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3M
Science.
Applied to Life.™
The greatest risk factor for SSI is a patient's skin.[1,2]
Create a sterile surface.

Every surgical patient risks Surgical Site Infection (SSI)

The skin can contain over

1 million

bacteria per square centimeter.[3]

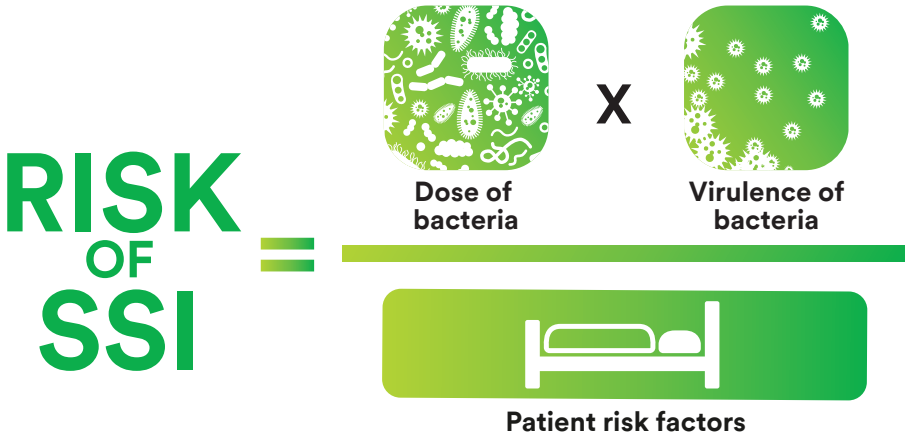
It takes only

10 1 cm² actual size

microbes per square centimeter* to cause a surgical site infection (SSI).[4]

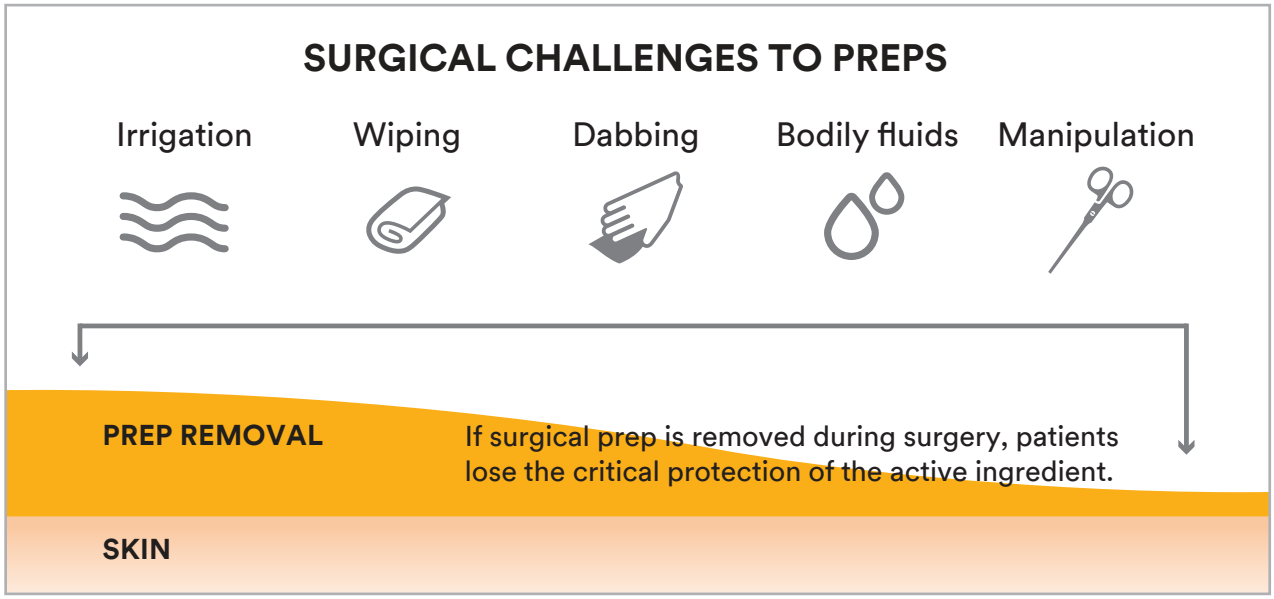
*When implant is present

Reducing a patient's microbial load is critical to avoiding an SSI. The Centers for Disease Control and Prevention (CDC) measures SSI risk using three distinct variables.[5] The variable we can most affect: the dose of bacteria on the skin.



Start with the proper prep

A proper skin prep reduces a patient's bacterial load throughout the perioperative process, providing both immediate and lasting protection. But not all preps perform the same during surgery. Preps need to stay on the skin to remain effective. Preps can be removed during surgery by saline irrigation, dabbing with sponges or gauze, or contact with bodily fluids.



Resisting removal during surgery

3M™ DuraPrep™ Surgical Solution (Iodine Povacrylex [0.7% available iodine] and Isopropyl Alcohol, 74% w/w) Patient Preoperative Skin Preparation was scientifically formulated to protect the prep from removal during surgery. It contains 3M™ Prep Protection Film, which dries to form a persistent and durable layer of protection on the patient's skin.[11]

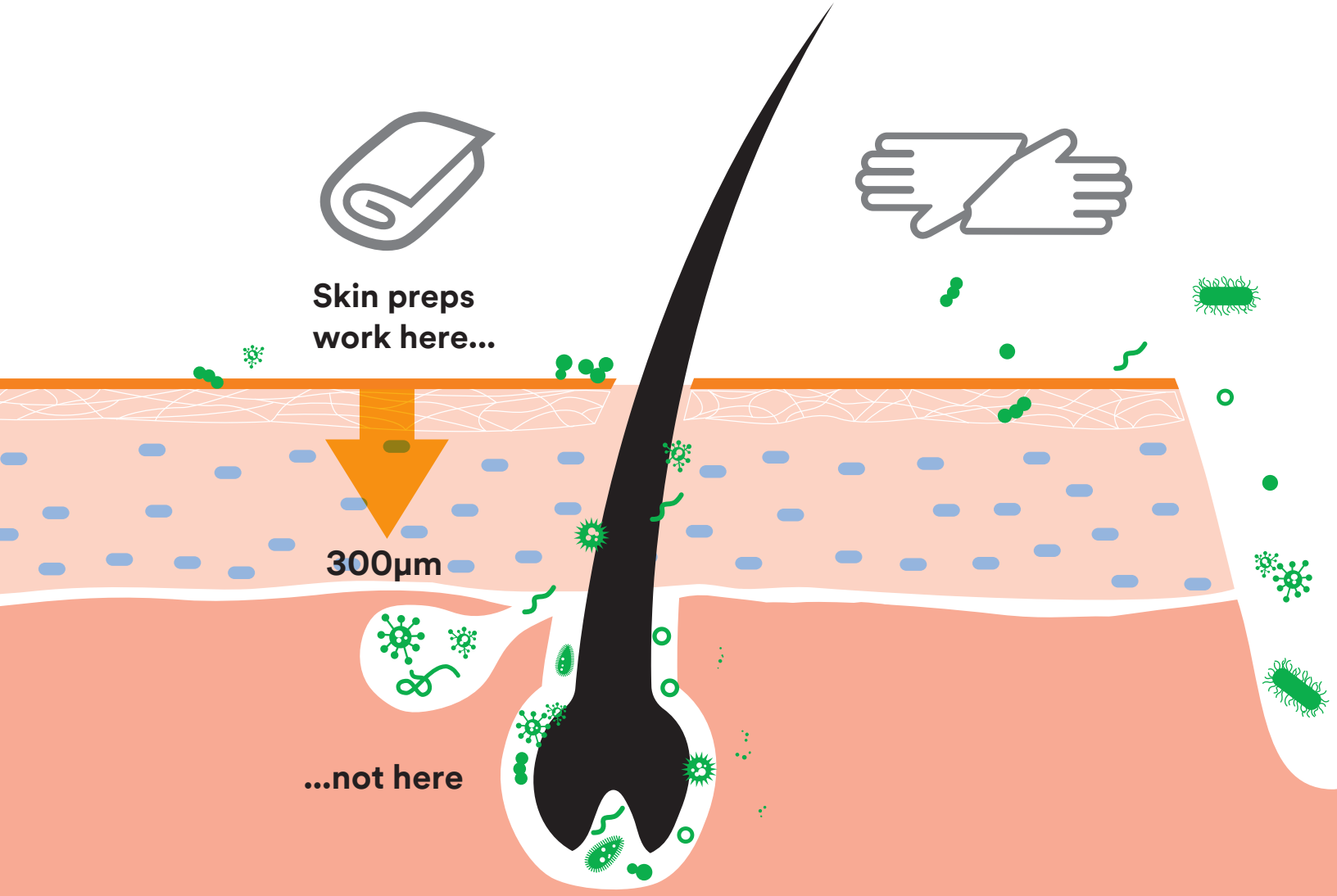
Reducing incise drape lift

Incise drape lift at the edge of an incision can allow bacteria to migrate into the surgical wound. In fact, in one study drape lift was associated with a six-fold increase in SSI.[13] The 3M Prep Protection Film in 3M DuraPrep surgical solution acts as a primer that helps a drape stick to the patient's skin to protect against incise drape lift.

Preps alone are not enough

While skin prep antiseptics reduce microbes, they work primarily on the skin surface, not in the deeper layers of the skin. Chlorhexidine gluconate (CHG), in skin preps, for example, does not penetrate into the deeper layers of the skin. Below a depth of 300 microns, CHG concentration may not be effective for killing bacteria.[16]

Without additional protection, residual bacteria on the skin's surface and bacteria that migrate from the hair follicles can be picked up by items that touch the skin and transferred into the incision, increasing the patient's risk of infection.

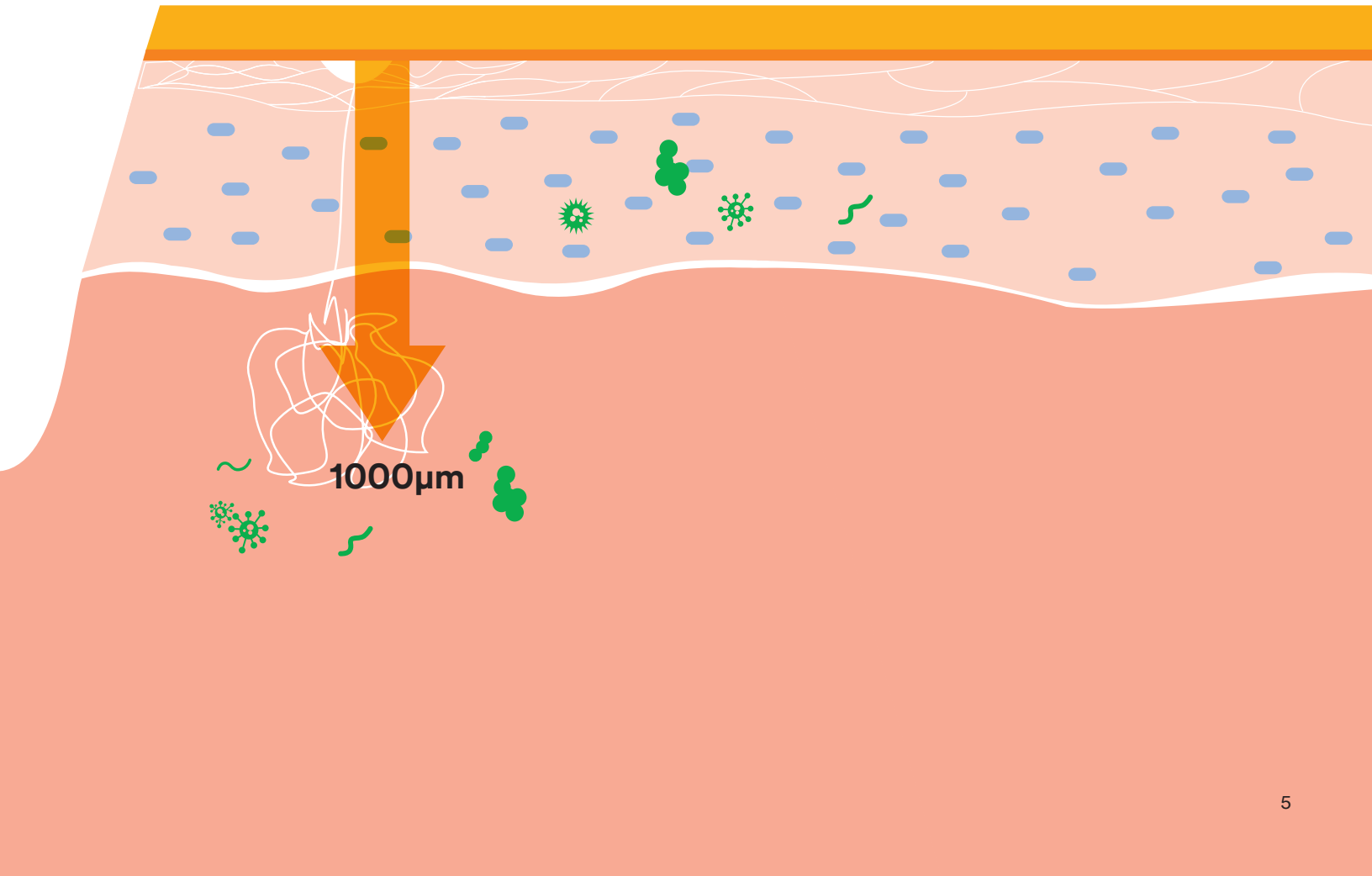


Skin preps are antimicrobial and reduce the number of microbes on the skin surface, but bacteria in the deeper layers may remain.

Use an incise drape

An incise drape creates a physical barrier to prevent objects like instruments, gloves and sponges from coming into contact with the patient's skin, reducing the risk of contamination that could cause a costly and potentially devastating SSI. In a recent ex vivo study on human skin, the iodine in 3M™ Ioban™ 2 Antimicrobial Incise Drape was shown to be present at concentrations effective against MRSA at a depth of 1,000 microns, in the deeper layers of the skin, where hair follicles are present.[17]

3M™ Ioban™ 2 Antimicrobial Incise Drape creates a sterile barrier, and iodine from the drape has been shown to be present in the deeper skin layers.[17]



A human and financial cost

SSIs can affect a patient's quality of life and create stress for patients and their families. And they place a huge operational and financial burden on health care systems and providers. Using evidence-based practices to reduce skin microbes — before and during surgery — and creating a barrier to microbial migration can help reduce the risk of an SSI.

Occur in
2-5%
of all patients undergoing inpatient surgery[6]

Cost on average
$20,785
per patient[7]

Affect
quality of life[8]

Result in
2-11X
increased risk of mortality[6]

Increase length of stay by
7-11 days[6]

Increase
nursing care[9]

Lower
patient satisfaction[9]

Increase
litigation[9]

Approximately
5X as likely to result in readmission[10]

Help lower SSI risk and costs

Bejko study results[18]

In a study published in 2015, 3M™ Ioban™ 2 Antimicrobial Incise Drape was associated with lower SSI risk and reduced cost when compared to a non-antimicrobial incise drape in cardiac surgery.

Method and objective:
New prospective randomized study of patients undergoing cardiac surgery. 1,616 patients were matched based on risk factors. 808 patients with skin prep and a standard clear incise drape, and 808 patients with skin prep and 3M™ Ioban™ 2 Antimicrobial Incise Drape. Examined the efficacy of 3M Ioban 2 antimicrobial incise drape versus a standard clear incise drape and evaluated cost-effectiveness of each.

SSI rate reduction of 71%
At 6.5%, overall incidence of SSIs for patients who received a non-antimicrobial incise drape was significantly higher than the 1.9% of those who received 3M™ Ioban™ 2 Antimicrobial Incise Drapes (p=0.001).

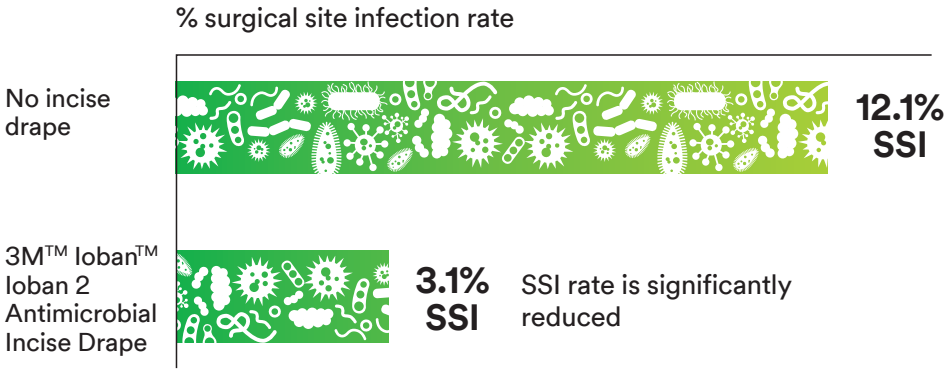
Costs were calculated for each of the procedures as: cost of drape + daily cost of VAC + hourly cost of the operating room for wound debridement + daily cost in hospital ward + cost of ICU.

$828,000 (€773,495) = total cost savings or about $1,025 per patient with 3M Ioban 2 incise drapes.

Reduce wound infection rates

Yoshimura study results[19]

In a retrospective study involving liver resection surgery, 3M Ioban 2 incise drape, compared with no incise drape, was associated with a significant reduction in postoperative wound infection rates, from 12.1% to 3.1% (p=0.01).



Method and objective:
Retrospective study from 1994 to 2001 looking at 296 patients undergoing liver surgery. Examined the impact on wound infection using just a skin prep vs. a skin prep and 3M Ioban 2 Incise Drapes.

Using a sterile surface to fight SSIs

The risk of SSI is a real — and devastating — possibility for every surgical patient. Using an effective prep along with an antimicrobial incise drape reduces bacterial load and creates a sterile surface to minimize wound contamination.

Ordering Information

3M™ DuraPrep™ Surgical Solution (Iodine Povacrylex [0.7% available iodine] and Isopropyl Alcohol, 74% w/w) Patient Preoperative Skin Preparation

3M Cat No.	Product	Coverage	Size	Items/ box	Boxes/ case
8630	3M DuraPrep surgical solution	Application covers 450 sq. in. (15 in. x 30 in.); ideal for large procedures — thoracic and CV, spine, total hip and knee, C-section, major abdominal.	26 mL	20	1
8635	3M DuraPrep surgical solution	Application covers 80 sq. in. (8 in. x 10 in.); ideal for mid-size procedures — biopsies, foot and hand, angiography, head and neck procedures.	6 mL	50	1

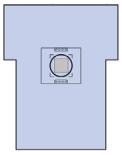
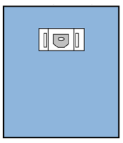
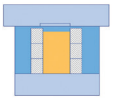
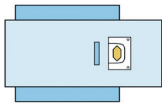
3M™ Ioban™ 2 Antimicrobial Incise Drapes EZ with plastic liner

3M Cat No.	Product	Adhesive area	Items/box	Boxes/case
6640EZ	3M Ioban 2 Antimicrobial Incise Drape EZ	13" x 13" 35cm x 35cm	10	4
6650EZ	3M Ioban 2 Antimicrobial Incise Drape EZ	23" x 17" 60cm x 45cm	10	4
6648EZ	3M Ioban 2 Antimicrobial Incise Drape EZ	23" x 23" 60cm x 60cm	10	4
6651EZ	3M Ioban 2 Antimicrobial Incise Drape EZ	23" x 33" 60cm x 85cm	10	4

3M Steri-Drape 2 With Breathable Incise Film

3M Cat No.	Product	Adhesive area	Items/box	Boxes/case
2037	3M Steridrape 2 Incise Drape	38cm x 25cm	10	4
2040	3M Steridrape 2 Incise Drape	28cm x 41 cm	10	4
2045	3M Steridrape 2 Incise Drape	50cm x 45cm	10	4
2050	3M Steridrape 2 Incise Drape	60cm x 60 cm	10	4

3M Specialty Drapes with Incise Area

3M Cat No.	Product	Overall size	Adhesive area	Items/ box	Boxes/ case
7965	Biocade Sheet with Clear Incise Pouch (Cesarean Section) 	254cm x 307cm	30cm x 30cm	5	1
1064	Biocade Opthalmic Procedure Sheet Oval Aperture 	158cm x 182cm	9cm x 1.7cm	20	1
6682	Cardiovascular Drape 	325Cm x 200cm	78cm x 43cm	8	1
6687	Craniotomy Drape with Ioban 2 Incise Pouch 	196cm x 406cm	36.8cm x 21.4cm	10	1

For more information on how to use a sterile surface to fight SSIs, or to **request a free demonstration**, contact your 3M account representative.

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References

1 Reichman DE, Greenberg JA. Reducing surgical site infections: a review. *Rev Obstet Gynecol.* 2009;2:212–21.
2 Cheadle WG. Risk factors for surgical site infection. Surg Infect (Larchmt). 2006;7 Suppl 1:S7–11.
3 Percival SL, Emanuel C, Cutting KF, Williams DW. Microbiology of the skin and the role of biofilms in infection. *Int Wound J.* 2012;9:14–32.
4 Feldman G, Fertala A, Freeman T, et al. Recent advances in the basic orthopedic sciences: osteoarthritis, infection, degenerative disc disease, tendon repair and inherited skeletal diseases. In: Austin MS, Klein GR, ed. *Recent Advances in Orthopedics.* 1st ed. New Delhi. Jaypee Brothers Medical Publishers (P) Ltd; 2014: 256.
5 Mangram AJ, Horan TC, Pearson ML, Silver LC, Jarvis WR. Guideline for prevention of surgical site infection, 1999. *Infect Control Hosp Epidemiol.* 1999;20:247-78.
6 Anderson DJ, Podgorny K, Berrios-Torres SI, et al. Strategies to prevent surgical site infections in acute care hospitals: 2014 Update. *Infect Control Hosp Epidemiol.* 2014;35(6):605–27.
7 Zimlichman E, Henderson D, Tamir O, et al. Health care-associated infections: A meta-analysis of costs and financial impact on the U.S. health care system. *JAMA Intern Med.* 2013;173:2039-46.
8 Whitehouse JD, Friedman ND, Kirkland KB, Richardson WJ, Sexton DJ. The impact of surgical-site infections following orthopedic surgery at a community hospital and a university hospital: adverse quality of life, excess length of stay, and extra cost. *Infect Control Hosp Epidemiol.* 2002;23:183-89.
9 Prevention and treatment of surgical site infection. NICE Web site. https://www.nice.org.uk/guidance/cg74/evidence/full-guideline-242005933. Published October 2008. Accessed January 30, 2017.
10 Kirkland KB, Briggs JP, Trivette SL, Wilkinson WE, Sexton DJ. The impact of surgical-site infections in the 1990s: Attributable mortality, excess length of hospitalization, and extra costs. *Infect Control Hosp Epidemiol*. 1999;20:725-30.
11 Roberts AJ, Wilcox K, Devineni R, Harris RB, Osevala MA. Skin preparations in CABG surgery: a prospective randomized trial. *Comp Surg.* 1995;14:724,741–4,747.
12 Stahl JB, Morse D, Parks PJ. Resistance of antimicrobial skin preparations to saline rinse using a seeded bacteria model. *Am J Infect Control.* 2007;35:367–73.
13 Alexander JW, Aerni S, Plettner JP. Development of a safe and effective one-minute preoperative skin preparation. *Arch Surg.* 1985;120:1357-61.
14 Data on file 3M Study EM-05-013561, 3M Health Care.
15 Swenson BR, Hedrick TL, Metzger R, Bonatti H, Pruett TL, Sawyer RG. Effects of preoperative skin preparation on postoperative wound infection rates: a prospective study of 3 skin preparation protocols. *Infect Control Hosp Epidemiol.* 2009;30:964-71.
16 Karpanen TJ, Worthington T, Conway BR, Hilton AC, Elliott TSJ, Lambert PA. Penetration of chlorhexidine into human skin. *Antimicrob Agents Chemother.* 2008;52:3633–6.
17 Casey AL, Karpanen TJ, Nightingale P, Conway BR, and Elliott TSJ. Antimicrobial activity and skin permeation of iodine present in an iodine-impregnated surgical incise drape. *J Antimicrobial Chemotherapy.* 2015.
18 Bejko J, Tarzia V, Carrozzini M, et al. Comparison of efficacy and cost of iodine impregnated drape vs. standard drape in cardiac surgery: study in 5100 patients. *J Cardiovasc Transl Res.* 2015;8:431–7.
19 Yoshimura Y, Kubo S, Hirohashi K, et al. Plastic iodophor drape during liver surgery operative use of the iodophor-impregnated adhesive drape to prevent wound infection during high risk surgery. *World J Surg.* 2003;27:685–8.