

Research Findings in Thoracic



IMPROVING OUTCOMES AND STREAMLINING
CARE – CLINICALLY PROVEN.

Index

	Page
Multicenter international randomized comparison of objective and subjective outcomes between electronic and traditional chest drainage systems	3
Pompili C, Detterbeck F, Papagiannopoulos K, Sihoe A, Vachlas K, Maxfield MW, Lim HC, Brunelli A Ann Thorac Surg. 2014 Aug;98(2):490-6.	
Impact of the learning curve in the use of a novel electronic chest drainage system after pulmonary lobectomy: a case-matched analysis on the duration of chest tube usage.....	5
Pompili C, Brunelli A, Salati M, Refai M, Sabbatini A Interact Cardiovasc Thorac Surg. 2011 Nov;13(5):490-3.	
The benefits of digital air leak assessment after pulmonary resection: Prospective and comparative study	6
Mier JM, Molins L, Fibla JJ Cir Esp. 2010 Jun;87(6):385-9.	
Postoperative chest tube management: measuring air leak using an electronic device decreases variability in the clinical practice	7
Varela G, Jiménez MF, Novoa NM, Aranda JL Eur J Cardiothorac Surg. 2009 Jan;35(1):28-31.	
The quantification of postoperative air leak	8
Cerfolio RJ, Bryant AS Multimed Man Cardiothorac Surg. 2009 Jan 1;2009(409):mmcts.2007.003129	

Multicenter international randomized comparison of objective and subjective outcomes between electronic and traditional chest drainage systems

Pompili C, Detterbeck F, Papagiannopoulos K, Sihoe A, Vachlas K, Maxfield MW, Lim HC, Brunelli A *Ann Thorac Surg.* 2014 Aug;98(2):490-6.

This study aimed to compare the clinical efficacy and patient satisfaction of a Digital chest drain (Thopaz) when compared to traditional, analogue systems in four countries – USA, UK, China and Italy.

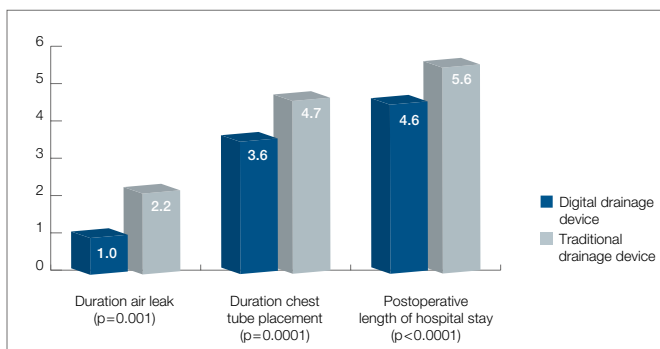


Figure 1: Duration of air leak, chest tube placement and postoperative length of Hospital stay (days).

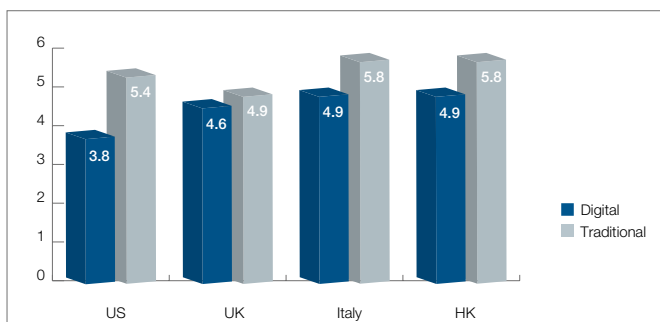


Figure 2: Differences in length of postoperative stay (days) in different centers. (US=United States; UK=United Kingdom; HK=Hong Kong).

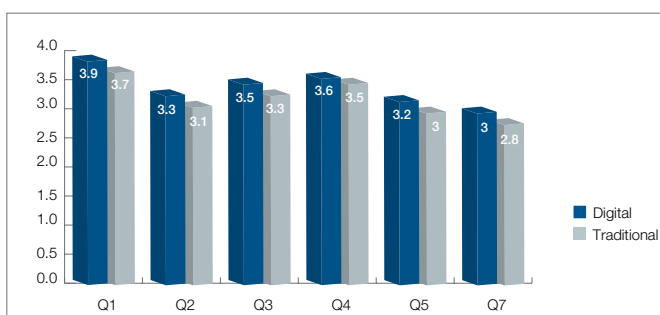


Figure 3: Results of the comparison of patient satisfaction between the 2 groups. Higher scores reflect a more positive perception of the system. (Q=Question).

<p>Question 1: Do you feel that your chest drainage system prevents you from getting out of bed?</p>	<ol style="list-style-type: none"> 1. I cannot get out of bed. 2. I can get out of bed infrequently or with great difficulty. 3. I can get out of bed most of the time but with some limitations. 4. I can get out of bed with minor inconvenience. 5. I can get out of bed all the time.
<p>Question 2: Does your chest drainage system allow you to walk around the room or ward alone?</p>	<ol style="list-style-type: none"> 1. I cannot walk freely. 2. I can walk freely infrequently or with great difficulty. 3. I can walk freely most of the time but with some limitations. 4. I can walk freely with minor inconvenience. 5. I can walk freely all the time.
<p>Question 3: How convenient or inconvenient for the personnel or other patients do you think your chest drainage system is?</p>	<ol style="list-style-type: none"> 1. Very inconvenient 2. Inconvenient 3. Neither convenient or inconvenient 4. Convenient 5. Very convenient
<p>Question 4: How easy to carry around would you consider your chest drainage system?</p>	<ol style="list-style-type: none"> 1. Very difficult 2. Difficult 3. Neither easy or difficult 4. Easy 5. Very easy
<p>Question 5: How socially comfortable do you feel when walking in public areas with this device?</p>	<ol style="list-style-type: none"> 1. Very uncomfortable 2. Uncomfortable 3. Neither comfortable or uncomfortable 4. Comfortable 5. Very comfortable
<p>Question 7: How comfortable do you feel at night in your bed with your chest drainage system (moving in bed, changing position)?</p>	<ol style="list-style-type: none"> 1. Very uncomfortable 2. Uncomfortable 3. Neither comfortable or uncomfortable 4. Comfortable 5. Very comfortable

Table 1: Questionnaire used to assess patient satisfaction of their chest drainage device using a 5-point Likert-type scale.

Conclusions

- I Patients managed with Thopaz experienced a greater than 50% reduction in air leak duration, a shorter duration of chest tube drainage and 1 day reduction in hospital stay when compared with those managed with traditional devices.
- I Subjective outcomes showed higher satisfaction scores for Thopaz with improved ability of patients to arise from bed and a greater convenience for patients and personnel.
- I These findings appeared to be consistent across different health care systems and countries.

Impact of the learning curve in the use of a novel electronic chest drainage system after pulmonary lobectomy: a case-matched analysis on the duration of chest tube usage

Pompili C, Brunelli A, Salati M, Refai M, Sabbatini A
 Interact Cardiovasc Thorac Surg. 2011 Nov;13(5):490-3.

This study aim was to assess the learning duration required for the implementation of a Digital chest drain (Thopaz) into a new facility and to determine the impact of this new chest drain upon length of chest drainage and hospital stay, and the associated financial impact.

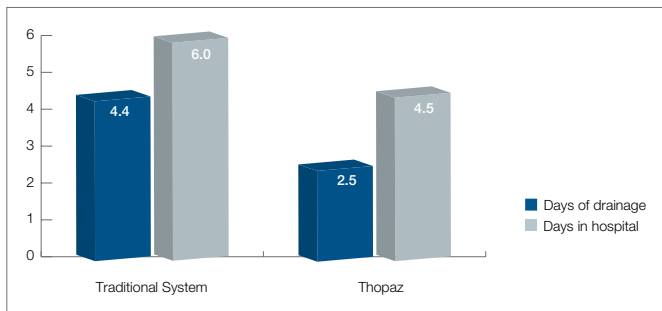


Figure 1: Length of chest drainage and length of hospital stay for patients on traditional systems compared to Thopaz.

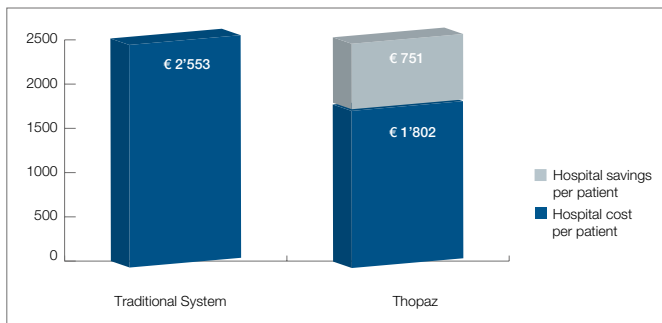


Figure 2: Per patient cost and savings associated with using Thopaz.

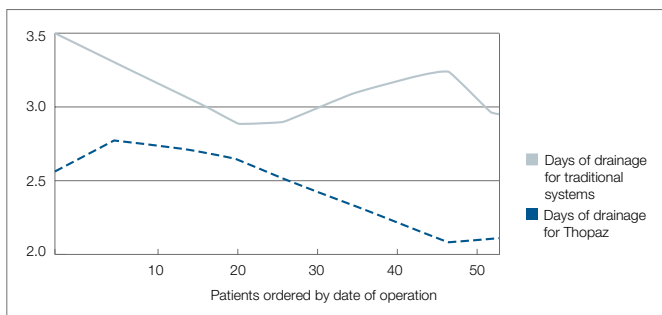


Figure 3: Learning curve of Thopaz, showing that maximum benefit in using Thopaz, as measured by duration of chest drainage, is achieved after 40 patients.

Conclusions

- I Compared with traditional devices, the use of Thopaz was beneficial from its initial application.
- I The learning curve was short and did not affect the efficiency of the system.
- I Thopaz reduced the duration of chest tube drainage and length of stay thereby significantly reducing the costs to the hospital.
- I Study limitations include prior experience with digital drainage devices in this hospital, and that the study population included only pulmonary lobectomies.

The benefits of digital air leak assessment after pulmonary resection: Prospective and comparative study

Mier JM, Molins L, Fibla JJ
Cir Esp. 2010 Jun;87(6):385-9.

The aim of this study was to determine the potential reduction in length of chest drainage offered by using a Digital chest drain (Thopaz) compared to a semi-Digital chest drain (DigiVent), and a traditional device.

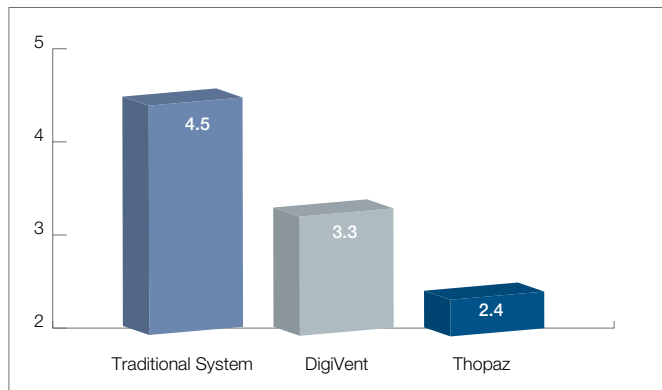


Figure 1: The length of drainage in days for a Traditional Chest Drain, DigiVent and Thopaz.

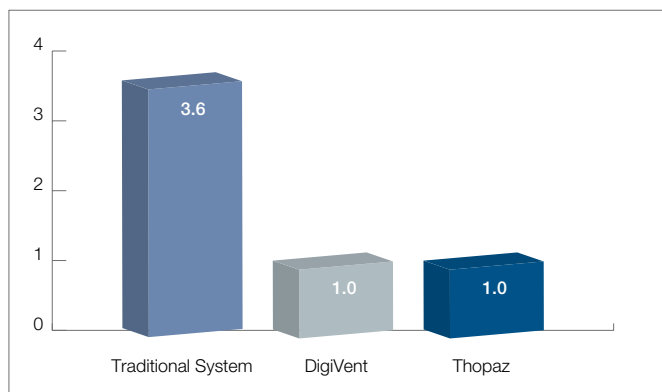


Figure 2: The standard deviation for length of drainage in days for a Traditional Chest Drain, DigiVent and Thopaz.

Conclusions

I The digital and continuous measurement of air leak instead of the currently used traditional systems reduced the chest tube withdrawal and hospital stay by more accurately and reproducibly measuring air leak.

Postoperative chest tube management: measuring air leak using an electronic device decreases variability in the clinical practice

Varela G, Jiménez MF, Novoa NM, Aranda JL
Eur J Cardiothorac Surg. 2009 Jan;35(1):28-31.

This study assessed the degree of inter-observer variability (lack of agreement) between clinicians in assessing the air leak with a Digital chest drain (Thopaz) compared to a traditional chest drain.

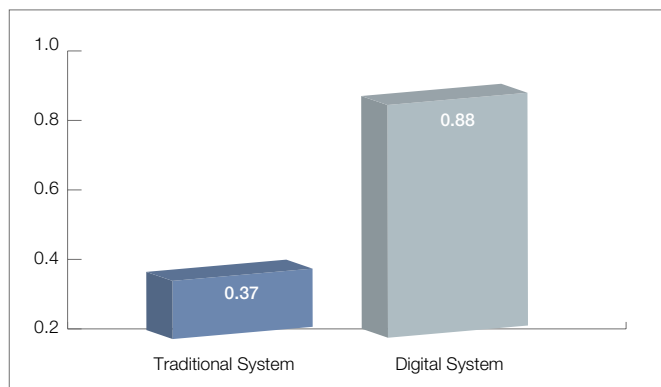


Figure 1: Kappa Coefficient showing agreement between clinical decisions on whether to remove the chest tube for the Traditional System and Digital System. A low Kappa Coefficient suggests poor agreement between observers, whereas a high Kappa Coefficient suggests good agreement between observers.

Conclusion

I There was a high rate of disagreement as to when to remove chest tube after lung resection for the traditional water seal system, and a high rate of agreement when an electronic device with a digital air flow meter was used.

The quantification of postoperative air leak

Cerfolio RJ, Bryant AS

Multimed Man Cardiothorac Surg. 2009 Jan 1;2009(409):mmcts.2007.003129

This study compared traditional chest drains to Thopaz in terms of length of chest drainage in hospital stay in both surgical and pneumothorax patients.

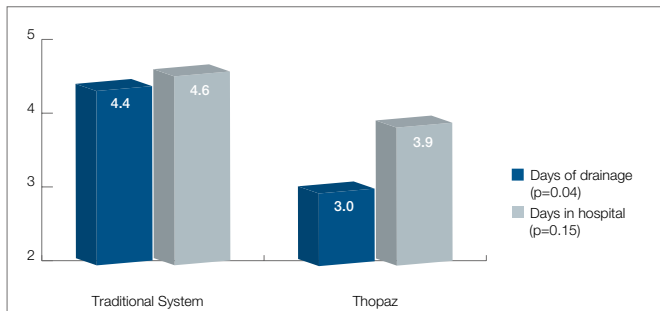


Figure 1: Showing a comparison between a Traditional System and Thopaz in the duration of chest drainage, and length of hospital stay.

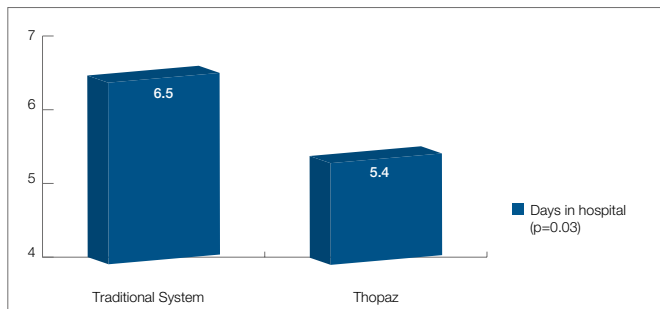


Figure 2: Showing a comparison between a Traditional System and Thopaz in the length of hospital stay for pneumothorax patients.

Conclusion

- I Treatment of air leaks has evolved to improved chest tube management through the use of scientific measures, leading to the earlier removal of chest tubes, decreased pain and morbidity and the early discharge of patients.
- I There is little question that digital air leak devices are the future of the bedside management of air leaks.



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for Healthcare Professionals

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