, education...) to demonstrate the effect of interventions
 - Need to design trials to tease out the contribution of each treatment component
 - Please include adequate descriptions of interventions!
- Interventions we may feel are best practice needs higher level research evidence**

APTAKENTUCKY
A Division of the American Physical Therapy Association

Slide 54

Hope for the Future


- Develop Partnerships:**
 - APTA
 - ACRM
 - AOTA
 - Other professional organizations
- Commitment to unbiased reviews of the evidence**
- Resources needed to conduct more timely updating of CPGs and other evidence-based documents**
- Increased research that clearly defines the populations studies and the stages of lymphedema**
 - Pressure from CPGs to create future research

APTAKENTUCKY
A Division of the American Physical Therapy Association

aptakv.org

References

- Perdomo M, Ryans K, Levenhagen K, Davies C, Gilchrist L. Clinical Implementation of the Clinical Practice Guidelines for Diagnosing Upper-Quadrant Lymphedema Secondary to Cancer. *Rehabilitation Oncology* 2018;36(3): E11-E18.
- Perdomo M, Sebeliski C, Davies C. Oncology Task Force on Breast Cancer Outcomes: Shoulder and Glenohumeral Outcome Measures. *Rehabilitation Oncology* 2013; 30(4).
- Ryans et al. Rehabilitation Interventions for the Management of Breast Cancer-Related Lymphedema: Developing a Patient-Centered, Evidence-Based Plan of Care Throughout Survivorship. *Journal of Cancer survivorship*. Accepted January 2021.
- Whiting P, Rutjes AW, Reitsma JB, et al. The development of QUADAS: a tool for the quality assessment of studies of diagnostic accuracy included in systematic reviews. *BMC Med Res Methodol*. 2003;3:25.
- Whiting PE, Rutjes AW, Westwood ME, et al. QUADAS-2: a revised tool for the quality assessment of diagnostic accuracy studies. *Ann Intern Med*. 2011;155:529-536.



APTA
Kentucky
Physical Therapy Association
