Thoracic Surgery Resident Handbook
Introduction

Welcome to the LLUMC/LLVAMC General Thoracic Surgical Service. We are very pleased to have you with us for your rotation. This handbook should serve as a guideline for the management of routine thoracic surgical patients. I stress “guideline” and I stress “routine”. Good judgment should be used in all cases. Remember that judgment comes from experience and experience comes from bad judgment. Rule number one is “ask questions.” Your attendings are available 24 hours a day for questions.

Dr. Wallen can be reached at (909) 553-9929, pager 7940, jmwallen
Dr. Zaheer can be reached at (507) 271-2786, pager 4671, szaheer1

Aside from asking us about patient issues, please feel free to speak to either of us at any time if there are specific things that you want to get out of this rotation or if there are things that we can do to improve the rotation for you and for your piers. We are also available for pre-operative discussions about planning, post-operative discussions for M&M conference.

General Items

- Most patients should have a CXR every day.
  - Last CXR should be a PA and Lateral film in the department
- All conscious patients should have a PCA in the immediate post-operative period.
  - Be cautious with basal rates
- When in doubt, CALL!

Patient Evaluations

Morning Routine

- When you arrive in the morning, the first priority is to perform the pre-operative evaluation of the first surgical patient of the day, including the H&P update, site marking and verification of the surgical consent.
- After the first surgical patient has been checked in, execute any planned discharges.
- Make rounds on the inpatient service.

Admissions

- Let us know
- If it’s one of our patients admit first, ask questions later. In general, we do not want our post-op patients on someone else’s service.
- When in doubt, ask.

Consultations

- If it is a problem listed in the General Thoracic textbooks, we want to be involved. If not, we might still want to be involved.
  - The thorax ends at the ileo-cecal valve. Most of the time.
- Always be courteous with consulting physicians. The iatrogenic pneumothorax today may be an esophagectomy next week.
- All consults need to be seen by an attending within 24 hours, if not sooner.
- Many patients on whom we are consulted would benefit from being on our service. What would you want?
• All patients on the consult list need regular communication with the primary team, in writing, in the medical record. This can be brief where appropriate

Discharges
• Length-of-stay matters!
• Few patients on this service should return to clinic without a PA and Lateral CXR that day.
• Plan early
  o Put discharge orders in the night before whenever possible.
  o Talk to case managers
  o Home health for drains, feeding tubes
  o Nutrition evaluation for tube feeding formulations
  o Physical therapy for ambulation, safety evaluation
  o Who does the patient live with? Most patients should not go home alone.
• Generally, patients should be seen 2 weeks post-discharge. Exceptions might be:
  o Chest tube on Heimlich valve
  o Other drain in place (MIE’s are an exception. Still 2 weeks)
  o You want to check labs again sooner:
    ▪ INR, WBC, Creatinine, K+, etc.
  o You are nervous about waiting 2 weeks.
• Patients should have a review of their outpatient medications and we need to decide what they should be on and what not.
• Do medications need to be converted to elixir?
• Cross reactions with new anticoagulants?
• Do esophageal patients still need their antacids? Why are they on antacids?
  o Nissens: No, never- see exceptions
  o Giants: No, never- see exceptions
  o Hellers: No, never- see exceptions
  o Esophagectomy: Maybe, but, no, never.
  o Exceptions:
    ▪ Collis gastroplasty (usually an H2 Blocker is good)
    ▪ Gastropexy without fundoplication (maybe, not usually)
    ▪ On Plavix
    ▪ History of peptic ulcer disease
    ▪ Zollinger / Ellison syndrome
    ▪ Dialysis patient
    ▪ Other reason (besides reflux) to stay on antacids.

Procedures
• During business hours, please let us know if you are performing a central line, chest tube, bronchoscopy, PleurX etc. In general we would like to supervise procedures. During evening hours, please coordinate procedures with the surgical hospitalist, if available. You do not need to wait for the Hospitalist if they are not available. This is a billing issue, and helps us to continue to have food at journal club, grand rounds and keeping the lights on.
Post-Operative Management

Chest Tube Management

- H2O seal CXRs are not necessary as a routine
- Post-pull CXRs are not necessary as a routine if other tubes exist.
- In patients with 3 chest tubes, the first two can sometimes be D/C’d simultaneously.
- In general, chest tubes with air leaks stay on suction
- Volume of chest tube output has no bearing on the decision to water seal a chest tube
- Acceptable output volume of a chest tube to be removed is individualized based on the type of surgery, character of output and number of tubes in place. Generally, less than 150-200 ml per 24-hour period is acceptable for removal.
- In general, there should be a separate Pleur-evac/Atrium on each chest tube
- Patients who have had a pneumonectomy, must not have a standard pleur-evac. They must have a balanced drainage system, otherwise known as "Dr. Wallen's special pleur-evac at LLU (don't ask me why...). No suction... ever.
  - It looks like this (below). In the VA, they are next to the Pleur-evacs/Atriums in SPD. In Loma Linda, they are in the OR North core. Ask Madeline or Ellen. They are not in central supply.

Esophageal Surgery

Esophagectomy

- Robotic Trans-Hiatal Minimally Invasive Esophagectomy (R-MIE)
- Minimally Invasive and open Ivor-Lewis (MIE)
- Minimally Invasive and open McKeown (MIE)
- Open Trans Hiatal (THE)
- Open Ivor-Lewis, McKeown

General Points:

- No anti-acid medications unless discussed with attending
- Patients go home NPO with J-tube feeds and Blake drain in place
- Estimated length of stay is 4-10 days for MIE
- NO CRUSHED MEDS THOUGH J-TUBE. Elixers, flushes, tube feeds ONLY
  - exception is amiodarone prophylaxis
• Every day that the Foley Catheter stays in needs a **documented** reason.

**POD #0:**
• Amiodarone protocol: 300 mg IV AND 600 mg PO in PACU. 600 mg JT bid x 5 days  
  • Not for QTc > 440 ms or HR < 40 bmp  
• NGT to LWS  
  • Reinsert yourself if dislodged  
• Chest tube to 20cm suction, JP to bulb  
• Flush NG and J-tube q6h with 20ml NS  
• PCA if extubated  
• Rapid am vent wean if not extubated

**POD#1**
• CT to H2O Seal (if present)  
• Transfer to step-down or floor as appropriate  
• Consider D/C Foley

**POD#2**
• Start J-tube feeds at 20 ml/hr. Try to get to goal within 24 hours  
• Serial abdominal exams. Stop feeds immediately for abdominal distention.  
• Foley out if not d/c’d yesterday

**POD#3**
• D/C NGT  
• Plan to get tube feeds cycled to 3pm to 9am cycle.  
• Contact case manager to set up home health for eminent discharge on tube feeds.  
• Liquid medications, wherever possible  
  • Liquid morphine sulfate (20mg / ml) at the VA (0.5-1.5 ml JT q4h PRN)  
  • Roxicet elixir (5/325mg / 5 ml) at LLUMC (5-10 ml JT q4h PRN)  
  • Other acceptable alternatives may be available.

**POD#4**
• May be discharged at any point now if without signs of infection, pain controlled on oral / J-tube medication, independently ambulatory  
• Make sure drain and jejunostomy tube are well secured prior to discharge  
• RTC 2 weeks after discharge  
• Continue NPO

**Laparoscopic Anti-reflux Surgery / Giant Paraesophageal Hernia (no Collis)**
• No anti-acid medications unless discussed with attending  
• Get an early am portable CXR  
• NGT stays in over night and is D/C’d on am rounds if patient not distended and no enlarged stomach on CXR  
• Esophagram first thing in the morning, or if an early case, same day as surgery  
• Start clears after esophagram  
• Home on full liquid diet, advance to soft as tolerated at home  
• RTC 2 weeks with a PA and Lateral CXR

**Belsey Fundoplication**
• No anti-acid medications unless discussed with attending  
• Get an early am portable CXR
- NGT stays in over night and is D/C’d on am rounds if patient not distended and no enlarged stomach on CXR
- Water seal chest tube on am rounds if no air leak
- Esophagram first thing in the morning
- Start clears after esophagram
- Home on full liquid diet, advance to soft as tolerated at home
- Chest tube management is routine
- RTC 2 weeks with a PA and Lateral CXR

**Collis Gastroplasty**
- Routine use of H2 blocker bid for prophylaxis of leak in the Collis segment
- NGT out POD#2
- Then same as above.

**Heller Myotomy**
- See anti-reflux, no Collis

**Lung Surgery**

**Thoracoscopic Lobectomy**
- See chest tube management
- Amiodarone protocol: 300 mg IV AND 600 mg PO in PACU. 600 mg PO bid x 5 days
  - Not for QTc > 440 ms or HR < 40 bmp
  - Not for wedge resection
- Expected length of stay is 3-5 days
- Chest tube output should drop off faster than an open lobectomy.
- Regular diet in am POD#1
- To step down/floor on POD#1 as appropriate.
- H20 Seal in am POD#1 if no air leak
- D/C chest tube POD#2
- RTC 2-weeks with PA and Lateral CXR

**Fast Track Lung Resection**
- For patients with uncomplicated lung surgery and no air leak in OR/PACU
- Patients should have excellent performance status
- D/C Foley prior to leaving operating room
- Patient goes to step-down status
- H20 seal chest tube in PACU prior to first CXR
- Record total chest tube output prior to leaving PACU
- If lung is up on H20 seal, repeat CXR at midnight
- If lung is still up, chest tube can be removed on am rounds POD #1 if:
  - Output since leaving PACU is < 100 ml
  - There is still no air leak
- Amiodarone protocol: 300 mg IV in PACU. 600 mg PO bid x 5 days
  - Not for QTc > 440 ms or HR < 40 bmp
  - Not for wedge resection

**Open Lobectomy**
- See chest tube management
• Expected length of stay is 5-7 days
• Regular diet in am POD#1
• H2O Seal in am POD#1
• D/C chest tube POD#3-4
• RTC 2-weeks with PA and Lateral CXR
• Amiodarone protocol: 300 mg IV AND 600 mg PO in PACU. 600 mg PO bid x 5 days
  o Not for QTc > 440 ms or HR < 40 bpm

**Pneumonectomy**
- Make sure that a standard chest drain system is not used. These patients must have a balanced drainage system to prevent cardiovascular collapse. See picture.
- Be cautious about diet in POD#1. Check the gastric bubble
- Remove CT on am rounds POD#1. Don’t wait for the CXR. It won’t help you.
- To step down/floor on POD#1 as appropriate.
- Progress rapidly to discharge based on success of pain management
- Amiodarone protocol: 300 mg IV in PACU. 600 mg PO bid x 5 days
  o Not for QTc > 440 ms or HR < 40 bpm

![Fig: Pneumonectomy balanced drainage system](image)

**Thoracoscopic Sub-Lobar Resection**
- Water seal chest tube in am POD #1, or evening or POD #0
- If CXR post-H2O seal looks good, D/C Chest tube.
- D/C home POD#1 or 2
- Amiodarone protocol: 300 mg IV AND 600 mg PO in PACU. 600 mg PO bid x 5 days
  o Not for QTc > 440 ms or HR < 40 bpm

**Percutaneous Ablation of Pulmonary Lesions**
- Radiofrequency (RFA)
- Cryoablation
- Microwave ablation

**General**
All patients are admitted postoperatively for pain control
- And/or pneumothorax (15-20%)
STAT CXR immediately post-procedure
AM CXR, PA and Lateral
If pigtail drain is inserted, it is maintained on 40cm H2O suction and D/C’d after am CXR if no PTX and no leak.
Patient can go home after X-rays.
If the patient has a chest tube, it is managed in the standard way. See Chest Tube Management.

**Fever management**
Pan culture for first temp greater than 101.5
Blood culture for second temp greater than 101.5
For fever greater than 101.5 and clinical deterioration, elevated WBC, start piparcillintazobactam 3.375g IV q6h. Continue antibiotics for 7 days if culture negative or 14 days of culture positive.

Pleural Procedures

Blebectomy/Pleurectomy/Pleurodesis/Pleural Tent/Pleurectomy
• Chest tubes on suction for 48 hours from surgery
• Water-seal only if no air leak.
• Remove when output is less than 100 ml / 24 hour period
• Some patients may go home with a Heimlich valve (see appendix)

Drainage/Pleurodesis
• Make sure the patient has a PCA first!
• Pleurodesis Recipe
  o Doxycycline: 500mg Doxycycline in 50ml NS with 20 ml of 2% Lidocaine.
  o Talc poudrage: 5g of talc in 50 ml NS with 20 ml of 2% lidocaine
• Leave these cocktails in for 2 hours. There is no role for rotisserieing your patient. Unclamp the tube and place it immediately to suction, 40 cm.
• Leave on suction for 48 hours.

Pleurodesis with Air Leak
• Lung must stay expanded on H20 Seal
• Hang Pleurevac on an IV pole at maximum extension.
• Inject sclerosant via luer lock adapter on drainage tubing (see image)
Deloculation/Drainage
• Indicated for loculated pleural effusions and loculated empyema
• Quick, minimally invasive, not as much blood loss

Decortication
• This is more involved than wiping “snot” off of the lung. Don’t confuse with deloculation.
• Indicated for chronic effusions, empyema and fibrothorax
• Only can be done by thoracotomy.
• Make sure we have a type and crossmatch
**PleurX Catheters**

- Generally placed in the clinic or at the bedside under local anesthesia.
- Don’t drain the patient right away. It is helpful to leave some fluid for the purposes of teaching.
- Dr. Zaheer sometimes leaves the tube to Atrium drainage.
- Make sure the prescription form (fluorescent yellow folder) is filled out for LLUMC patients. Catheters are kept in the LLU operating room and the VA 3NW clinic.
- For VAMC patients, use CPRS to order drainage supplies to be sent to the home. Drainage kits and catheters are stored in the operating room. Make sure Christine knows about all new PleurX placements so she can arrange home health and get them the bottles.

**Bedside Fibrinolysis**

- Alteplase 6 mg in 20 ml NS
- Leave pigtail clamped for 4 hours.
- Unclamp, then focus on the output over the next 2-4 hours.
  - We will ask you the output
- Be nervous if the patient is on anticoagulation.

**Appendices**

A. Loma Linda Discharge Instructions
   - Cancer patients should follow up in the Cancer Center
   - All other patients should follow up in the International Heart Institute (IHI)

B. Beside Awake Bronchoscopy Loma Linda
   - Call Pulmonary Lab at 88097 or page 0025 to schedule the bronch cart
   - 20 ml of 4% Lidocaine injectable
   - 20 ml 1% lidocaine injectable
   - 20 ml of 2% viscous lidocaine
   - Atomizer
   - Saline irrigation – Bronch cart people will have this
   - Slip tip syringes x3 – Bronch cart people will have this
   - Suction set up at bedside – Bronch cart people will have this
   - Sputum trap / bronch trap / Luken’s trap – Bronch cart people will have this

C. Beside Awake Bronchoscopy VA
   - Pentax HD Video flexible Broncoscope with tower (preferred) (in OR)
   - Olympus non-video flexible Broncoscope with Xenon head light source (in OR)
   - Don’t get the pediatric bronchoscope unless specifically discussed.
   - Neuro-surgical “cottonoids” (in OR)
   - 20 ml of 4% Lidocaine injectable
   - 20 ml 1% lidocaine injectable
   - 20 ml of 2% viscous lidocaine
   - Cross-Action-Jackson forceps (in OR, on Dr. Wallen’s Cart) (or atomizer)
   - Saline irrigation
   - Slip tip syringes x3 (in OR, on Dr. Wallen’s Cart)
   - Suction set up at bedside
   - Sputum trap / bronch trap / Luken’s trap (in OR, on Dr. Wallen’s Cart)
   - Take the scope in its container to the OR devon room across from OR 2. Call SPD Decon to come pick it up. Wipe the tower down and return it to the OR front desk.

D. Setup for Outpatient Chest Tube with Heimlich Valve.
- Chest tube is connected to a Heimlich valve. This manages the air leak.
- Heimlich valve is connected to a bronch trap. This manages the fluid and allows air to escape.
- Make sure the chest tube is well sutured.
- Patient needs a PA and lateral CXR 2 hours after connecting the Heimlich valve set up.

Heimlich Valve

Chest tube to the top (Blue). Luken’s trap to the bottom (clear).
Bronch or “Luken’s” Trap
Connected Assembly
**D. Weekly Schedule**

<table>
<thead>
<tr>
<th></th>
<th>Sunday</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
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<tbody>
<tr>
<td><strong>AM</strong></td>
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<td></td>
<td></td>
<td>6:30 Fellow Lecture</td>
<td></td>
<td>Grand Rounds</td>
<td>7:30 am Thoracic Lecture</td>
<td>7:15 LLUMC Teaching Rounds</td>
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<tr>
<td><strong>PM</strong></td>
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<td></td>
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<td></td>
<td>LLUMC IHI Clinic with Zaheer Cancer Center with Wallen</td>
<td>LLUMC IHI Clinic with Zaheer Cancer Center with Wallen</td>
<td>LLUMC IHI Clinic with Zaheer Cancer Center with Wallen</td>
<td>LLUMC Cancer Center with Zaheer Cancer Center with Zaheer</td>
<td>Day Off Unless Scheduled for Weekend Home Call</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>VA am Thoracic Clinic 3NW or VA OR with Wallen/ Zaheer</td>
<td>LLUMC Thoracic Tumor Board</td>
<td>VA Esophageal Clinic with Zaheer / Wallen</td>
<td>Academic Day</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>VA Pulmonary Nodule Board</td>
<td>VA Tumor Board</td>
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</tbody>
</table>

am lectures start at 6:30 am. General Surgery Residents are not required to attend the cardiac lecture and should go to the VA to get cases started. Thoracic lectures are not every week.

am clinics start at *8:30 am
pm clinics start at 1:00 pm

VA and LLU OR start at 7:30, except on Wednesday, when they start at 9:00 am
HSH OR starts at 7:30 am except Wednesday, which is 9 am

VA Pulmonary nodule board starts at 4pm
VA Tumor Board is 1-2 pm in the Lobby amphitheater (we don’t always go)
LLU Tumor Board is 12-1 pm at LLU in the Cancer Center Conference Room
### E. Surgical Wound Classification

<table>
<thead>
<tr>
<th>Wound Class</th>
<th>Definition</th>
<th>Examples</th>
<th>Reminders</th>
</tr>
</thead>
</table>
| Class I Clean | Operative wound clean  
Non-traumatic, with no inflammation encountered  
No break in technique  
Respiratory, gastrointestinal and genito-urinary tracts not entered  
Cesarean Section, elective, no pre-rupture of membranes or trial of labor | Vascular procedures  
Neurological procedures (inflamed II, infected III)  
Endocrine procedures  
Eye surgery (inflamed II, foreign body III, infected III)  
Orthopedic procedures (unless: trauma III, old wound IV, amputation II)  
Penile prosthesis  
Skin (mastectomy, larnpectomy, lesions, lipoma, cosmetic, TKD IV, old wounds III, infected III, infected IV)  
 exploratory l&P (no bowel involvement II)  
Miscellaneous procedures (lymph node excision/IX unless inflamed III or infected IV, splenectomy, tackhoff cath unless replacement II) | |

| Class II Clean - contaminated | Operative wound clean-contaminated  
Non-traumatic wound with minor break in technique  
Gastrointestinal, respiratory or genito-urinary tracts entered without significant spillage Includes:  
- Transaction of appendix or cholecystic duct in the absence of infected bile or urine  
- Hysterectomy  
- Cesarean Section, emergency involving pre-rupture of membranes and/or trial of labor | Thoracic procedures (except mediastinoscopy I, inflammation III, infected IV, foreign body III)  
GI procedures (including: laparoscopy, colonoscopy, gastroscopy) (gastroplasty III, acute inflammation III, fresh accidental wound III) (Rts III, Uthlasis II)  
GI procedures (infected III)  
Ear surgery (infected III)  
Nose/Oropharynx procedures (infected IV)  
GYN procedures (Gastroenterostomy I, inflammation III, infected IV) | Any wound open for drainage II (except total hip/knee)  
Removing old implants (wires, pins, etc...)  
Re-operation at the same site |

| Class III contaminated | Operative wound contaminated  
Fresh traumatic wound from clean source  
Operative wound with a major break in technique  
Gross spillage from the gastrointestinal tract  
Enter into the genito-urinary or biliary tracts  
When infected orile or bile is present  
Incision encountering acute non-purulent inflammation | Inflammation  
Gross spillage  
Fresh accidental wound | Foreign bodies in a wound (bullets, etc...) |

| Class IV Dirty - infected | Operative wound dirty  
Traumatic wound from dirty source  
Traumatic wound with delayed treatment  
Fecal contamination  
Foreign body  
Retained devitalized tissue  
Operative wound w/ acute bacterial inflammation or perforated viscus  
Operative wound where clean tissue is transected to gain access to a collection of pus | Infected  
I&D abscess  
Wound debridement | Communicable disease (also, hepatitis, TB) is not classified the surgical wound is what is being classified |

| Unclassified | When unable to classify accurately an operative wound | |

### F. ECOG Performance Status for Cancer Patients

**ECOG PERFORMANCE STATUS**

<table>
<thead>
<tr>
<th>Grade</th>
<th>ECOG</th>
</tr>
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<tbody>
<tr>
<td>0</td>
<td>Fully active, able to carry on all pre-disease performance without restriction</td>
</tr>
<tr>
<td>1</td>
<td>Restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature, e.g., light house work, office work</td>
</tr>
<tr>
<td>2</td>
<td>Ambulatory and capable of all selfcare but unable to carry out any work activities. Up and about more than 50% of waking hours</td>
</tr>
<tr>
<td>3</td>
<td>Capable of only limited selfcare, confined to bed or chair more than 50% of waking hours</td>
</tr>
<tr>
<td>4</td>
<td>Completely disabled. Cannot carry on any selfcare. Totally confined to bed or chair</td>
</tr>
<tr>
<td>5</td>
<td>Dead</td>
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### Box 3.14 Fleischner Society Recommendations

**Recommendations for Follow-up and Management of Nodules Smaller than 8 mm Detected Incidentally at Nonscreening CT**

<table>
<thead>
<tr>
<th>Nodule Size (mm)</th>
<th>Low-Risk Patient†</th>
<th>High-Risk Patient‡</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 4</td>
<td>No follow-up needed§</td>
<td>Follow-up CT at 12 mo; if unchanged, no further follow-up‖</td>
</tr>
<tr>
<td>&gt; 4–6</td>
<td>Follow-up CT at 12 mo; if unchanged, no further follow-up‖</td>
<td>Initial follow-up CT at 6–12 mo then at 18–24 mo if no change</td>
</tr>
<tr>
<td>&gt; 6–8</td>
<td>Initial follow-up CT at 6–12 mo then at 18–24 mo if no change</td>
<td>Initial follow-up CT at 3–6 mo then at 9–12 and 24 mo if no change</td>
</tr>
<tr>
<td>&gt; 8</td>
<td>Follow-up CT at around 3, 9, and 24 mo, dynamic contrast-enhanced CT, PET, and/or biopsy</td>
<td>Same as for low-risk patient</td>
</tr>
</tbody>
</table>

Note.—Newly detected indeterminate nodule in persons 35 years of age or older.

* Average of length and width.
† Minimal or absent history of smoking and of other known risk factors.
‡ History of smoking or of other known risk factors.
§ The risk of malignancy in this category (<1%) is substantially less than that in a baseline CT scan of an asymptomatic smoker.
‖ Nonsolid (ground-glass) or partly solid nodules may require longer follow-up to exclude indolent adenocarcinoma.

*Source: Radiology, 2005 Nov; 237(2):395-400.*
### H. Pentax GI Scope Specifications (VA)

<table>
<thead>
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<th>Product</th>
<th>Insertion Tube Diameter (mm)</th>
<th>Instrument Channel Diameter (mm)</th>
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<tbody>
<tr>
<td>UltraSlim</td>
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<td>2.0</td>
</tr>
<tr>
<td>EG-1690K</td>
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<tr>
<td>Slim</td>
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<tr>
<td>EG-2490K</td>
<td>11.6</td>
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<tr>
<td>Large Channel</td>
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<td>3.8, 2.8</td>
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### I. Pentax Bronchoscope Specifications (VA)

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<tbody>
<tr>
<td>EB-1170K</td>
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<tr>
<td>EB-1570K</td>
<td>5.5</td>
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<tr>
<td>EB-1970K</td>
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<tr>
<td>EB-1970TK</td>
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### J. Olympus Scope Specifications (LLU)

#### Olympus Scope Specs

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<th>Bronchosopes</th>
<th>Insertion Tube (mm)</th>
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<tr>
<td>BF-Q180</td>
<td>5.5</td>
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<tr>
<td>BF-1TH190</td>
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<td>2.8</td>
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<table>
<thead>
<tr>
<th>Gastrosopes</th>
<th>Insertion Tube (mm)</th>
<th>Channel (mm)</th>
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<tbody>
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