

**Peer review file**

**Article information:** <https://dx.doi.org/10.21037/jtd-21-1196>

**Reviewer A**

Comment 1: This study describes the experience of 10 years ambulatory care with a digital chest drain system monitored by specialized nurse for a prolonged air leak.

Line 23-26: There is no clear objective(s) listed

Reply 1: The aim of the study is added (page 2; line 26-28)

Changes in the text: The aim of the study is to give further insights in the effectiveness and safety of this treatment.

Comment 2: Line 31: The number of patients needs to be included in the Methods section. What kind of patients were they? Post pulmonary resection or spontaneous pneumothorax?

What does “treatment was successful” mean? What kind of treatment and how do you gauge successful vs unsuccessful?

Reply 2: we modified the text as advised (page 2; line 31-32). Treatment was successful will be clarified in the main text

Changes in the text: 140 patients with prolonged air leak after pneumothorax or pulmonary surgery were included.

Comment 3: Line 43: Outpatient and ambulatory treatment needs to be defined. Are those patients at home with a chest tube? Are they in a rehab facility?

Pleural pathology needs to be defined. Pathology due to cancer? COPD? Apical blebs? That is too general a term and needs to be expanded on.

Reply 3: the text is modified to clarify the introduction. (page 4; line 46-51)

Changes in the text: Outpatient or ambulatory management of pleural pathology for uncomplicated spontaneous pneumothorax, chronic malignant pleural effusions and post-operative prolonged air leak (PAL) is reported in various forms, in example treatment with a chest drain or Heimlich valve at home or in a rehab facility. (1–4)

Comment 4: Line 45: Persistent air leak is used and line 23 uses prolonged air leak. Terminology needs to be consistent. Prolonged air leak needs to be defined (STS definition)

Reply 4: The text is modified. Persistend is changed in prolonged and the STS definition is added with references. (page 4, line 51-56)

Changes in the text:

Prolonged air leak, defined by the Society of Thoracic Surgeons General Thoracic Surgery Database (STSGTSD) as a parenchymal air leak lasting >5 days, is a common clinical problem as a complication of pneumothorax and after lung surgery. PAL complicates 6-18% of lung resections. PAL is associated with increased cost, Aa prolonged in hospital length of stay and other complications.

Comment 5: Line 45-47: How common? Need stats or reference to other studies. Common can be defined very different by different people. Complication of pneumothorax-is that spontaneous pneumothorax? What kind of lung surgery? Lobectomy? Decortication? Apical bleb resection? Much more information with references must be provided. These are very general statements with no references.

Reply 5: Percentages now mentioned with a reference in which different types of surgery are mentioned.

Changes in text:

PAL complicates 6-18% of lung resections. PAL is associated with increased cost, Aa prolonged in hospital length of stay and other complications.

Comment 6: Line 47-48: Define psychosocial burden? Anxiety? Depression? Fear? Imposes hospital facilities means what? I think the word imposes needs to be replaced with overutilizes if that is the meaning you would like to convey

Reply 6: We removed this sentence since we have no references for the psychological burden and the extended length of stay is already mentioned before.

Comment 7: Line 50: Using the word spontaneous pneumothorax sounds redundant in that sentence. Reword it: "In 1975, outpatient treatment for spontaneous pneumothorax was first described in the literature" [reference]. Then explain what the literature described about this topic. Need more information

Reply 7: The sentence is adapted as suggested.

Change in text: In 1975, outpatient tOutpatient treatment for primary spontaneous pneumothorax was first was described in the literaturefor the first time in 1975 for spontaneous pneumothorax. (5) In a series of 226 patients with spontaneous pneumothorax, 167 were managed successfully on an outpatient basis by observation (20%) or by intercostal tube drainage with a flutter valve (54%). (page 4, line 58-62)

Comment 8: Line 50-52: Prolonged air leak is the term used in medical research for this subject. What did the successive reports say? Were lung reduction surgery and pulmonary resections due to cancer the only group of patients that were studied for this whole paper?

Reply 8: Persistent is changed in prolonged and a brief summery of the literature is added. In our study, we also included prolonged air leak in pneumothorax.

Change in text: Cafarotti et al reported low complication rates as well as fewer re-admissions in the outpatient chest drain group, retrospective review by Royer et al reported a potential reduction of inpatient hospital days by 305 days without major morbidity or mortality and Rieger et al suggest that successful outpatient chest tube treatment can be accomplished in select patients. (page 4, line 64-69)

Comment 9: Line 53-54: This sentence needs to be rewritten. Is the Heimlich valve the same as the Thoracic Vent and Pleural Vent? What is the difference? Is one more superior in assessing air leaks? Is one used more frequently over the other and if so, why? An explanation of each of these is needed.

Reply 9: the sentence is rewritten to clarify that the thoracic vent and pleural vent are modern variants of the Heimlich valve.

Change in text: Several devices have been used in ambulatory management such as the Heimlich valves (7,8), it's modern derivatives like the Thoracic Vent and Pleural Vent (9-11) and different types of the Medela Thopaz© digital chest drain systems like the Medela Thopaz©. (1,6,12,13) (page 5, line 70-73)

Comment 10: Line 54-55: You say different type(s) of digital devices but only name one.

Reply 10: Changed in to one digital device.

Comment 11: Line 55-56: Why is it obvious that outpatient or ambulatory management is optimal? Sending a patient home with a chest tube has risks. What makes this optimal? It may not be obvious to readers who are not familiar with this topic.

Reply 11: sentence is changed with findings of reports mentioned before.

Comment 12: Line 58: Monitoring by whom? A home nurse? The surgeon or pulmonologist's office? How often is the patient monitored?

Reply 12: This is described in the specialized care and procedures section in the Methods and Materials.

Comment 13: Line 63-64: What kind of pulmonary surgery? How big was the pneumothorax to be sent home with a chest tube (20%, 30%)? What is a high air leak? The Thopaz provides quantifiable information on air flow. What is considered a high

leak should be defined.

Reply 13: The different kinds of surgery are mentioned, the word high before air leak is removed because all patient with air leak in which drainage was deemed necessary were included.

Changes in text: Patients included in the program had air leak after lung resection (both anatomical and non-anatomical surgery such as wedge resection) pulmonary surgery or a pneumothorax for at least 5 days or a high air leak with expected duration >5 days and were able to perform daily self-care. (page 5, line 82-85)

Comment 14: Line 66-69: Much more information is needed for this to be meaningful. Logistic reasons-is that because it was too far for a nurse to see the patient at home? Was it too far for the patient to return to the hospital in case of an emergency? Logistic for what reason?

Reply 14: Safety is added to this sentence. 30 km was defined as too far for the nurses to visit and too far in case of an emergency.

Comment 15:

-Length of stay-is that hospital length of stay? Was there a difference between patients that went home for a pneumothorax after a pulmonary resection vs spontaneous pneumothorax?

Reply 15: Length of stay is changed to in hospital stay

Comment 16:

-Initial flow- what are the parameters you are using for removing the chest tube? At what flow did you decide it is safe for a patient to go home? If a patient had flows of 1200-1500 with ambulation, were they allowed to go home? Did any of the patients require suction or were they all on waterseal?

Reply 16: High flow such as 1200-1500 ml/min were accepted with a functional drain and stable patient. Most of the patients had the drain on waterseal, in some cases suction was applied.

Comment 17:

-Outcome-what is the outcome? This needs to be defined.

Reply 17: the outcome is defined (page 5; line 89-90)

Comment 18: Line 73-74: Was there just one physician? What were the differences in personal preference and what were the preferences? This needs to be explained.

Reply 18: There was more than one physician, the personal preference part is removed since the type of drain placed depended on indication or comorbidity.

Comment 19: Line 84-85: What is the criteria for cessation of air leak? For example, we pull chest tubes with the Thopaz when the flow is 50 or below for at least 6 hours with no oscillation in flows with movement or coughing. This information needs to be provided to be meaningful.

Reply 19: The definition of cessation is added (page 6; line 106).

Comment 20: Line 87-88: Did the lung have to be fully reexpanded for the tube to be pulled? What if there was a 10% pneumothorax and the patient was asymptomatic? This needs to be explained.

Reply 20: When a chest x-ray showed resolution of the pneumothorax or a stable apical pneumothorax in comparison with the chest x-ray made before discharge the drain was clamped for 3 hours and before a control chest x-ray was made. (page 6; line 107 – 109)

Comment 21: Line 97: “As far we know”—this does not instill much confidence in your findings. You either have clean data, or it is left out. Retrospective studies are based on charted findings which may be incorrect. This is noted during the limitations section.

Reply 21: The smoking part is left out because of the missing data.

Comment 22: Line 102-103: How many people were in each group? How many had surgery vs spontaneous pneumothorax in each group? Are the groups statistically comparable? There is not enough information here.

Reply 22: Chest tube duration is described for the whole group, first the in hospital time for the patients is reported, followed by the ambulatory treatment of all patients.

All patients in our report underwent outpatient treatment.

Comment 23: Line 107: What outcome is considered successful?

Reply 23: The outcome is clarified earlier (page 5; line 89-90) and the text on page 7; line 129-130 was changed.

Comment 24: Line 108: What additional treatment was necessary?

Reply 24: This is mentioned on page 8; line 143-145.

Comment 25: Line 110: The VATS vs open thoracotomy needs to be broken down. How many in each group? Same surgeon for all patients? Same number of ports for the VATS patients if different surgeons? Muscle-sparing thoracotomy? All of this information matters to these findings. There is not enough information here.

Reply 25: The aim of our report is to show outpatient treatment of PAL is possible and safe in select patients. The requested information for different types of surgery and techniques is not available for all our patients due to a switch in electronic patient system. Furthermore, we think this information is too specific for the aim of our report.

Comment 26: Line 117-122: For the additional interventions which patients received which interventions? Those need to be described. For the two patients that were readmitted for observation, was that considered a major complication? Why? All of this needs more information.

Reply 26: Additional interventions are mentioned and described in line 143-145. All events requiring readmission to the hospital were marked as major complications since they could not be solved by our trained nurses.

Comment 27: Line 125-127: If the patient required subsequent VATS for the air leak, was that considered successful treatment? Were those patients already operated on for a pulmonary resection? Because that would be a reoperation and that may not be considered a success.

Reply 27: 80% of patients were treated successful with a chest tube at home, in 15.7% of the original 140 patients no cessation of air leak was achieved with this treatment. This group needed subsequent VATS for the air leak.

Change in text: The ambulatory treatment program with specialized nurses monitoring a digital drainage system as described here resulted in a successful outpatient treatment of prolonged air leak in 80.0% of patients. In 15.7% of patients with PAL subsequent VATS was necessary to solve the prolonged air leak. (page 8, line 147-150)

Comment 28: Line 139-141: Is this study measuring patient satisfaction? That is not noted throughout the study.

Reply 28: We did not measure patient satisfaction, in this section we mention a study in which an increased patient satisfaction is reported for outpatient treatment.

### **Reviewer B**

This manuscript was totally lack of explanation about the program the author had performed for 10 years, which is the most major problem in this manuscript. Therefore, most readers will not understand how useful the program was. We expect that the author's department also had the patients with prolonged air-leak receiving the treatment in the hospital. Comparison between the program and conventional in-hospital treatment can be useful to describe efficacy or advantages of the program.

Reply: Thank you for reading and reviewing our manuscript. We adapted the introduction to explain the aim to our study (page 5 (line 80-81)). In the discussion the retrospective design is mentioned as major limitation, we don't have a comparable data of conventional in hospital treatment available. We agree that a (randomized) comparison is superior, but due to the retrospective design not possible.

Other minor problems are as follows:

1. Two different types of disease including pneumothorax and postoperative lung resection were enrolled in this study, which caused a big bias.

Reply: We agree the big bias with including patients, the aim of our study is to describe that outpatient treatment is possible and safe for different indications in selected patients.



2. I wonder whether all of the patients with 5 days  $\leq$  air-leak were registered in this program.

Reply: Only patients with PAL (>5 days) were included.

3. Explanation of the program was too poor in the materials and methods section. Treatment algorithm can be useful for readers to easily understand the program.

Reply: The methods section of specialized care and procedures was adapted. (page 6; line 104-113)

Change in text: The 'Chance @ Home' program consisted of a team of specialized nurses to be consulted at discharge from hospital. The nurses visit patients at home on a daily basis for control of vital parameters, drain inspection, and dressing if needed. They are available 24/7 for patients in case of emergency, equipment failure, or questions. Patients were readmitted to the hospital after cessation of air leak was established, cessation of airleak was defined as no flow 12 hours on the Thopaz.

When a chest x-ray showed resolution of the pneumothorax or a stable apical pneumothorax in comparison with the chest x-ray made before discharge the drain was clamped for 3 hours. a control chest x-ray was made. If the lung did not collapse, the chest tube was removed subsequently and patients were discharged.

4. I would like to know what ratio the enrolled 140 patients occupied among all patients receiving lung surgery.

Reply: On average 100-120 oncologic resections were performed in our center. The average amount of patients with pneumothorax is not available.

5. When and who decided whether the treatment was successfully completed? Did the department set the deadline of the treatment?

Reply: The outcome and successful treatment was adapted (page 7, line 132; 133)

6. For pneumothorax, success rate was only 53% (28/59), which was not satisfactory for patients.

Reply: This was rephrased in the outcome section (page 8, line 137-138)

### **Reviewer C**

An interesting experience on ambulatory therapy and control for PAL cases. I have some comments on the manuscript and I'd like to thank the authors for reading and considering them.

Comment 1: Although the main objective of this paper is analysing the safety of ambulatory treatment of these patients, the authors include some comments on cost-containment and the advantages of ambulatory therapy over hospital-based. According to some published papers, ambulatory treatment, and intensive control, as the one described in this manuscript, is not saving money, just shifting expenses to ambulatory facilities. The excellent system described here, including 24/7 home nursing care is quite expensive and all aspects of it -including costs derived from training of personnel and number of professionals- should be accounted for before concluding on saves derived from the program. The authors could review this point and compare to the costs of a cohort of cases treated in a conventional way. In the case of finding saves, an interesting manuscript could follow.

Reply 2: Thank you for reading and reviewing our manuscript. The costs aspect is a difficult one, it is true that the outpatient treatment leads to shifting of the expenses. For insurance reasons the patients in our program were still 'virtual' in hospital patients and under the hospitals responsibility. Therefore, the cost reduction may be less than reported in other articles. One of the benefits of the program is creating free beds in the hospital itself. Possible further resource should be conducted in a randomized prospective setting with additional registration of the costs of both treatments.

Comment 2: Outcomes of cases under ambulatory control could be compared to in-hospital cases to emphasize the relevance of findings in case of comparable or superior

outcomes in ambulatory cases.

Reply 2: This is true, but we don't have a comparable database for the conservative in-hospital cases available.

Comment 3: 10% of cases had to be readmitted due to major complications and that is considered a low rate by the authors. In major surgery, 10% of severe complications is not low but rather a medium-high rate.

Reply 3: We defined major complications as an event requiring readmission, the severity of events requiring readmission is variable. The complication rate was comparable with in hospital treatment (page 7, line 156-157)

Comment 4: To my understanding and according to lines 86-88, all patients were readmitted for clamping chest tube and checking by chest X-ray if eventually lung collapsed. Thus, the rate of readmission was 100%. Please explain that point clearly.

Reply 4: The patients were readmitted to the emergency room, the chest tube was pulled after the x-ray and patients were discharged home afterwards, the time in hospital was around 4-5h and patients were not transferred to the wards. We tried to clarify this by changing the text on page 6, line 108 and page 7 line 115)

Comment 5: The acronym PAL is used for prolonged air leak after surgery (see lines 98-99) but not in the case of pneumothorax. PAL should be used in all cases to avoid confounding the reader.

Reply 5: We changed the text on page 7, line 125-127.

Change in text: 81 Patients had prolongedersistent air leak after surgery (PAL) (57.9%) and 59 patients had PAL after spontaneous pneumothorax as cause of persistent air leak (42.1%).

Comment 6: 7 cases were classified as minor complications after the system alarm went on and no intervention was needed. It looks like a system failure in 5% of devices which is quite a high rate. Please re-edit and explain conveniently.

Reply 6: The system alarm went on for different reasons, we also see this in our hospital. Most of the times this is a temporary alarm after occlusion with a blood cloth or kink in the chest tube. An example was added to clarify the minor complication (page 8; line

143)

Comment 7: I'm suggesting editing the conclusions paragraph in a different way: "Ambulatory treatment of persistent pulmonary air leak under nursing control using a digital device is feasible with just 10% of cases readmitted due to significant adverse events".

Reply 7: Thank you for the suggestion, we changed it in the suggested way.

#### **Reviewer D**

Comment 1: It might be worthwhile to define for whom this report? The specialized nurse, general physician, or pulmonologist, or thoracic surgeon?

Reply 1: We like to thank you for the feedback and suggestions. The report is written by pulmonologists but may be worthwhile for the thoracic surgeon as well.

Comment 2: In my best experience, there might be a little disagreement between countries and/or health systems, but most of physicians/pulmonologists/thoracic surgeons, whoever the doctors, probably will not make a discharge order for patients who suffering from with persistent air leak.

Reply 2: With our article, we hope to show ambulatory treatment for PAL is safe and an alternative for in hospital treatment.

Comment 3: In the area of abstract results, the authors only described as "140 patients with persistent air leak". Furthermore, in the area of main results, the authors only described as "81 Patients had persistent air leak after surgery (PAL) (57.9%) and 59 patients had a spontaneous pneumothorax as cause of persistent air leak (42.1%)". The exact/detailed information about disease must be clarified and described.

Reply 3: The type of surgery and inclusion criteria for pneumothorax is mentioned in the materials and methods section (page 5, line 84-87)

Comment 4: The authors mentioned like "Evidence regarding efficiency and safety is nevertheless poor". However, it is hard to agree with authors' opinion, because there are already not a little reports of outpatient chest tube management.

Reply 4: We have rewritten the introduction and changed the sentence to: Data on

efficacy and safety of outpatient treatment with a digital chest drain system is nevertheless poor. (page 5; line 76-77)

Comment 5: Concerning methods area of abstract, it needs more detailed explanation for readers.

Reply 5: Detailed information is added in the methods area, especially the specialized care and procedures part.

Comment 6: In the area of abstract conclusions, the authors mentioned like “a high success rate with a limited complication rate.” However, it is hard to agree with authors’ opinion, because the incidence rate of complication, 17.1%, should not be overlooked.

Reply 2: The conclusion is rewritten to: Ambulatory treatment of prolonged air leak under nursing control using a digital device is feasible with just 10% of cases readmitted due to significant adverse events. (page 10, line 181-183)

Comment 7: I thought that it would be very helpful to the readers if the authors check grammars and typos to improve readability.

Reply 7: Thank you for the feedback, we tried to improve the readability as suggested.

Comment 8: In several parts in manuscript, it's not easy to understand and to read. To improve readability, it needs to proofread the manuscript. Furthermore, the authors must keep instructions for authors. Please, carefully check the draft one more time, especially in the area of references.

Reply 8: With the additional feedback of other reviewers a big part of the manuscript is changed, during the re-editing we tried to improve the readability and handed the manuscript to new proofreader.

## References

McLeer-Florin A, Lantuéjoul S. Why technical aspects rather than biology explain cellular heterogeneity in ALK-positive nonsmall cell lung cancer. *J Thorac Dis* 2012;4:240-1.

Lin X, Li W, Lai J, et al. Five-year update on the mouse model of orthotopic lung transplantation: Scientific uses, tricks of the trade, and tips for success. *J Thorac Dis*

2012;4:247-58.

**Reviewer E**

The authors report the use of an ambulatory digital drainage system to manage prolonged air leaks (PAL) and persistent pneumothorax. This is a timely study as digital drains are more commonly used in thoracic surgery practices and enhanced recovery after surgery (ERAS) programs often aim for early discharge.

Comment 1: It is unclear if the patients who underwent a VATS procedure were managed as an ambulatory patient awaiting a planned surgery or if they required a VATS procedure as a failure of outpatient management. The authors should clarify this in the methods and discussion sections.

Reply 1: We changed the text in the discussion part to clarify the procedure (page 8, line 149-150)

Change in text: In 15.7% of patients with PAL outpatient treatment failed and subsequent VATS was planned to solve the prolonged air leak. These patients were able to wait safely at home for subsequent surgery.

Comment 2: Similarly, the patients managed for a spontaneously pneumothorax need to be classified as (1) no surgical intervention and successful management as outpatient, (2) surgical intervention complicated by PAL or persistent pneumothorax and then managed as an outpatient, (3) no surgical intervention, failed managed as outpatient requiring VATS, and (4) planned VATS, managed as an outpatient awaiting surgery.

Reply 2: The pneumothorax group consisted of 59 patients. (1) In 37 of 59 patients outpatient treatment without surgical intervention was successful. Group (2) is included in the PAL group since classified as PAL after surgery. Group (3) is mentioned in the outcome section as unsuccessful (22/59). Group (04) was not defined in our study. We hope to clarify this in the outcome section, page 7-8; line 127-133)

Comment 3: If available in the dataset the patients with spontaneous pneumothorax should be classified as primary and secondary.

Reply 3: Unfortunately, this data is not available.

Comment 4: The authors should report the number of patients where smoking status was unknown.

Reply 4: The majority of data of smoking status was missing, therefore we removed the smoking status part.

Comment 5: Did the specialized nurse visit the patients at their home or in a clinic setting? This should be clarified in the methods section.

Reply 5: The specialized nurse visited the patients at home, this is mentioned on page 6; line 106-107 in the methods section.

Comment 6: In the discussion section, the authors should explicitly describe the advantages and disadvantages of ambulatory management with a digital device versus non-digital drainage systems.

Reply 6: We found no head to head studies for outpatient management with a digital vs non-digital drainage system. In our discussion, we mentioned literature available.

Comment 7: This manuscript reports a straight forward intervention which is designed to improve patient care while reducing the need for healthcare resources to manage a pneumothorax.

Reply 7: Thank you for the feedback, this is one of the goals of our manuscript.

## **Reviewer F**

Thank you for the opportunity to read your manuscript. The authors have presented an interesting manuscript. I did want to provide some thoughts on ways to enhance the manuscript. Overall, an analysis of risk factors that may point to a decreased likelihood for resolution of PAL with the digital atrium system would be interesting. In addition, some more specific details on those patients that did fail ambulatory treatment – what operations were needed? Please see below for additional thoughts:

Reply: Thank you for the feedback and thoughts on our manuscript. A risk factor for treatment failure in our data is pneumothorax, the outpatient treatment was successful

in 62% vs 93% of PAL after surgery. We added this on page 7, line 140-141.

If treatment failed VATS pleurectomie with pleurodesis was performed, this was added in the complications section on page 8, line 152.

1. The study's inclusion criteria were as follows: air leak after pulmonary surgery, pneumothorax for at least 5 days, or high air leak with expected duration > 5days – can the authors provide more specific information about each group for example, the magnitude of the air leak (forced expiratory, expiratory, constant), the size of pneumothorax seen on CXR etc., the type of operation performed (wedge/segment/lobe)

Reply: Unfortunately, this information was not available for all patients, the magnitude of air leak was only mentioned in 19% of cases. The air leak available was only constant measured. The size of pneumothorax was not routinely described and also only available in 30% of patients. In almost all patients a lobectomy was performed.

2. Pulmonary resection patients and spontaneous pneumothorax patients are two different populations of patients – could they be split into separate groups for analysis?

Reply: On page 8, Line 140-141 we reported the success rate for the pneumothorax and surgery group.

3. Does size of chest tube used have an impact on success rate of ambulatory management?

Reply: The size of the chest tube placed was not available for all patients, so the impact of different size chest tube is not available as well.

4. Is there any information on pulmonary function test values in your patient population?

Reply: In the surgery group, pre-operative pulmonary function testing was available. In the pneumothorax group, most of pulmonary function testing was after the study, if available at all.



5. Were there any surgical interventions performed on the pneumothorax patients?  
How was this decision made?

Reply: If outpatient treatment failed a VATS pleurectomy with pleurodesis (rubbing) was performed.

6. How are your chest tubes secured to the patient who is to discharged home for ambulatory management?

Reply: The chest tube was fixated with 2 stitches a the drain entry. The tube itself was fixated with a plaster on the abdomen so traction was reduced.

### **Reviewer G**

This paper considers an important issue in thoracic surgery. Because of its incidence, prolonged air leakage is associated with considerable use of hospital resources and financial burden. Therefore, any attempts to develop treatment methods that could shorten hospital stay of those patients is welcomed.

The commented paper analyses outpatient treatment of patients with PAL using digital drainage systems supervised by specially trained nurses. Although his idea is appealing, I have some reservations regarding the study itself.

The main reservation is that the study does not provide an answer to the critical question: is the outpatient treatment better (safer, more effective, less expensive, better tolerated etc.) than the standard hospital one?

In consequence, we are not given any clinically important data. This question can only be answered by a controlled trial, preferably randomised.

Reply: We like to thank you for reading our manuscript, we try to answer the questions and feedback as well as possible. We agree that our manuscript does not provide the

answer to your question. Answering this question is not possible with our current data due to the retrospective design and lack of control group. We think our manuscript shows that outpatient treatment is safe with a comparable complication rate as mentioned for standard in hospital care and therefore is relevant for pulmonologists and thoracic surgeons.

Minor reservations are as follows:

#### Materials and Methods - Patients

The inclusion criterion described as "high air leak with expected duration >5 days" is vague. The Authors should state precisely what they considered "high".

Reply: High was removed from this sentence, all patient with air leak with expected duration >5 days were included.

#### Results - Patients characteristics

The Authors state that "18 patients were current smokers (12.9%) and 9 patients (6.4%) were former or nonsmokers". If so, what were the remaining 113 patients?

Reply: The data of the 113 other patients was not readily available, since we only reported 19.3% of total patients smoking status this part was removed.

As stated in the "materials and Methods" section, the inclusion criterion was PAL >5 days. Here, the Authors state "Median in hospital chest tube duration was 5 days (range 1 – 34 days)". Please explain why some patients had the on-hospital chest tube time up to 34 days – according to the inclusion criteria they should have been discharged home with the digital drainage on the 6th day of drainage.

Reply: The inclusion criteria also mentions able to perform self-care since they were discharged home. Some of our patients were not able to perform self-care for different reasons. Also, some of our patients did not want to go home with a chest tube after 5

days, but changed their minds after a longer hospital stay. The last reason is the limited availability of our specialized nurses.