Adhesions are very common postoperative complications with formation rates of up to 93%.

- Adhesions can lead to chronic pain, infertility or SBO.
- Cost of treating adhesion complications could be up to $2B/yr.
- Many surgeons underestimate the prevalence and severity of adhesions.
- Patients may seek legal reparations if they were uninformed regarding the potential for and risks of adhesions.
- Surgeons can mitigate adhesionsogenesis by meticulous technique.
- Prophylactic barrier products are available; novel adhesion prevention therapies are in development.
- Barriers are controversial in efficacy and cost-effectiveness.

**Barrier Products on the Market**

Interceed – oxidized regenerated cellulose (OMC) absorbable sheet
- Decreases overall and site-specific incidence of adhesions.
- Decreases adhesion score.
- (x) Small size can be used for laparoscopy.
- (x) Decreased efficacy if it contacts blood.

Seprafilm – sodium hyaluronate-based carbamoylmethylcellulose
- Reduces reopening incidence for SBO in colorectal surgery.
- Reduces incidence of site-specific adhesions; may reduce adhesion score.
- (x) Difficult to handle; brittle, cannot be used for laparoscopy.

Adpet – 4%codextrin glucose polymer liquid solution
- Reduces incidence of SBO.
- (x) Contraindicated in bowel repair; can lead to wound complications if instilled in large volume.

Sprayshield – polyethylene glycol (PEG) sprayable gel
- Reduced operation time in trial.
- Reduced adhesion scores in two trials.
- (x) Can be applied laparoscopically; can be applied easily and to larger, general areas.

**Barrier Products Continued**

- Meta-analysis by ten Broek et. al concluded Interceed and Seprafilm can safely reduce clinically relevant consequences of adhesions.
- UpToDate recommendations for pts at high risk for adhesions:
  - Solid barrier for laparotomy
  - Liquid barrier for laparoscopy: sprayshield may be more effective, but Adpet has been studied more.

**Prospective Products**

- Hyalobarrier, Intercoat, Prevaadh, Eisiel, Surgimap – more gels, films, and sheets that have demonstrated some success.

**Cost-Effectiveness**

- Model analysis of Interceed use with C-sections indicated a savings of $837,500 per 1000 surgeries.
- Model analysis of HA-OMC use with radical hysterectomy suggested significant cost savings ($1932 vs $3043) and increased quality of life with barrier use (7.901 vs 7.805 QALYs).
- Study on adhesion-related SBO p/c-section did not demonstrate cost-effectiveness for routine use of barriers.
- UpToDate supports routine barrier use:
  - “the addition of physical barriers is not without risk or cost. The use of the barriers […] achieves operating time, which increases hospital costs, which is compounded further by the fact that for an estimated total of $400 to $700 per procedure, when these barriers accomplish what they are designed to do, the benefit of avoiding future surgery outweighs these issues.”

**References**


**Cost-Effectiveness**

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- Model analysis of Seprafilm’s effect on adhesive bowel obstruction indicated statistically insignificant savings of $1035.
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  - “the addition of physical barriers is not without risk or cost. The use of the barriers […] achieves operating time, which increases hospital costs, which is compounded further by the fact that for an estimated total of $400 to $700 per procedure, when these barriers accomplish what they are designed to do, the benefit of avoiding future surgery outweighs these issues.”

**Discussion**

- Limited data on chronic pain outcomes.
- Area for further research.
- Cost-effectiveness models inherently contain many assumptions.
- Conclusion:
  - Many practitioners need to be aware of the high frequency and morbidity of adhesions. Surgeons should include this risk in informed consent.
  - Good surgical technique is the best way to limit adhesogenesis. Laparoscopy is preferred, using low pressure and treated CO2.
  - Available barrier products are controversial.
  - As there is no current protocol for barrier use, it is at the discretion of the surgeon.