Department of Surgery
Grand Rounds
June 28, 2017

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Associate Professor
Thoracic Surgery
Why do I want to tell you this story?
Outline

• What exists now?
• Why did the project start?
• How was the project executed?
• What did we come up with for esophageal cancer?
• What is the future of this project?
Critical elements of an operative procedure for cancer resection

• What exists now?

• Is there a resource that defines this? Are there guidelines?
Surgical Atlases of Cancer Surgery
I found 2 on Amazon
NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®)

Non-Small Cell Lung Cancer

Version 6.2017 — May 12, 2017

NCCN.org

NCCN Guidelines for Patients® available at www.nccn.org/patients

Continue
**NCCN Guidelines Version 6.2017**

**Non-Small Cell Lung Cancer**

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**CLINICAL ASSESSMENT**

- Stage IA (peripheral T1a/b, N0)
  - PFTs (if not previously done)
  - Bronchoscopy (intraoperative preferred)
  - Consider pathologic mediastinal lymph node evaluation
  - FDG PET/CT scan if not previously done

- Stage IB (peripheral T2a, N0)
  - PFTs (if not previously done)
  - Bronchoscopy
  - Pathologic mediastinal lymph node evaluation
  - FDG PET/CT scan if not previously done
  - Brain MRI with contrast (Stage IIa, IIIa)

- Stage IIA (T3, N0)*
  - Definitive chemoradiation

- Stage IIB (T3, N1)*
  - Definitive chemoradiation

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**PRETREATMENT EVALUATION**

- Negative mediastinal nodes
- Positive mediastinal nodes

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**INITIAL TREATMENT**

- Surgical exploration and resection + mediastinal lymph node dissection or systematic lymph node sampling
  - Operable
  - Medically inoperable

- Definitive RT including stereotactic ablative radiotherapy (SABR)†

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- See Adjuvant Treatment (NSCL-3)

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- Stage I (central T1a/b–T2a, N0)
  - Definitive RT including SABR
  - Operable
  - Medically inoperable

- See Stage IIIA (NSCL-7) or Stage IIB (NSCL-11)

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- Stage II (T1a–2b, N1; T2b, N0)*
  - Definitive RT including SABR
  - Operable
  - Medically inoperable

- Consider adjuvant chemotherapy (category 2B) for high-risk stages IB–IIIB

- See Stage IIIA (NSCL-7) or Stage IIB (NSCL-11)

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*See Principles of Radiation Therapy (NSCL-5).
†See Chemotherapy Regimens Used with Radiation Therapy (NSCL-2).
‡See Chemotherapy Regimens Used with Neoadjuvant and Adjuvant Therapy (NSCL-6).
§Experience of high-risk factors may include poorly differentiated tumors (including lung neuroendocrine tumors [excluding well-differentiated neuroendocrine tumors]), vascular invasion, wedge resection, tumors >4 cm, visceral pleural involvement, and unknown lymph node status (Nx). These factors independently may not be an indication and may be considered when determining treatment with adjuvant chemotherapy.

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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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NSCL-2
Commission on Cancer in Today’s Health Care Environment

The multidisciplinary Commission on Cancer:

- Establishes standards to ensure high-quality, multidisciplinary and comprehensive cancer care.
- Conducts surveys at cancer programs to assess compliance with those standards.
- Collects standardized high-quality data from CoC-accredited organizations.
- Uses data to measure cancer care quality and to monitor treatment patterns and outcomes.
- Requires cancer prevention and screening at programs.
- Monitors clinical surveillance activities.
- Develops effective educational programs to achieve its goals.
<table>
<thead>
<tr>
<th>Non-Small Cell Lung</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>10RLN</td>
<td>S</td>
<td>Not Applicable</td>
<td>Fall 2014</td>
</tr>
<tr>
<td></td>
<td></td>
<td>At least 10 regional lymph nodes are removed and pathologically examined for AJCC stage IA, IB, IIA, and IIB resected NSCLC</td>
<td></td>
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<tr>
<td>LCT</td>
<td>QI</td>
<td>Standard 4.5 85%</td>
<td>Fall 2014</td>
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<tr>
<td></td>
<td></td>
<td>Systemic chemotherapy is administered within 4 months to day preoperatively or day of surgery to 6 months postoperatively, or it is recommended for surgically resected cases with pathologic, lymph node-positive (pN1) and (pN2) NSCLC.</td>
<td></td>
</tr>
<tr>
<td>LNoSurg</td>
<td>QI</td>
<td>Standard 4.5 85%</td>
<td>Spring 2015</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Surgery is not the first course of treatment for cN2, M0 lung cases</td>
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</table>

S = surveillance measure; QI = Quality Improvement; A = Accountability (could be used for public reporting)
Efforts underway to establish surgical quality measures – but still doesn’t give us a “how to”
So, nothing that quite hits the nail on the head.
In the meantime...
Things happening at the NCI

• Merging of cooperative oncology groups
  • American College of Surgeons Oncology Group – formed in the 1990’s
  • Joined with NCCTG and CALGB to form ALLIANCE in 2011

• ACS directed Committees were formed within the Alliance:
  • Cancer Care Standards Development Committee
  • Cancer Care Delivery Research Committee
  • Dissemination and Implementation Committee
  • Education Committee
Cancer Care Standards Development Committee

• This was a new committee, finding its way
• The concept of this book developed
• The committee wanted something that describes the “minimum standard” of a cancer operation, focusing on the steps that occur from “skin to skin”
• Goal to be EVIDENCE BASED
• Not the opinion of a single surgeon
Joint Project of ACS and Alliance: Cancer Care Standards Committee
First Edition

- Breast – Sarah Blair
- Lung – Nirmal Veeramachaneni
- Pancreas – Matthew Katz and Mitchell Posner
- Colon – George Chang and Amy Halverson
Goals of the Project – from the Lung Cancer Introduction

**Purpose**
The purpose of this section is to describe a minimal standard for the actions that should be taken in the surgical care of lung cancer patients, with the ultimate goal of improving the quality of care these patients receive. In this way, the aim of the following chapters is to “raise the floor” rather than define the absolute ceiling of what can be achieved; further improvement is always possible. This standard should serve

“People never improve unless they look to some standard or example higher or better than themselves.” Tyron Edwards, American theologian 1809-1894
Potential Uses

• Original goal was to serve as a reference point for clinical trials
  • Minimize variability across study sites, improve adherence to minimum standards both on and off trials
  • Avoid redefining surgical criteria for each new trial

• Establish what is agreed upon – CRITICAL ELEMENTS
• and where there are areas of controversy, topics that need further study or clinical trials – KEY QUESTIONS
Potential Uses

• The manual is not a surgical atlas; rather, the emphasis is on oncologic fundamentals and the critical elements in the conduct of an operation and intraoperative decision making

• Evidence based – strong emphasis on this

• Working with COC on Quality Measures
Content – example from Lung Cancer Section

• **Critical Elements** of operative management of each disease site:
  • Endobronchial ultrasound guided node biopsies (EBUS)
  • Mediastinoscopy
  • Minimally invasive and open approaches to mediastinal lymphadenectomy
  • Principles of Lung Resection
  • Segmentectomy
  • Lobectomy
  • Pneumonectomy

• **Key Questions** – areas of controversy:
  • When should negative EBUS findings be confirmed by a more invasive procedure?
  • What is the difference between mediastinal node DISSECTION and mediastinal node SAMPLING, and what circumstances dictate the use of one or the other during an anatomic pulmonary resection for NSCLC?
  • In patients with stage I NSCLC, what factors determine if segmentectomy should be abandoned for lobectomy?
Second Edition - editors

Matthew Katz, MD
Section Chief of Pancreatic Surgery,
MD Anderson

Nirmal Veeramachaneni, MD
Chief of Thoracic Surgery
University of Kansas
Topics for 2nd Edition

• Thyroid – Elizabeth Grubbs and Tracy Wang
• Melanoma – John Kane
• Esophagus – Linda Martin and Rishi Reddy
• Stomach – Ryan Fields and Shishir Maithel
• Rectum – George Chang and Amy Halverson
Changes in 2nd edition

• Continued refinement of the scope of the project – harder than you think!
• More focus on how we can facilitate Commission on Cancer Quality Measures
  • Make our own rules instead of having them forced upon us!
• Goal to include multimedia, “21st century”
  • Appointed video and web content editors for each section
• Stronger focus on methodology, systematic review
• International collaboration
Operative Standards for Esophageal Cancer Surgery

The Process
Forming Our Team - Esophagus

• Thoracic surgeons
• Surg onc/GI surgeons, including gastric cancer experts
• Esophageal endoscopists, both surgical and GI
• Pathologists who specialize in esophagus
• “Experienced” surgeons and young attendings, fellows
• International representation
• Representation from several specialty organizations – ACS, STS, AATS, COC, community and academic practice, SAGES, SSO and so on
Esophageal topics – 10 sections

• Critical elements:
  • Resection of primary tumor to negative margins
  • Lymph node dissection
  • Gastric conduit preparation
  • Anastomotic technique
  • Alternate conduits

• Key Questions
  • What constitutes optimal management of T1N0 esophageal adenocarcinoma?
  • How many lymph nodes need to be removed to make it an “adequate” operation, and does the number change after induction therapy?
  • Should multidisciplinary treatment differ for esophageal adenocarcinoma vs. squamous cell cancer?
  • What constitutes optimal management of T2N0 esophageal cancer?
  • For GE junction cancers, does an esophageal or gastric surgical approach offer better perioperative and oncologic outcomes?
Our team leaders - Esophagus

• Editors: Linda Martin – UVA, Rishi Reddy - Michigan
• Methodologists: Varun Puri – Wash U and Katie Nason-Pittsburgh
• Art/illustrations editor: Elizabeth Dexter – Roswell Park
• Video/web content: Shanda Blackmon – Mayo clinic

• Chapter leads:
  • Marco Patti - UNC
  • Lana Schumacher – Allegheny
  • Kirin Lagisetty - Michigan
  • Richard van Hillegersberg - Utrecht
  • Shanda Blackmon – Mayo
  • Melanie Edwards – SLU
  • Bruce Greenwald – U Maryland
  • Inderpal Sarkaria – Pittsburgh
  • Lorenzo Ferri – McGill
  • Daniela Molena – MSKCC
  • Wayne Hofstetter - MDACC
Other Contributors

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- Rose Ganim
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- Michael Friscia
- Lucas Goense
- Jelle P. Ruurda
- Sheraz R. Markar
- Wolfgang Schroeder
- Miguel A. Cuesta
- Jonathon Cools-Latrigue
- Biniam Kidane
- Benny Weksler
- Robert Korst
- K Robert Shen
- Erin Gillaspie
- Mark Ferguson
- Brian Louie
- Jonathan Yeung
- Mark Orringer
- Manjit Bains
- Francisco Schlottmann
- Arianna Barbeta
- Kenneth Wang
- Nicholas Shaneen
- Prasad Iyer
- Swathi Eluri
- Fariha Ramay
- Kavel Visrodia
- Atuhani Burnett
- Ryan Macke
- Blair Jobe
- Mark Crye
- Manjit Bains
- Gail Darling
- Steven Demeester
- Donald Low
- Alykhan Nagji
- Stephen Swisher
• Methodologists helped each team come up with defined questions
• Guided us to do abbreviated systematic reviews on all 10 topics
• Consensus Building
Welcome to the GRADE working group

From evidence to recommendations – transparent and sensible

What is GRADE?

The GRADE working group

The Grading of Recommendations Assessment, Development and Evaluation (short GRADE) working group began in the year 2000 as an informal collaboration of people with an interest in addressing the shortcomings of grading systems in health care. The working group has developed a common, sensible and transparent approach to grading quality (or certainty) of evidence and strength of recommendations. Many international organizations have provided input into the development of the GRADE approach which is now considered the standard in guideline development.

Why rate the certainty in the evidence and strength of recommendations?

Criteria for applying or using GRADE
Welcome to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) website!

PRISMA is an evidence-based minimum set of items for reporting in systematic reviews and meta-analyses. PRISMA focuses on the reporting of reviews evaluating randomized trials, but can also be used as a basis for reporting systematic reviews of other types of research, particularly evaluations of interventions.

Who should use PRISMA?

- Authors: PRISMA aims to help authors improve the reporting of systematic reviews and meta-analyses.
- Journal Peer reviewers and editors: PRISMA may also be useful for critical appraisal of published systematic reviews, although it is not a quality assessment instrument to gauge the quality of a systematic review.

http://www.prisma-statement.org/
Operative Standards for Esophageal Cancer Surgery

The Product
Critical Element #1 – Resection of the Primary Tumor to Negative Margins
Recommendation: To achieve an optimal oncologic outcome, the proximal, distal, and circumferential esophageal margins should be free of cancer both macroscopically and microscopically. Although most surgeons attempt to divide the esophagus **5-8 cm proximal and 5 cm** distal to the gross tumor to maximize the likelihood of a microscopically negative longitudinal margin, a firm recommendation in this regard cannot be made based on existing data. To ensure a microscopically negative proximal margin, intraoperative pathologic evaluation of the margin should be considered unless resection of additional proximal esophagus would be impossible. Intraoperative assessment of the gastric margin should also be considered when the microscopic status of the margin is of concern. Skeletonization of the esophagus should be avoided to maximize the likelihood of a microscopically negative circumferential margin as the status of this margin cannot be effectively assessed intraoperatively. In all cases, the goal of negative margins should be balanced with the ability to complete the operation safely and to reestablish gastrointestinal continuity successfully.

- **Type of Data:** Retrospective data.
- **Grade of Recommendation:** Strong recommendation, low-quality evidence.
Critical Element #2 – Lymph Node Dissection
Critical Element #2 – Lymph Node Dissection

• **Recommendation:** Radical dissection of all the lymphatic tissue in the peri-esophagogastric, mediastinal, and celiac axis distributions should be performed regardless of current stage, use of induction therapy, or surgical approach.

• **Type of Data:** One randomized controlled study, multiple retrospective cohort studies

• **Grade of Recommendation:** Strong recommendation, moderate-quality evidence
Regional lymph node stations for staging esophageal cancer

(A-C) Lymph node maps for esophageal cancer. Regional lymph node stations for staging esophageal cancer from left (A), right (B), and anterior (C).

1R: Right lower cervical paratracheal nodes, between the supravclavicular paratracheal space and apex of the lung.
1L: Left lower cervical paratracheal nodes, between the supravclavicular paratracheal space and apex of the lung.
2R: Right upper paratracheal nodes, between the intersection of the caudal margin of the brachiocephalic artery with the trachea and the apex of the lung. 2L: Left upper paratracheal nodes, between the top of the aortic arch and the apex of the lung.
4R: Right lower paratracheal nodes, between the intersection of the caudal margin of the brachiocephalic artery with the trachea and cephalic border of the aygos vein. 4L: Left lower paratracheal nodes, between the top of the aortic arch and the carina. 71: Subcarinal nodes, caudal to the carina of the trachea. 8U: Upper thoracic paraesophageal lymph nodes, from the apex of the lung to the tracheal bifurcation. 8M: Middle thoracic paraesophageal lymph nodes, from the tracheal bifurcation to the caudal margin of the inferior pulmonary vein. 8L: Lower thoracic paraesophageal lymph nodes, from the caudal margin of the inferior pulmonary vein to the EGJ. 9R: Pulmonary ligament nodes, within the right inferior pulmonary ligament. 9L: Pulmonary ligament nodes, within the left inferior pulmonary ligament. 13: Diaphragmatic nodes, lying on the dome of the diaphragm and adjacent or to behind its crura. 16: Paracardial nodes, immediately adjacent to the gastroesophageal junction. 17: Left gastric nodes, along the course of the left gastric artery. 18: Common hepatic nodes, immediately on the proximal common hepatic artery. 19: Splenic nodes, immediately on the proximal common hepatic artery. 20: Celiac nodes, at the base of the celiac artery.

EGJ: esophagogastric junction.

Used with permission of the American Joint Committee on Cancer (AJCC), Chicago, Illinois. The original and primary source for this information is the AJCC Cancer Staging Manual, Eighth Edition (2017) published by Springer Science+Business Media, LLC.
Critical Element #3 – Gastrointestinal Reconstruction

Gastric conduit preparation
Creating the conduit, stapler parallel to greater curve
Conduit completed in the Abdomen
Conduit in chest, after anastomosis, properly oriented
Critical Element #3 – Gastrointestinal Reconstruction

• **Gastric conduit preparation**

  • *Recommendation:* Existing evidence does not support gastrointestinal reconstruction using any specific width of gastric conduit. Irrespective of the specific technique chosen, the submucosal collateral blood supply to the gastric conduit should be preserved to minimize the risk for anastomotic leak.

• *Type of Data:* Retrospective studies.

• *Grade of Recommendation:* Weak recommendation; low-quality evidence.
Critical Element #3 – Gastrointestinal Reconstruction

Performance of a gastric emptying procedure
What’s the Issue?  What are the options?

- Vagotomy is an obligatory part of the resection
- We create pyloric stenosis, delayed gastric emptying
- Why is that bad?

- Pyloroplasty
- Pyloromyotomy
- Botox
- Finger fracture
Critical Element #3 – Gastrointestinal Reconstruction

• **Performance of a gastric emptying procedure**
  
  • **Recommendation:** A gastric emptying procedure should be performed routinely at esophagectomy. Existing evidence does not support the exclusive use of any single procedure.
  
  • **Type of Data:** Retrospective.
  
  • **Strength of Recommendation:** Weak recommendation, low quality of evidence.
Critical Element #3 – Gastrointestinal Reconstruction

Alternate Conduits
Alternate Conduits
Cervical incision

Divided end of proximal esophagus

Head of patient

Abdomen

Reach of Jejunal Vascular Pedicle

vs

Length of Bowel

(1:3)
Critical Element #3 – Gastrointestinal Reconstruction

• *Alternate Conduits*

  • **Recommendation:** A gastric conduit should generally be used for gastrointestinal reconstruction. Although alternatives such as the colon and small bowel can be used safely and effectively in selected cases, *assistance from surgeons with expertise* in microvascular surgery may be necessary to perform a vascular anastomosis in the neck to supercharge a colon or a jejunal interposition graft.

  • **Type of Data:** retrospective data, technical manuscripts

  • **Strength of Recommendation:** weak recommendation, low quality of evidence
Critical Element #3 – Gastrointestinal Reconstruction

Anastomosis
Critical Element #3 – Gastrointestinal Reconstruction

- **LOCATION: Cervical vs. Intrathoracic Anastomosis**

- **Recommendation**: Cervical and intrathoracic anastomoses appear to be equally safe with regard to peri-operative mortality, pulmonary complications, anastomotic stricture, and quality of life. In general, the location of the anastomosis should be dictated by the location of the tumor. For distal esophageal or gastroesophageal junction tumors, existing evidence does not support the assertion that construction of a cervical anastomosis reduces recurrence or improves survival over an intrathoracic anastomosis, as long as microscopically negative margins are achieved.

- **Type of Data**: Randomized control trials, and meta-analysis

- **Strength of Recommendation**: Strong recommendation; moderate quality of evidence
Critical Element #3 – Gastrointestinal Reconstruction

- **TECHNIQUE: Hand-sewn vs. Stapled Anastomosis**

- **Recommendation:** Based on existing evidence, construction of the anastomosis using a hand-sewn or stapled technique are both acceptable. Rates of anastomotic leak, early mortality, and postoperative complications associated with hand-sewn anastomoses are not different than those associated with stapled anastomoses. However, stapled anastomoses may be associated with an increased rate of anastomotic stricture when compared with hand-sewn anastomoses.

- **Type of Data:** Randomized control trials.

- **Strength of Recommendation:** Strong recommendation; moderate-quality evidence.
Key Questions

Areas of controversy
Key Question #1 - What constitutes optimal management of T1N0 esophageal adenocarcinoma?
Early Stage Esophageal Cancer

**T and N**

Figure 1 Subclassification of invasion depth by superficial carcinoma. m1 Intraepithelial non-invasive carcinoma, namely carcinoma in situ; m2, carcinoma invading the lamina propria; m3, carcinoma extending to or invading the muscularis mucosa; sm1, sm2, and sm3 carcinoma invading the upper, middle and lower one-third of the submucosa, respectively.
Therapy for High Grade Dysplasia and T1aN0

• Intensive surveillance and PPI
• Ablative (PDT, APC, MPEC, Cryo, RFA)
• Endoscopic Resection
• Esophagectomy
Chromoendoscopy showing Barretts, possible cancer
RFA Ablation Catheter
Endoscopic Mucosal Resection
Barrett’s tissue ~500µm

Balloon-Based RFA

EMR

SM

MP
Surgery: Definitive Therapy
with “Front End Risk”
A Rare Opportunity to Save a Life in the Treatment of Esophageal Cancer

![Graph showing survival rates for different stages of esophageal cancer]
Key Question #1 - What constitutes optimal management of T1N0 esophageal adenocarcinoma?

For T1aN0 esophageal adenocarcinoma

- **Recommendation:** Overall survival results with endoscopic eradication therapy equal those achieved with esophagectomy. Therefore endoscopic therapy rather than esophagectomy is recommended when negative margins can be achieved. Patients treated endoscopically (with or without ablative therapy) should undergo close follow-up and surveillance for metachronous or recurrent lesions. Evidence-based guidelines are lacking, but expert recommendations are to perform endoscopic surveillance every 3 months for the first year, every 6 months during the second year, and annually thereafter.

- **Type of Data:** Retrospective data.

- **Grade of Recommendation:** Moderate recommendation, low-quality evidence.
Key Question #1 - What constitutes optimal management of T1N0 esophageal adenocarcinoma?

**cT1b Esophageal Adenocarcinoma**

- **Recommendation:** Given the **substantial risk of lymph node metastasis** in patients with submucosal esophageal adenocarcinoma, **esophagectomy remains the standard of care** for patients with cT1b tumors who are surgical candidates for local control and nodal staging. In the case of inoperability, endoscopic therapy with endoscopic resection can be performed. Adjuvant systemic therapy (chemotherapy or radiation therapy) may also be offered, especially for high-risk lesions, either as primary therapy or adjuvant therapy after endoscopic resection.

- **Type of Data:** Retrospective.

- **Grade of Recommendation:** Weak recommendation, low-quality evidence.
Key Question #2 - How many lymph nodes need to be removed to make it an “adequate” operation, and does the number change after induction therapy?
Key Question #2- How many lymph nodes need to be removed to make it an “adequate” operation, and does the number change after induction therapy?

- Recommendation: By consensus, the National Comprehensive Cancer Network (NCCN) has advocated for a **minimum of 15 nodes** based on the work of Groth et al., Peyre et al., and Rizk et al. However, review of the primary data remains inconclusive for an exact cutoff number. The majority of the studies have recommended at least more than 10 nodes be resected and suggested that more is better, especially in early stage tumors. In centers with the most experience, extent of lymphadenectomy does not correlate with significant risk. Moreover, clinically, it is the early cancers that are most curable with surgery, and it is with them that the danger of compromising outcomes through ineffective lymphadenectomy is greatest. **We therefore recommend the removal of at least 15 lymph nodes as suggested by NCCN guidelines.**

- Type of data: Retrospective studies.
- Grade of recommendation: Strong recommendation, low-quality evidence
Key Question #2- How many lymph nodes need to be removed to make it an “adequate” operation, and does the number change after induction therapy?

Adenocarcinoma vs SCCA, does it change?

- **Recommendation**: Currently, primary data available to help surgeons distinguish the number of lymph nodes they need to resect in adenocarcinoma from the number they need to resect in squamous cell carcinoma are insufficient. Moreover, despite similarities in histology, experience with and characteristics of squamous cell carcinoma in Asian populations, including their susceptibility to the disease and sensitivity to treatments, may remain different from those in Western populations.

- **Type of data**: Retrospective studies.
- **Grade of recommendation**: insufficient
Key Question #2- How many lymph nodes need to be removed to make it an “adequate” operation, and does the number change after induction therapy?

• **Recommendation**: A close working relationship should be established with the pathology service examining the specimens and a strategy developed to maximize the number of lymph nodes examined.

• **Type of data**: Retrospective.

• **Grade of recommendation**: Weak recommendation, low-quality evidence.
Key Question #2- How many lymph nodes need to be removed to make it an “adequate” operation, and does the number change after induction therapy?

*How does preoperative therapy affect node harvest?*

**Recommendation:** Lymphadenectomy should be performed in patients who receive induction chemoradiotherapy in the same manner as patients having de novo surgery. Whether or not chemoradiotherapy affects lymph node yields remains controversial.

- **Type of data:** Randomized controlled trial, retrospective data.
- **Grade of recommendation:** Strong recommendation, moderate-quality evidence.
Key Question #3 - Should multidisciplinary treatment differ for esophageal adenocarcinoma vs. squamous cell cancer?
Many centers no longer offer surgery for squamous cell esophageal cancer – treated with definitive chemoradiation, analogous to head and neck cancer.
**NCCN Guidelines Version 1.2017**

**Esophageal and Esophagogastric Junction Cancers**

### HISTOLOGY

**Squamous cell carcinoma**

### TUMOR CLASSIFICATION

- **cT1b-T4a,N0-Nx**

### PRIMARY TREATMENT OPTIONS FOR MEDICALLY FIT PATIENTS

- **Preoperative chemoradiation** *(non-cervical esophagus)*
  - (RT, 41.4–50.4 Gy + concurrent chemotherapy)
  - or
  - **Definitive chemoradiation** *(only for patients who decline surgery)*
  - (recommended for cervical esophagus)
  - (RT, 50–50.4 Gy + concurrent chemotherapy)
  - or
  - **Esophagectomy** *(non-cervical esophagus)*
  - (T1b/T2, N0 low-risk lesions: <2 cm, well differentiated)

- **cT4b**

  - **Definitive chemoradiation** *(RT, 50–50.4 Gy + concurrent chemotherapy)*
  - Consider chemotherapy alone in the setting of invasion of trachea, great vessels, or heart

### Notes

- See **Response Assessment** *(ESOPH-5)*
- Follow-up *(ESOPH-9)*
- See **Surgical Outcomes** *(ESOPH-6)*
- See **Palliative Management** *(ESOPH-10)*
**SURGICAL OUTCOMES/CLINICAL PATHOLOGIC FINDINGS FOR SQUAMOUS CELL CARCINOMA**

(Patients Have Not Received Preoperative Chemoradiation)

- **R0 resection**
  - Node negative or Node positive
  - $p$ Any T, Any N
  - Surveillance

- **R1 resection**
  - $p$ Any T, Any N
  - Chemoradiation\textsuperscript{x} (Fluopyrimidine-based)

- **R2 resection**
  - $p$ Any T, Any N
  - Chemoradiation\textsuperscript{x} (Fluopyrimidine-based) or Palliative management

*Follow-up (See ESOPH.9)*

*See ESOPH.10*
Key Question #3 - Should multidisciplinary treatment differ for esophageal adenocarcinoma vs. squamous cell cancer?

• **Recommendation**: Multimodality therapy is indicated for patients with locally advanced esophageal cancer (T3-4, N0-N+) for both squamous and adenocarcinoma histologies. The role of neoadjuvant chemoradiotherapy versus neoadjuvant chemotherapy alone remains unknown.

• **Type of data**: Randomized controlled trials.

• **Grade of recommendation**: Strong recommendation, moderate-quality evidence.
Key Question #4 - What constitutes optimal management of T2N0 esophageal cancer?

• **Recommendation:** No current level I data support routine use of neoadjuvant chemotherapy or chemoradiotherapy for clinical stage T2N0 esophageal cancer. There is level II evidence to support **selective use in subgroups of patients with high risk for upstaging** (lymphovascular invasion, high-grade histology, circumferential disease) or suspicion of understaging (dysphagia, bulky tumors, computed tomography imaging results discordant with those from endoscopic ultrasonographic imaging). Clinical judgment and careful consideration of the risks and benefits of treatment versus gained survival benefit should be a shared discussion in collaboration with a multidisciplinary team and the patient. Higher level data in the form of a prospective randomized study, focused on quality of life and overall survival as the primary outcomes, will likely be necessary to determine the utility of neoadjuvant therapy in cT2N0 esophageal cancer.

• **Type of data:** Retrospective.

• **Grade of recommendation:** Weak recommendation, moderate-quality evidence.
Key Question #5 - For GE junction cancers, does an esophageal or gastric surgical approach offer better perioperative and oncologic outcomes?

Though there is no consensus in the literature about the optimal operation for gastroesophageal junction cancer, in general this review supports that Siewert type I cancers be treated with esophagectomy and type III cancers be treated with extended gastrectomy. Taking into account individual surgeon and hospital outcomes, it is reasonable to resect type II cancers through either an esophageal or a gastric surgical approach. In certain instances patient variables (comorbid conditions, frailty, body habitus, etc.) may dictate the optimal approach and trump evidence-based decision-making.
Future Directions
Annals of Surgical Oncology – publication opportunity
Subsequent Editions

• Transition more to a web based publication that will be updated every 2-3 years
• Include/enhance media content online (videos of how to do critical parts of the operation)

• Possible topics for next edition:
  • Peritoneal and pleural malignancies
  • Kidney
  • Bladder
  • Hepatobiliary – primary and metastatic
  • Thymus
  • Neuroendocrine
  • Sarcoma
  • Pediatric Cancer Surgery
  • Ovarian
  • Adrenal
Finding Career Building Opportunities

• Remember the 3 A’s
• Show up, volunteer, follow through
Summary - Operative Standards for Cancer Surgery

• Multi-edition project covering all solid tumors
• Eventually will be web based, multimedia
• Reference for clinical trials
• Educational reference
• A way to improve cancer care
• Launching pad for COC quality initiatives
• Hatching ground for new clinical trial ideas
• A GREAT OPPORTUNITY FOR CANCER SURGEONS AT ALL STAGES OF THEIR CAREER
“People never improve unless they look to some standard or example higher or better than themselves.”

Tyron Edwards, American theologian 1809-1894