



Position statement – Infection control for dermatological surgery

Infection Statement Evidence for the BSDS – Dr Jemma Collins

In order to look at the evidence for safety of dermatological surgery in the outpatient setting and recommendations of such surgery, medline, cinahl and embase searches were performed with the help of a librarian from Aneurin Bevan UHB library. The author also performed a pubmed search. Search terms are detailed in the Appendix.

The question of safety of dermatological procedures in an outpatient setting has been discussed more frequently in recent years. A review published in JAAD in July 2015¹ noted that since the 1980s the setting for dermatological surgery has changed and is now performed mainly in outpatient office settings. The safety of these settings has been questioned both in the UK and the USA. The review noted that several large studies on office based surgery (including dermatological and plastic surgery procedures) have showed low complication rates of 0.3-1.5%. Most adverse events occurred when general anaesthesia was used (such as during liposuction or other large cosmetic procedures). The article references a study from 2004 that revealed lower rates of adverse events and mortality in physician offices than in ambulatory surgery centres. The review concluded: “the evidence clearly supports the safety of dermatologic surgery in the outpatient setting”.

Cook and Perone presented the results of a prospective study into the complications of Mohs micrographic surgery in one academic outpatient practice². 1358 Mohs cases were enrolled and the complication incidence was 1.64%. No patients required hospital admission due to complications. The authors explain that the complications seen were the same as those in a hospital setting in previous studies.

The risk of infection after minor surgery in an outpatient setting has been examined in various studies. A prospective multi-centre trial examining the safety of Mohs surgery in the USA looked at 1550 patients with 1792 tumours³. There were no major complications. Minor complications occurred in 2.6% of the procedures (defined as bleeding requiring healthcare provide intervention; infection; flap/graft/skin edge necrosis at least 10%; haematoma, dehiscence at least 2mm by 2mm). This rate of complications is low, providing evidence of the safety of such procedures, usually performed in an outpatient setting.

The adverse-event data of office-based surgery from mandatory reporting in Florida for 10 years and Alabama for 6 years was published in Dermatological Surgery in 2012⁴. Dermatologists reported only 4 of the 309 adverse events in Florida, with no deaths. As the 2015 report in JAAD noted, the majority of severe adverse events or deaths were due to cosmetic procedures performed under a general anaesthetic. 56.5% of deaths were as a result of cosmetic procedures,

and of those 67% were performed under general anaesthesia. 28% of cosmetic complications and 14% of total complications were due to liposuction. The data from Alabama supported the findings that the majority of complications (42%) were as a result of cosmetic procedures, particularly those under general anaesthetic. None of the deaths reported in Alabama were due to cosmetic procedures. The paper concludes that medically necessary surgical procedures do not pose an “emergent hazard” to patients and highlighted in particular that those performed by dermatologists have an extremely low complication rate. They also note that those complications during or after dermatological procedures appeared to be isolated, unexpected and possibly unpreventable. This study supports the safety of medically indicated surgical procedures performed by dermatologists in an office-based setting.

In 2002 a conference was held on office-based surgery in North Carolina. A report from this conference discussed the ideas presented during the conference, looking at the factors involved in safety of office-based surgery⁵. The report notes results from a study of basal cell carcinomas that concludes that the outcome of excision of these in an office-based setting was no worse than in a hospital setting. Surgery in an office-based setting also appears to be more cost effective. The authors conclude by noting that office-based procedures actually have decreased infection rates and increased patient satisfaction.

A large audit of complications due to dermatological surgical procedures was published in the Australasian Journal of Dermatology in 2012⁶. This prospective audit looked at 2370 dermatological procedures over 55 weeks in one skin cancer centre in Western Australia. They describe how excisional surgery was performed using an aseptic technique as follows: “local skin preparation with a solution of chlorhexidine gluconate (15 mg/30 mL) and cetrimide (150 mg/ 30 mL), sterile disposable drape, sterile disposable gloves and sterile surgical instruments. The plastic sleeving for the hyfrecator handle and tip were clean but not sterile. Surgical gowns and masks were not used. Following the procedures, non-sterile white petrolatum was applied to the sutured wound, followed by sterile Interpose (Mutligate Medical Products, Yennora, NSW, Australia) and non-sterile Fixomull (BSNMedical, Hamburg, Germany). Patients removed these dressings after 24–48 h, and were instructed to clean the sutured wounds daily and apply white petrolatum.” They did not use prophylactic oral antibiotics routinely, and did so only when indicated, for example flaps, grafts, infected lesions and Mohs surgery. Non-sterile gloves were used for small procedures such as curettage and shaves. The clinical team used alcoholic chlorhexidine hand rub and not formal surgical scrub for all procedures. Out of 2370 procedures, only 13 became clinically infected (0.5% of all procedures). These required oral antibiotics only. Only 0.21% of the Mohs cases had a post-operative infection. In total there were 56 complications, including patient dissatisfaction with scar, bleeding, infection, graft failure, suture reaction, wound dehiscence and necrosis of flap. The authors highlight that although there has been some debate over the need for full sterile conditions in dermatological surgery, the rate of infections are low. They also note that at the time of writing that there was no conclusive evidence either way of the need for surgeons garb (gowns, masks, head coverings, shoe covers etc) for dermatological surgery. The

article concludes by stating that dermatological surgery including Mohs procedures can be performed with a low risk of complications in an office-based setting.

Looking at a slightly different aspect of outpatient surgery, a retrospective study in New Zealand examined both adverse events and the use of monitoring during outpatient surgery⁷. This study used a written questionnaire to New Zealand dermatologists. 31 out of a total of 46 dermatologists responded. The majority of respondents did not use any preoperative or intraoperative monitoring. Infection rates were less than 3.5%, consistent with previous literature and bleeding occurred in less than 2%. The paper concludes that high-risk patients should be identified prior to surgery and extra precautions made, but for most patients intraoperative monitoring is not required.

With regards to the airflow in the dermatological theatre or operating room itself, there is a paucity of literature. For some types of surgery, for example prosthetic joint surgery, the use of laminar airflow in the operating theatre is established. Studies have shown that laminar airflow reduces the bacterial load and particles in the air. There is still however controversy on the need for such systems and their effect on surgical site infection rates⁸. A review of orthopaedic surgery concluded that laminar airflow does not conclusively affect post-operative wound infections⁹. A guideline published in the *Journal of Hospital Infection* looked at minor surgical procedures and minimal access interventions¹⁰. The article lists excision of BCC, lipoma and cysts as examples of minor surgical procedures. The recommendation is that natural ventilation is sufficient for minor surgical procedures.

All the evidence reviewed in this literature search supports the practice of dermatological surgery in an office-based or outpatient setting. This is the norm for such procedures across the world including the USA, Australia, New Zealand and the UK. Studies have concluded that outpatient dermatology procedures are safe and that complication rates, including infections, are low. I found no evidence to suggest that performing dermatological surgery in an office or outpatient setting is inappropriate. The evidence for the use of main theatres and full sterile technique (including surgical garb) is limited in dermatological surgery. I found no evidence to suggest that the use of specific airflow is required for dermatological surgery and guidelines state natural ventilation is adequate. The use of main theatres or similar to perform dermatological surgery and the extensive protocols that such a setting requires is therefore not recommended according to the current evidence.

References

1. Hansen TJ et al, Patient Safety in Dermatological Surgery, *Journal of the American Academy of Dermatology*, 2015. 73(1) pp. 1-12
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3. Merrit BG et al, The safety of Mohs surgery: a prospective multicentre cohort study, *Journal of the American Academy of Dermatology*, 2012. 67(6) pp. 1302-1309
4. Starling J et al, Determining the Safety of Office-Based Surgery: What 10 years of Florida Data and 6 Years of Alabama Data Reveal. *Dermatologic Surgery*, 2012. 31 pp. 171-177.
5. Efficacy, Safety, and Cost of Office-Based Surgery: A Multidisciplinary Perspective. *Dermatologic Surgery*, 2003. 29, pp. 1-6
6. Elliott TG et al. Office based dermatological surgery and Mohs surgery: A prospective audit of surgical procedures and complications in a procedural dermatology practice. *Australasian Journal of Dermatology*. 2012. 53, pp. 264–271
7. Chan BCY and Patel DC. Perioperative management and the associated rate of adverse events in dermatological procedures performed by dermatologists in New Zealand. *Australasian Journal of Dermatology*. 2009. 50, pp. 23–28
8. McHugh SM et al. Laminar airflow and the prevention of surgical site infection. More harm than good? *Surgeon*. 2015. 13(1) pp. 52-58.
9. James M et al. Current Evidence for the Use of Laminar Flow in Reducing Infection Rates in Total Joint Arthroplasty. *The Open Orthopaedics Journal*. 2015. 9 pp. 495-498
10. Humphreys H et al. Guidelines on the facilities required for minor surgical procedures and minimal access interventions. *The Journal of Hospital Infection*. 2012. 80(2) pp. 103-109

Appendix

Searches performed:

Database: Embase <1996 to 2016 Week 19>

Search Strategy:

-
- 1 exp airflow/ (27791)
 - 2 exp laminar airflow/ (551)
 - 3 1 or 2 (27791)
 - 4 exp minor surgery/ or minor procedures.mp. (1577)
 - 5 exp ambulatory surgery/ (8505)
 - 6 4 or 5 (10016)
 - 7 3 and 6 (17)
 - 8 limit 7 to (human and english language) (16)

Database: Embase <1996 to 2016 Week 19>

Search Strategy:

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- 1 exp dermatology/ (29898)
 - 2 exp skin surgery/ or dermatological surgery.mp. (58934)
 - 3 exp dermatological procedure/ (7555)

- 4 1 or 2 or 3 (95347)
- 5 *operating room/ (3983)
- 6 theatres.mp. (1464)

- 7 5 or 6 (5210)
- 8 4 and 7 (30)
- 9 limit 8 to (human and english language) (23)

Database: Embase <1974 to 2016 May 05>
Search Strategy:

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- 1 *dermatological procedures/ or *dermatological procedure/ (451)
 - 2 exp surgical technique/ (1214870)
 - 3 *skin surgery/ (1954)
 - 4 1 or 2 or 3 (1216256)
 - 5 dermatology/ (37598)
 - 6 Sterilization.mp. (36944)
 - 7 4 and 5 and 6 (7)
 - 8 limit 7 to (human and english language) (5)

Database: Ovid MEDLINE(R) without Revisions <1996 to April Week 4 2016>
Search Strategy:

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- 1 airflow.mp. (8064)
 - 2 laminar airflow.mp. (93)
 - 3 exp Minor Surgical Procedures/ (342)
 - 4 minor procedures.mp. (235)
 - 5 exp Ambulatory Surgical Procedures/ (6819)
 - 6 1 or 2 (8064)
 - 7 3 or 4 or 5 (7334)
 - 8 6 and 7 (1)

Database: Ovid MEDLINE(R) <1946 to April Week 4 2016>
Search Strategy:

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- 1 *Dermatologic Surgical Procedures/ (3206)
 - 2 exp Surgical Procedures, Operative/ (2649766)
 - 3 skin surgery.mp. (302)
 - 4 1 or 2 or 3 (2649812)
 - 5 exp Dermatology/ (15559)
 - 6 exp Sterilization/ (26808)
 - 7 4 and 5 and 6 (8)
 - 8 limit 7 to (english language and humans) (7)

Database: Ovid MEDLINE(R) without Revisions <1996 to April Week 4 2016>

Search Strategy:

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- 1 exp Dermatology/ (7291)
 - 2 exp Dermatologic Surgical Procedures/ or dermatological surgery.mp.
(20746)
 - 3 skin surgery.mp. (119)
 - 4 dermatological procedure.mp. (2)
 - 5 1 or 2 or 3 or 4 (27885)
 - 6 *Operating Rooms/ (3929)
 - 7 theatres.mp. (700)
 - 8 6 or 7 (4435)
 - 9 5 and 8 (13)

Database: Ovid MEDLINE(R) without Revisions <1996 to May Week 1 2016>

Search Strategy:

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- 1 office dermatology.mp. (2)
 - 2 office based.mp. (2805)
 - 3 outpatient department.mp. (2509)
 - 4 1 or 2 or 3 (5304)
 - 5 minor procedures.mp. (236)
 - 6 minor surgery.mp. or exp Minor Surgical Procedures/ (899)
 - 7 dermatologic surgery.mp. or exp Dermatologic Surgical Procedures/ (20948)
 - 8 skin surgery.mp. (120)
 - 9 5 or 6 or 7 or 8 (22102)
 - 10 exp Safety/ (52692)
 - 11 4 and 9 and 10 (3)
 - 12 limit 11 to (english language and humans) (3)

Pubmed:

Airflow AND theatre