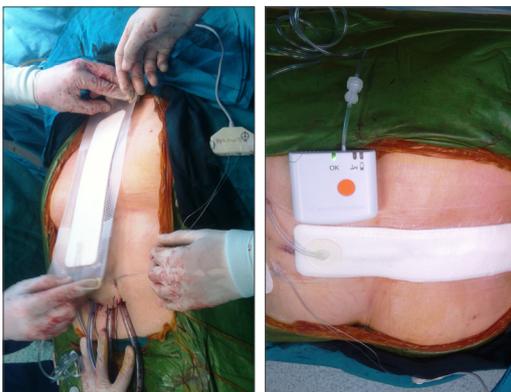


# Application of PICO Single Use Negative Pressure Wound Therapy as a preventive measure for surgical wound infections (SWIs) and dehiscences in at-risk patients undergoing heart surgery

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06/08/2012 Immediately post operative.



06/08/2012 Application of PICO in operating room



6/18/2012 Removal of PICO upon hospital discharge. 10 days after surgery

## Introduction

The patient is a 76-year-old female with multiple risk factors. She presented at the heart surgery department of the Hospital Universitario La Paz for a scheduled mitral valve replacement and prosthesis implantation.

## Treatment

Immediately following surgery, a PICO dressing (10cm x 30cm) was applied to the sutured incision

The PICO Single Use NPWT System was chosen with the aim of preventing post-operative wound related complications. The patient had a number of risk factors which was felt to increase the likelihood of these.

According to the study by Fowler *et al.*, (2005)<sup>1</sup>, certain risk factors for patients undergoing heart surgery are directly related to an increased likelihood of wound related complications. The patient's risk factors and their scoring are detailed below:

RISK FACTOR	SCORE ASSIGNED
Age (for every 5 years over 55, 1 point)	4 points
BMI > 40	9 points
COPD	2 points
Female	2 points

The patient had a total score of 17 points, which according to the data from Fowler's study, corresponded to an estimated risk of surgical wound complication of 7.4%. PICO is an ultraportable Single Use Negative Pressure Wound Therapy System indicated for use on closed surgical incisions.

## Follow-up/Results

After three days of PICO use, the first change of dressing was performed.

Four days after surgery, the patient was transferred to the ward, with controlled blood pressure and heart rate.

Seven days after surgery, the PICO system was removed. The incision's appearance was good and did not show clinical signs of infection.

Ten days after surgery, the patient was discharged from the hospital and 20 days later returned for review, at which time a healed, consolidated incision site was observed.



06/28/2012 Appearance of the scar  
20 days after the surgery

## Conclusion

Performing an economic analysis, the cost of mediastinitis is estimated at between \$18,000 and \$40,000 per episode treated<sup>2</sup>. From this, the following data may be extrapolated:

Assuming 100 patients per year with a similar estimated risk:

Total at-risk patients treated	Estimated incidence of complications	Average cost of an episode of mediastinitis	Cost of treating complications in 100 patients
100	7.4%	€ 23,000	€ 170,200

Assuming the incidence of mediastinitis is reduced with PICO, the result would be:

Total at-risk patients treated	Incidence of complications with prevention	Prevent of 100 patients with PICO	Average cost of an episode of mediastinitis	Cost of prevention in treatment of 100 patients	Prevention savings
100	0%	€ 12,000	€ 23,000	€ 12,000	€ 158,200
100	1%	€ 12,000	€ 23,000	€ 35,000	€ 135,200
100	3%	€ 12,000	€ 23,000	€ 81,000	€ 89,200
100	5%	€ 12,000	€ 23,000	€ 127,000	€ 43,200

This demonstrates the cost effectiveness of a treatment plan categorized by risk.

From the patient's perspective, mediastinitis has other repercussions on his or her well-being, such as prolonged hospital stay, aggressive treatment, pain, low self-esteem and difficulty returning to daily life.

## References

1. Fowler VG, O'Brien SM, Mulhbaier LH et al. Clinical predictors of major infections after cardiac surgery. *Circulation* 2005; 112 (suppl 1): 1358-1365
2. Atkins BZ, Wooten MK, Kistler J et al. Does negative pressure wound therapy have a role in preventing poststernotomy wound complications?. *Surg Innov* 2009; 16(2): 140-6