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Centre for Clinical Effectiveness

# Evidence Snapshot

## Surgical masks in the Operating Theatre

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## Question

What is the effectiveness of wearing face masks versus no face mask in the operating theatre?

## Search methods

This review of evidence searched specifically for the effectiveness of masks in the operating theatre setting, in terms of preventing surgical site infection and protecting the surgeon. Evidence related to the use of masks in other settings may be available but not included in this review.

A search of medical databases (Medline and All EBM) and Google was conducted using terms related to masks, operating theatres and surgical wound infections. Searches were conducted from 2010 onwards in Humans and English only.

## Summary of findings

The effectiveness of the use of face masks in the operating theatre has been studied in terms of protecting the patient from the surgical team and the surgical team from the patient. The results of our search are briefly summarised below.

### Protecting the patient from surgical team (e.g. surgical wound infections)

We identified one high quality systematic review published in 2016 that examined infection rates between masked and unmasked groups[1].

#### Inclusion Criteria

The study included adults and children undergoing clean surgery. Clean surgery is defined as “when the operation does not go into organs that may contain bugs such as the lungs, gut, genitals and bladder”. The intervention involved the wearing, by the surgical team (scrubbed and not scrubbed), of disposable surgical face masks compared with no masks.

*Included studies:*
Tunevall 1991 included all types of surgery: clean, clean-contaminated and contaminated.

Chamberlain 1984 involved gynaecological operation lists carried out by masked and unmasked staff.

Webster 2010 randomised non-scrubbed staff per list into masked and unmasked groups. Surgery included obstetrics, gynaecology, general, orthopaedics, breast and urological. Only data relating to clean surgery from all three studies was extracted.

The primary outcomes of the review were the incidence of postoperative surgical wound infection. Secondary outcomes included costs, length of hospital stay, mortality rate.

#### Quality of the evidence

The findings from this review cannot be generalised for several reasons: the studies included only looked at clean surgery, some of the studies did not specify what type of face mask was used and one of the studies did not involve many participants therefore making the findings less credible. The quality of the studies we found was low overall. The way in which participants were selected for the studies was not always completely random, which means the authors' judgements could have influenced the results. More research in this field is needed before making further conclusions about the use of face masks in surgery.

**Results**

**Primary outcome: incidence of postoperative surgical wound infection**

There were 2106 participants in three trials.

Tunevall 1991 reported 13/706 (1.8%) postoperative wound infections in the masked group and 10/723 (1.4%) in the non-masked group (no statistically significant difference: odds ratio (OR) 1.34, 95% confidence interval (CI) 0.58 to 3.07).

Chamberlain 1984 reported no postoperative wound infections in the masked group and 3/10 (30%) in the non-masked group (no statistically significant difference: OR 0.07, 95% CI 0.00 to 1.63).

Webster 2010 reported 33/313 (10.5%) in the masked group and 31/340 (9.1%) in the non-masked group (no statistically significant difference: OR 1.17, 95% CI 0.70 to 1.97).

All three studies showed that wearing a face mask during surgery neither increases nor decreases the number of wound infections occurring after surgery. The review concluded that there is no clear evidence that wearing disposable face masks affects the likelihood of wound infections developing after surgery.

None of the studies considered the secondary outcome measures stated in the review aims.

### Protecting the surgeon from the patient

One guideline[2] of low quality was identified which discussed the use of masks for protecting anaesthetists and other healthcare workers.

The guideline is intended to apply in all areas where anaesthesia, including regional analgesia and sedation, are administered, and covers all associated activities and equipment. The goal of the guideline is to implement strategies that will reduce risks of transmission of infection, based on current evidence.

For prevention of healthcare associated infections the guideline recommends the following:

Standard precautions

Healthcare workers should protect themselves by wearing gloves, protective eyewear or face shields, masks, gowns and/or plastic aprons when there is the likelihood for splashing, splattering or spraying of blood or body fluids, even if not blood stained. Precautions should be implemented for all patients regardless of suspected or confirmed infectious risk.

Gloves, facemasks and theatre caps

Masks should be worn when carrying out sterile procedures under full aseptic conditions.

There is insufficient evidence to recommend the wearing of masks in the operating theatre for all operations however the use of masks for theatre personnel should be in accordance with local hospital policy.

It should be remembered that face masks protect the wearer from contamination during procedures as well as potentially limiting spray contamination of sterile fields when in range.

When masks are worn they should be worn to cover the nose and mouth completely and be firmly secured by the upper and lower tapes. Masks should not be worn around the neck nor taken down to speak. Face masks should be removed immediately after use and replaced for fresh patient interaction

## References


1. Vincent M, Edwards P. Disposable surgical face masks for preventing surgical wound infection in clean surgery. Cochrane Database of Systematic Reviews 2016, Issue 4. Art. No.: CD002929. DOI: 10.1002/14651858.CD002929.pub3. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD002929.pub3/full
2. Australian and New Zealand College of Anaesthetists (ANZCA). 2015. Guidelines on Infection Control in Anaesthesia. http://www.anzca.edu.au/documents/ps28-2015-guidelines-on-infection-control-in-anaes.pdf