



The Application of Evidence Based Bundle Approach to Reduce Surgical Site Infection in Geriatric Hip Fracture Patients – A Single Centre Experience

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Geriatric Hip Fracture Hemiarthroplasty

- Common Orthopaedic Procedure
- **At least 1 Surgeon + At least 1 Assistant**
- Done by *Trainee* or *Specialist*



Background

- The Surgical Site Improvement Program and Audit for Orthopedic surgeries has been developed in 2009 in AHNH
- **10.3%** Surgical Site Infection (SSI) in Geriatric Hip Hemiarthroplasties in 2010
- **8%** SSI in Geriatric Hip Hemiarthroplasties in 2012



Surgical Site Infection (SSI)= Dreadful Complication

(Mangram A, Horan T, Pearson M, et al. Guideline for prevention of surgical site infection, 1999. Infect Control Hosp Epidemiol 1999;20:247–78.

Katarincic JA et al. Local Modalities for Preventing Surgical Site Infections: An Evidence-based Review. J Am Acad Orthop Surg 2018 Jan.)

 Morbidities  Quality of Life

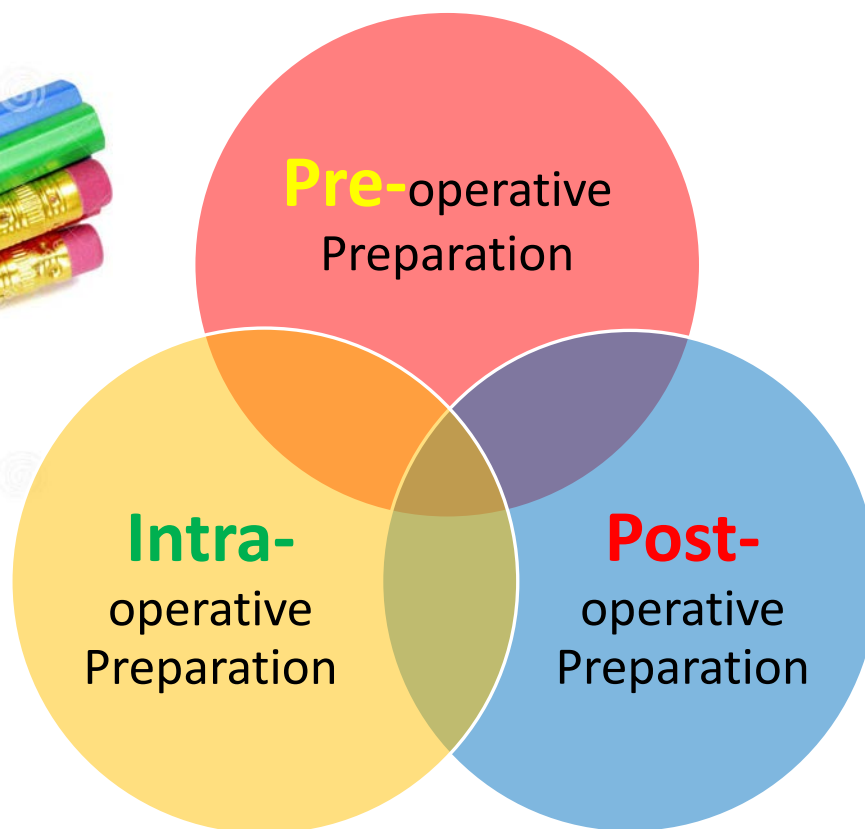
 Hospital length of stay by 7 -14 days

 Likelihood of ICU admission by 60%

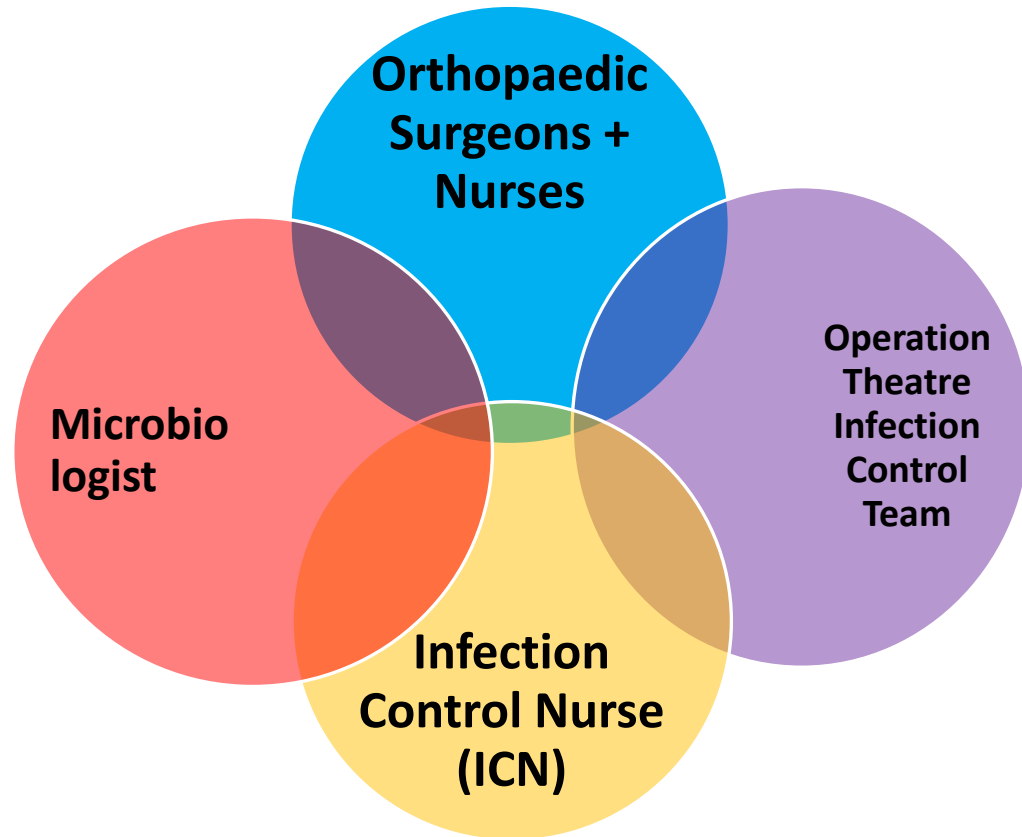
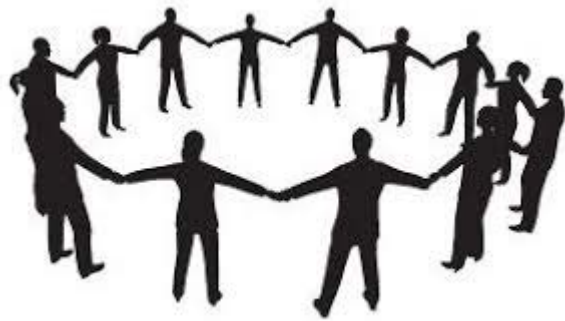
 Median total direct Costs by 300%

 2 Risks of Rehospitalization & Death

BUNDLE Approach since 2012

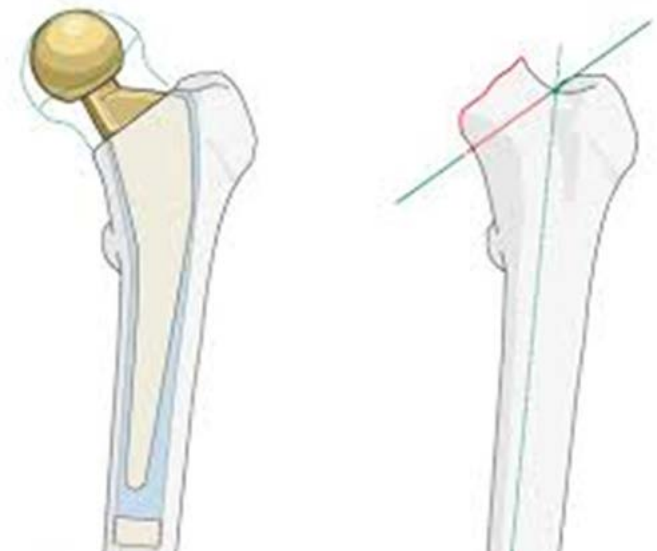


Multidisciplinary Teamwork



Methodology

- Objective:
 - To reduce surgical site infection (SSI) in hemiarthroplasty operation in geriatric hip fracture patient
- Target group:
 - > 65 years old
 - Fracture neck of femur
 - Hemiarthroplasty operation



A. Pre-operative Preparation

- **MRSA screening**
 - Performed for all potential hemiarthroplasty cases for Hip fractures
 - For positive cases:
 - Vancomycin is used as prophylactic antibiotics.
 - Decolonization is carried out

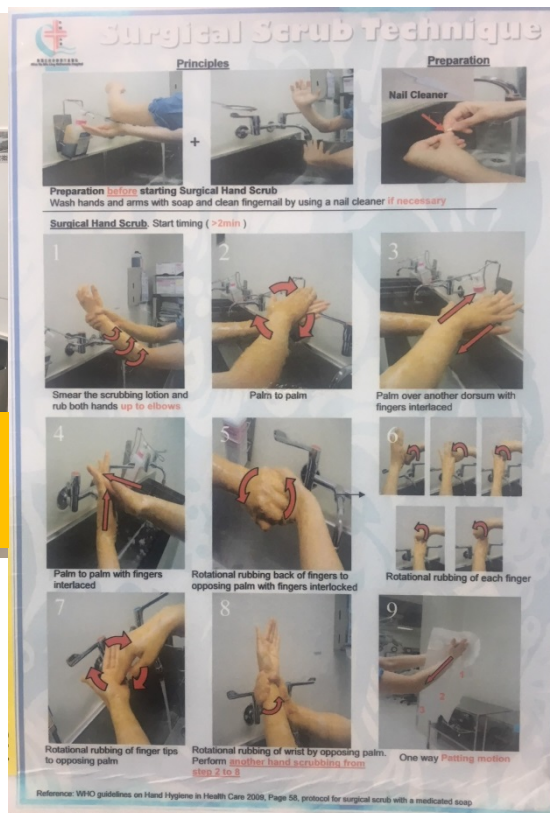


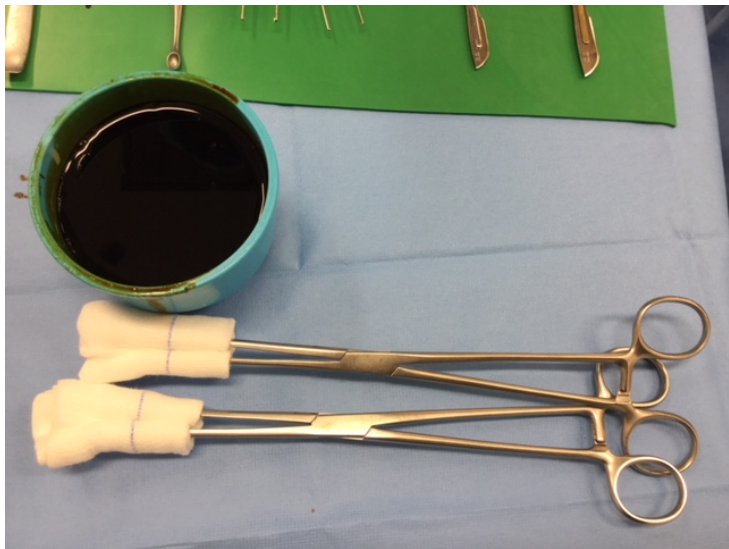
Preoperative Skin Preparation by Chlorhexidine Bathing

1 day before operation / on operation day



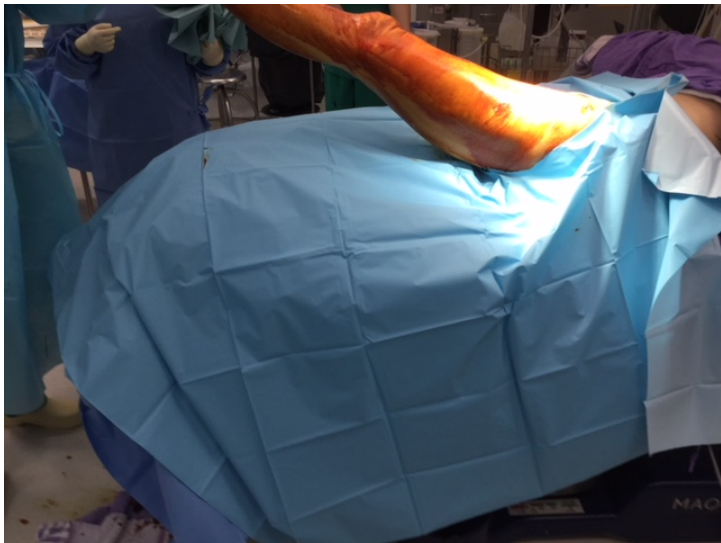
B. Intra-operative Preparation





Step I.

Povidine iodine disinfection before draping

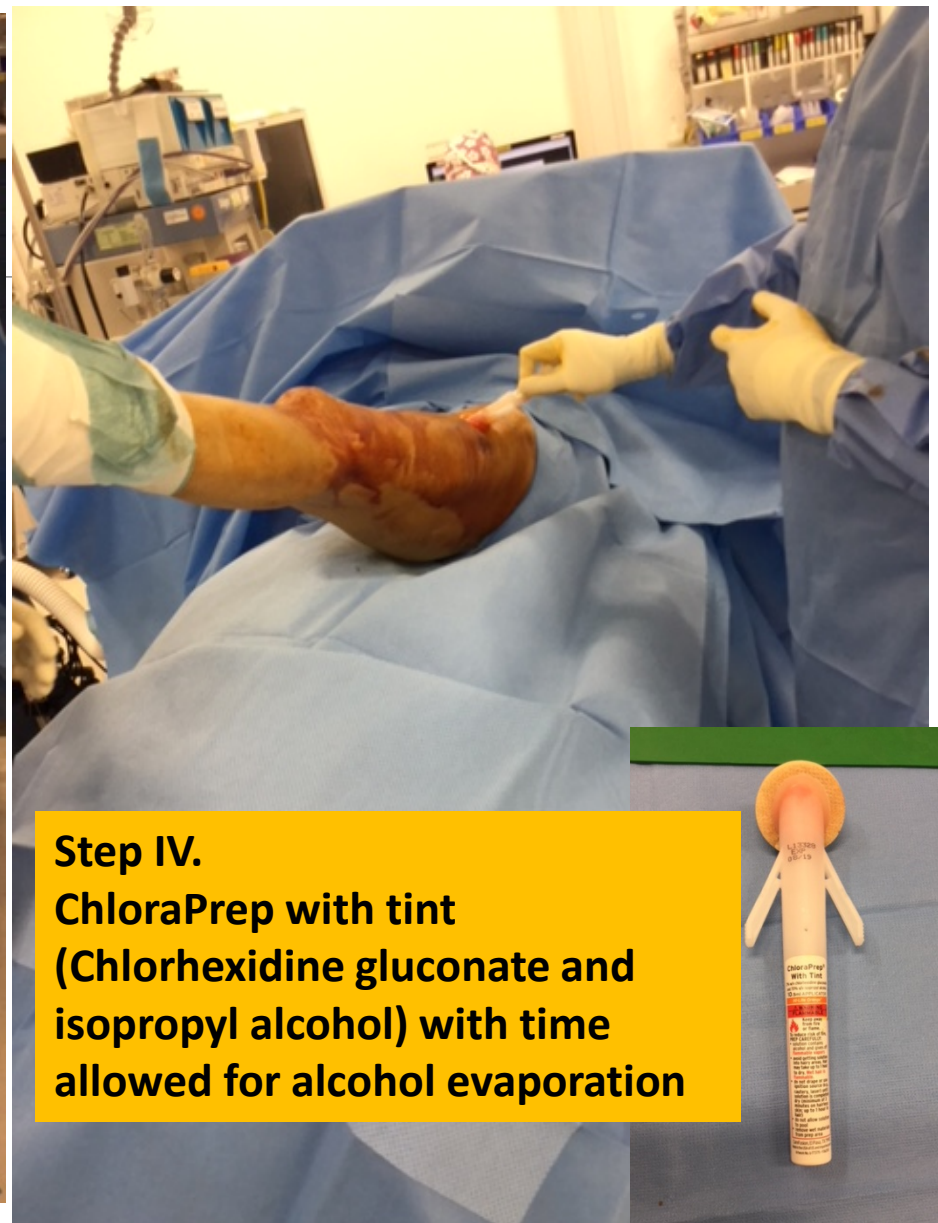


Step II.

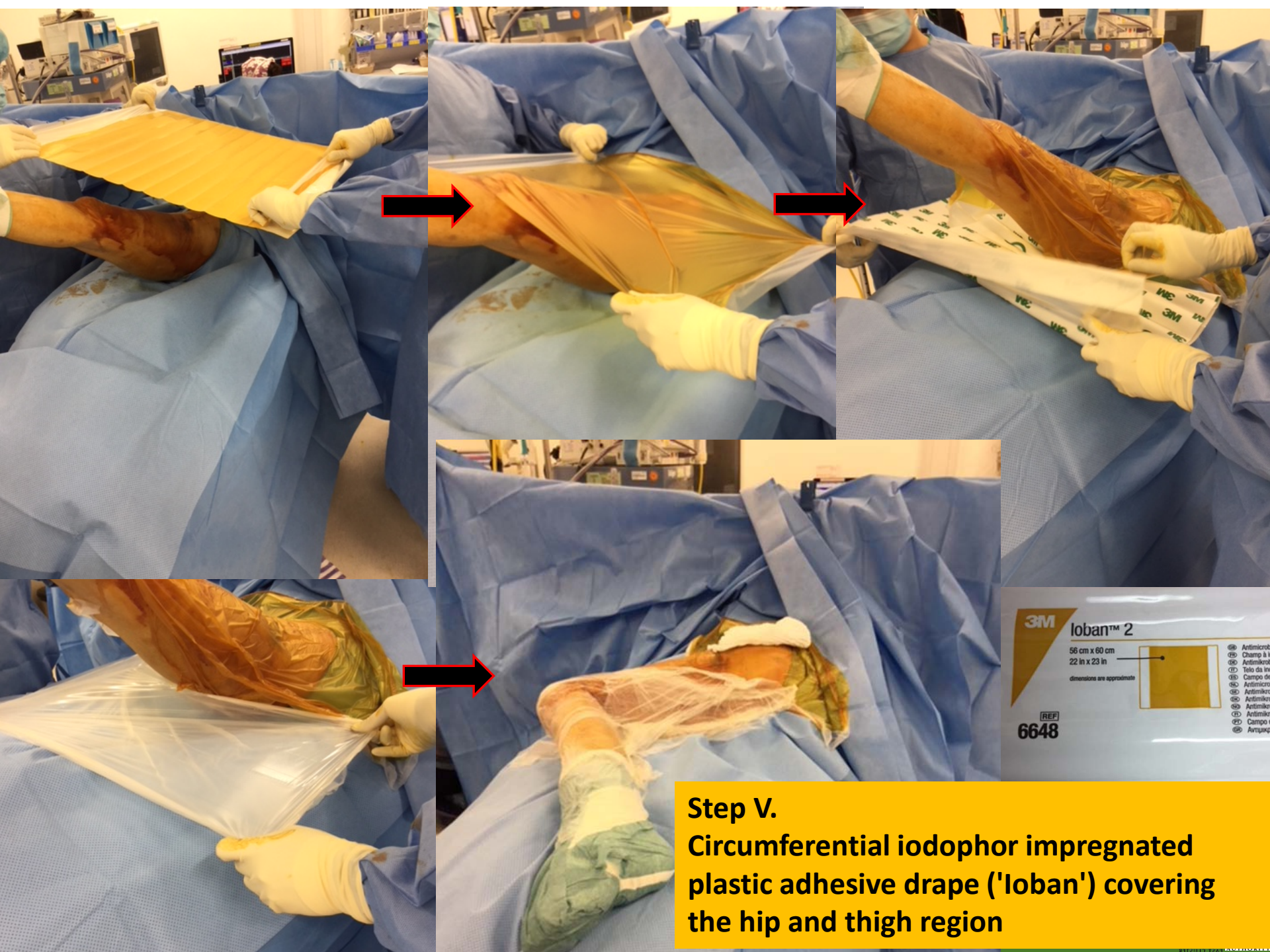
Double-sponge disinfection with povidine iodine upon water-tight draping



Step III.
Coverage of the knee to distal
region with a sterile plastic
sheet wrapped by crepe
bandage



Step IV.
Chloraprep with tint
(Chlorhexidine gluconate and
isopropyl alcohol) with time
allowed for alcohol evaporation



Step V.
Circumferential iodophor impregnated plastic adhesive drape ('Ioban') covering the hip and thigh region

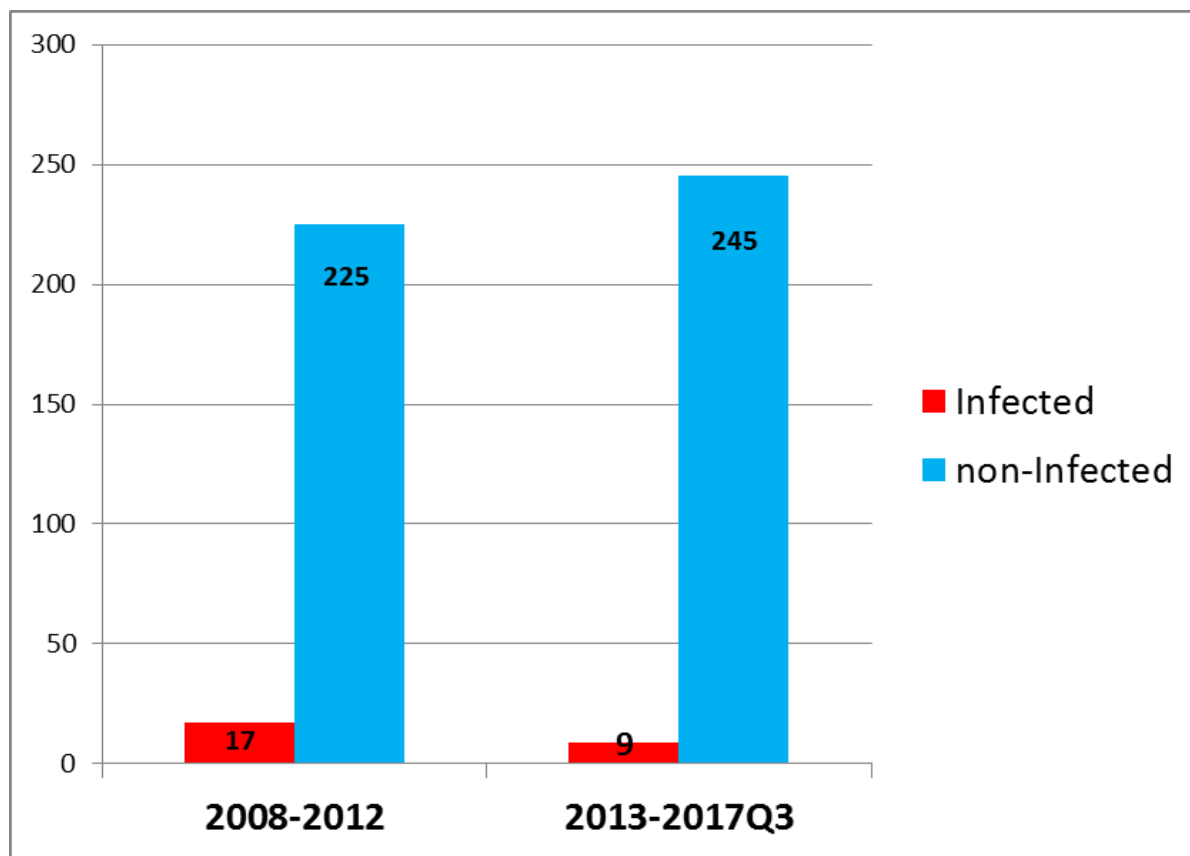


**VI. Surgical wound
dressed with Aquacel
Adhesive tape after
wound closure**

C. Post-operative Care

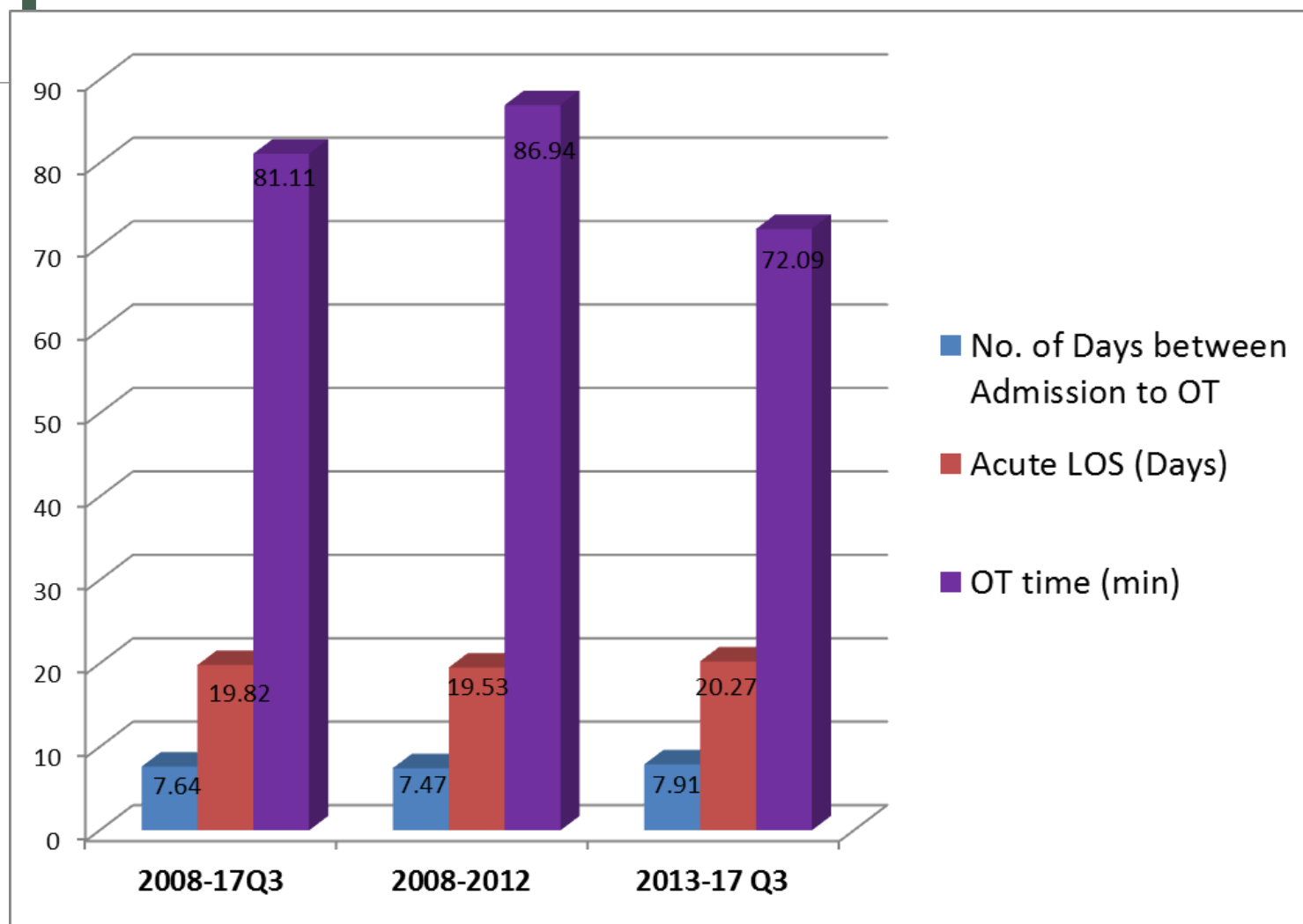
- **Dressing care:**
 - Change dressing immediately after soaked or contaminated
- **Wound Inspection Precautions:**
 - Surgical wound should NOT be left unattended for inspection.
 - Unnecessary wound inspection in early post-operative period should be avoided.

Total of 496 Hemiarthroplasties (2008-2017Q3)

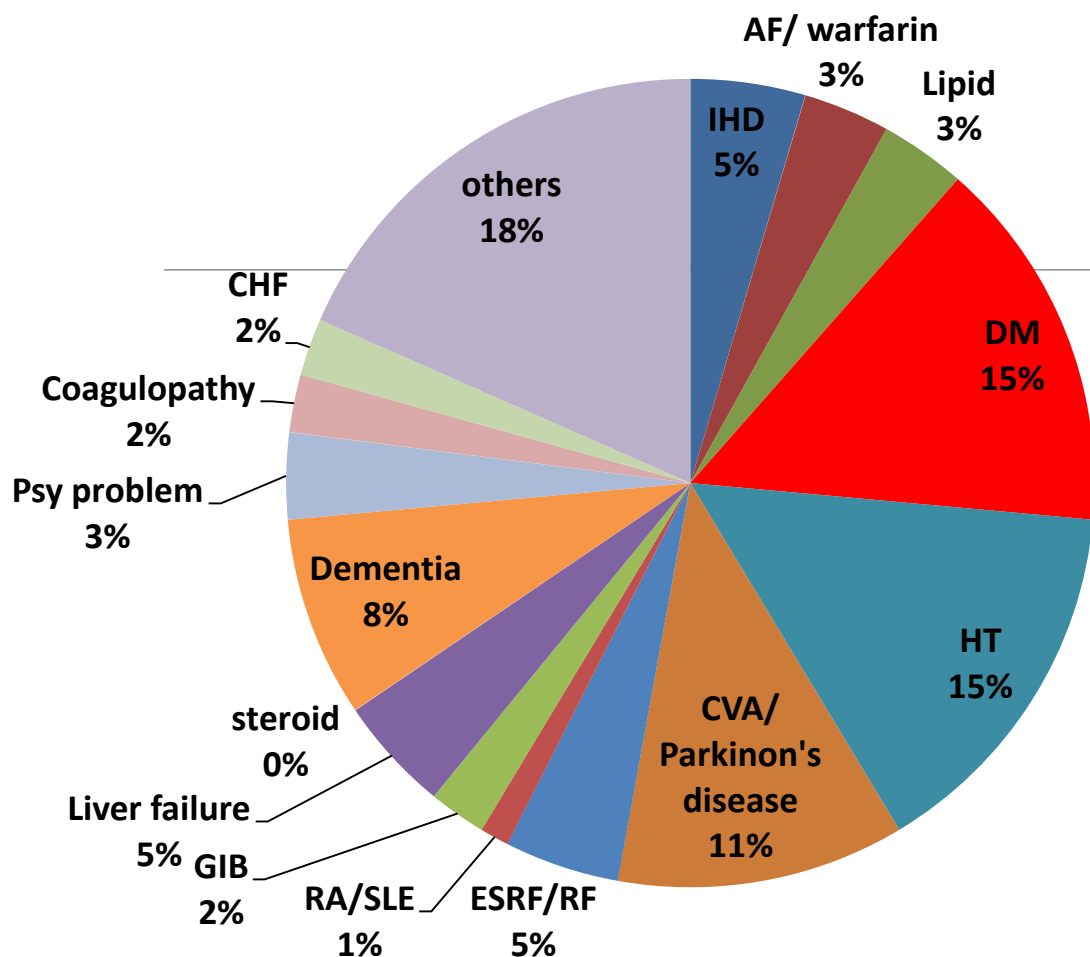


Chi-square test
 $p=0.082$

Operative Statistics

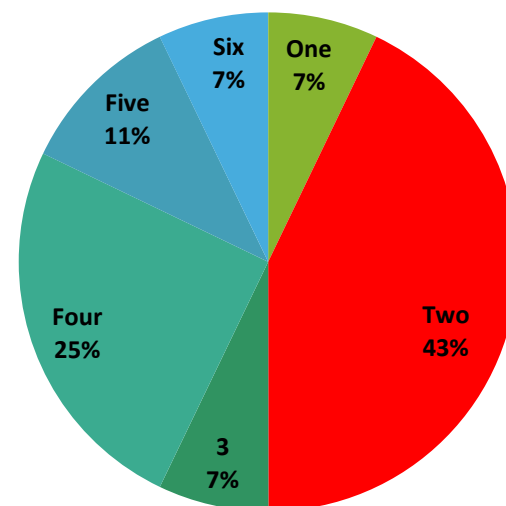


Medical Comorbidities 2008-2017

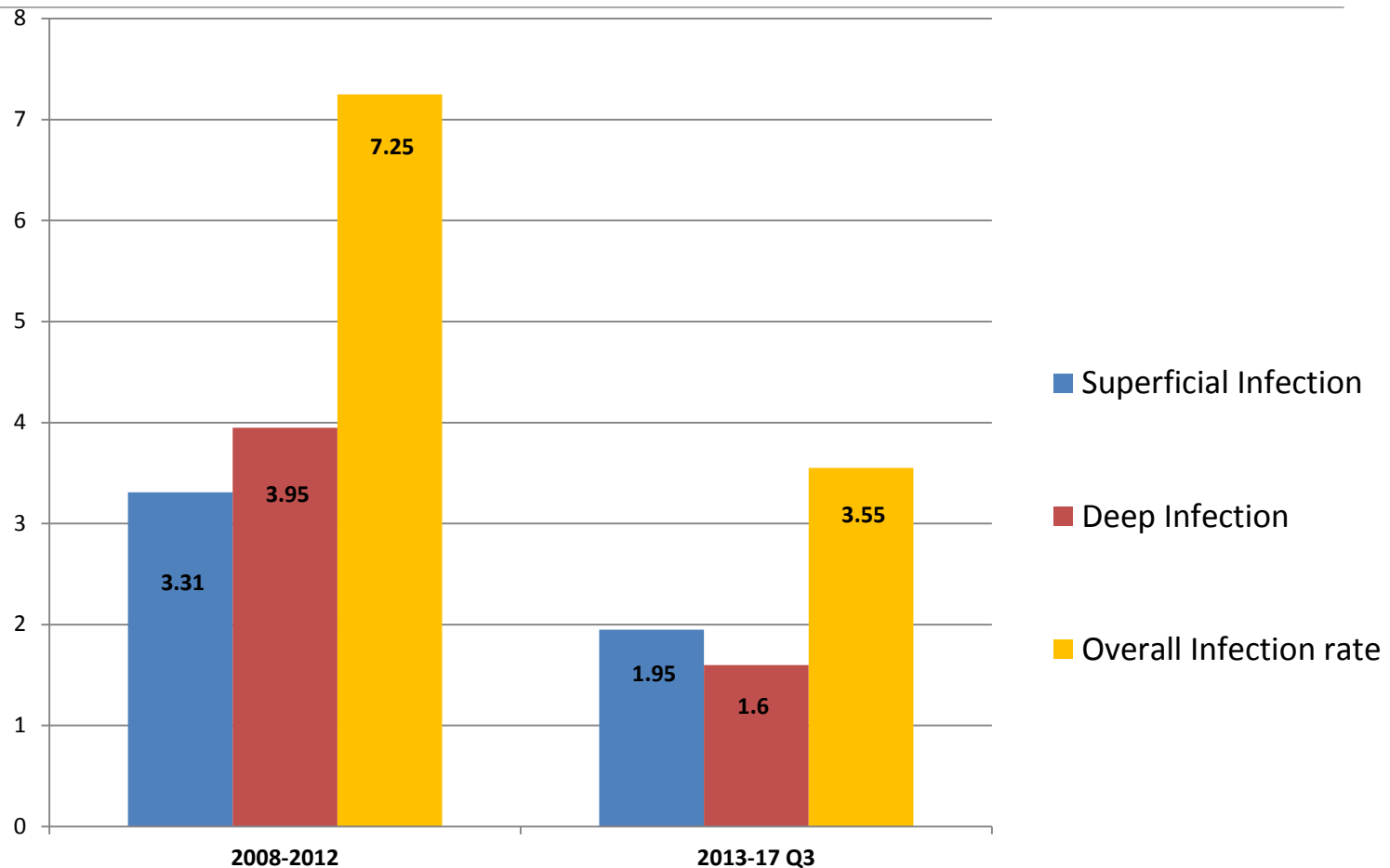


No. of comorbidities / patient	2008-17Q3	2008-2012	2013-17 Q3
1	2	1	1
2	12	7	5
3	2	2	0
4	7	5	2
5	3	1	2
6	2	1	1

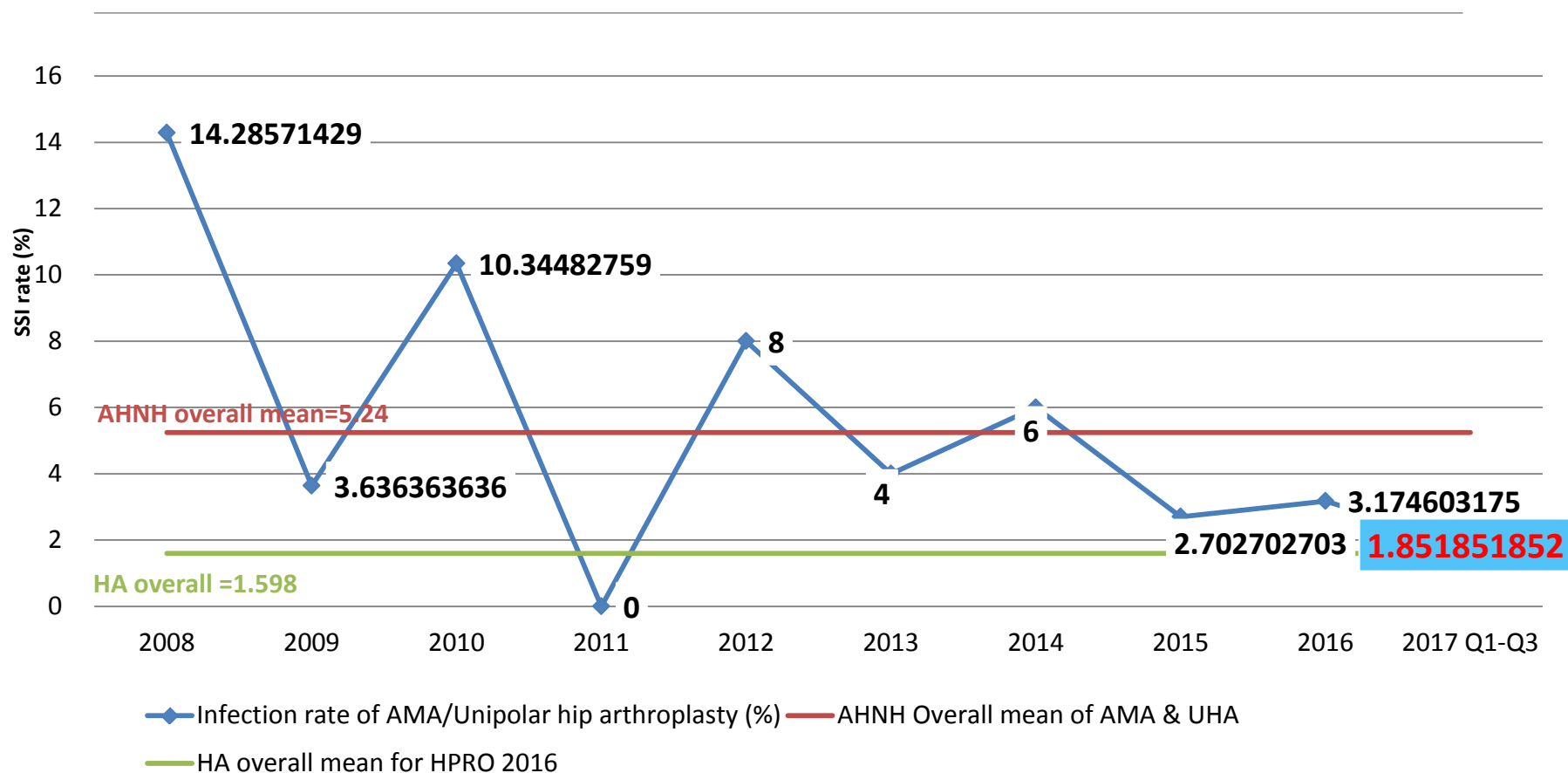
No. of comorbidities / patients 2008-2017



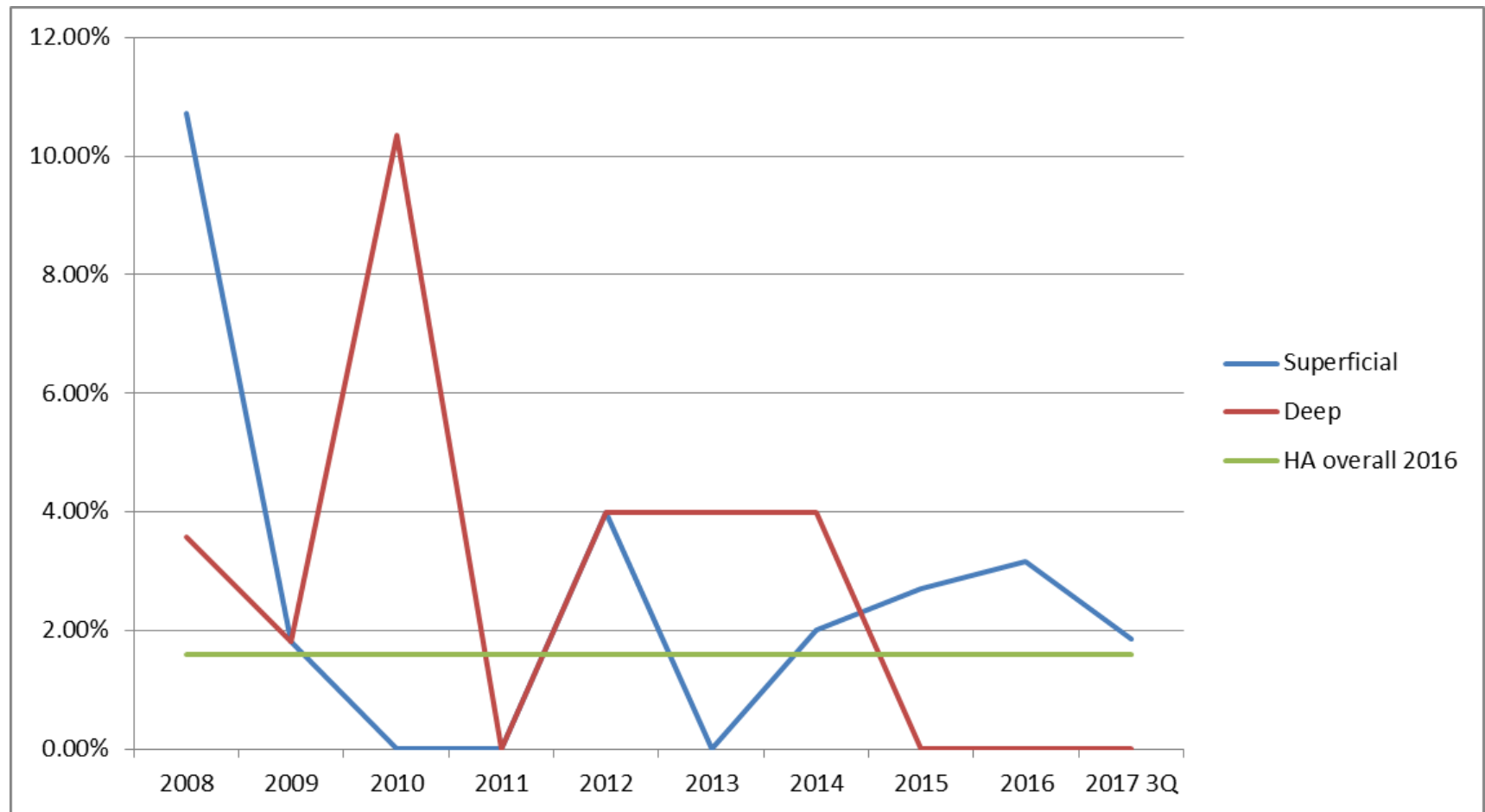
Average Yearly Infection Rate (%)



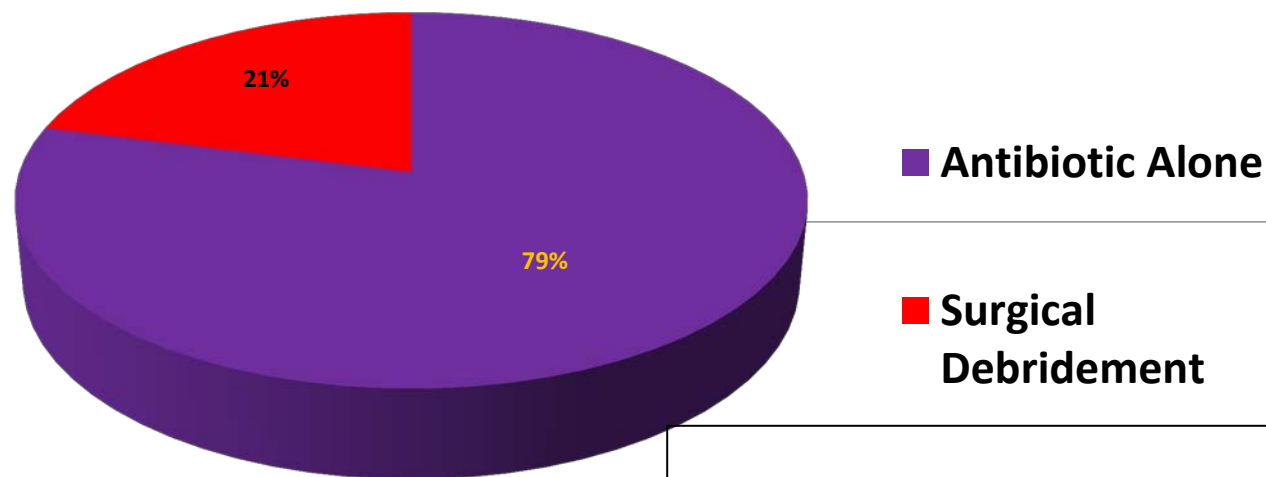
AHNNH Surgical Site Infection Surveillance (AMA & Unipolar Hip Arthroplasty) 2008 - 2017 Q3



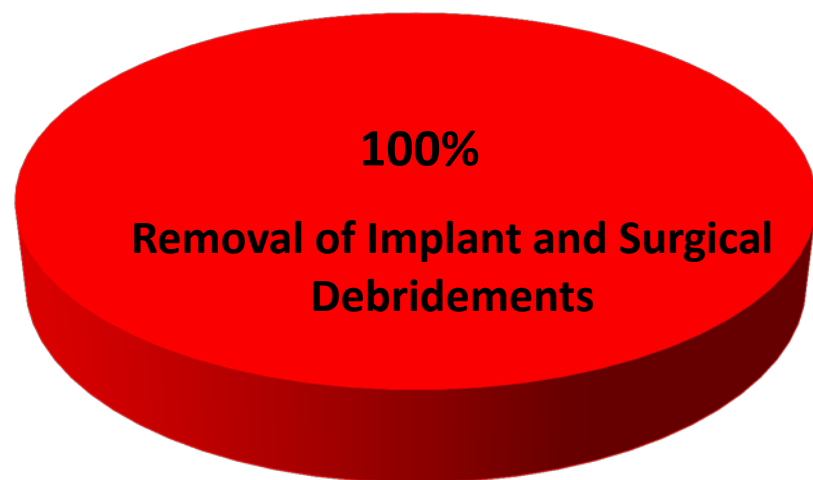
Yearly SSI for Hip fracture Hemiarthroplasty/ AMA



Treatment of Superficial Wound Infections

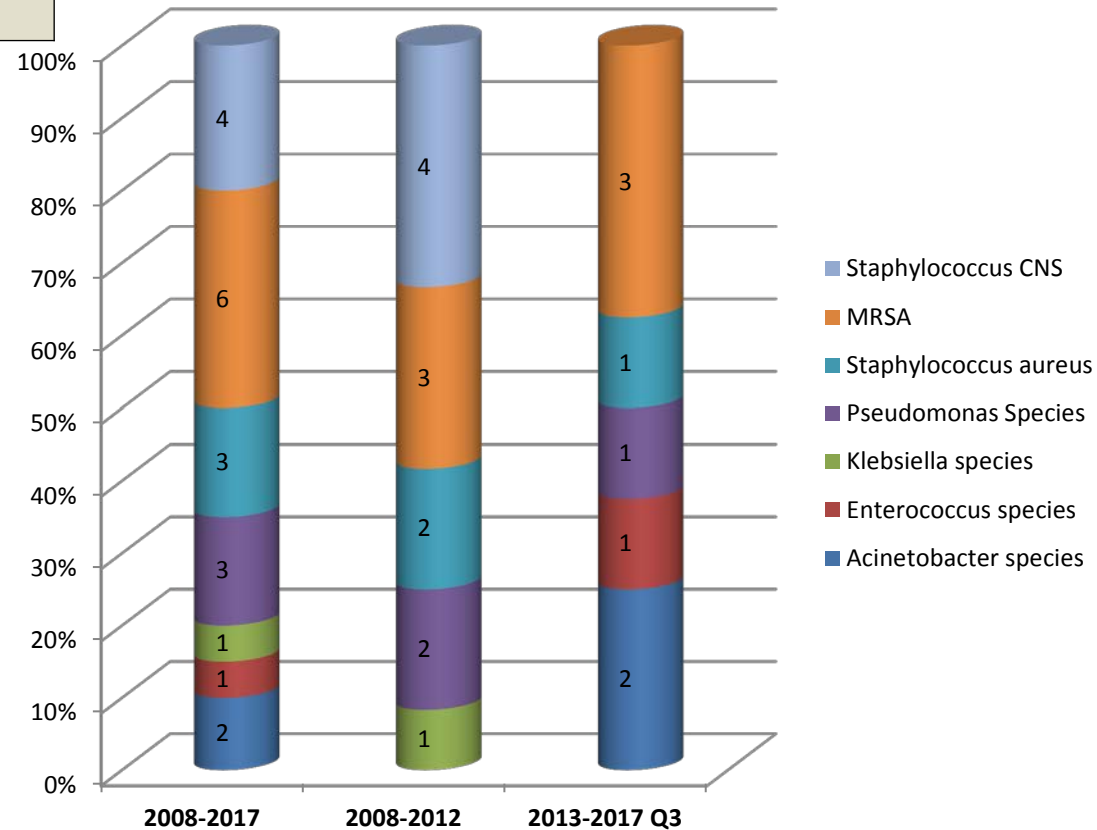


Treatment of Deep Wound Infections



Bacteriology of AMA/ Unipolar Hip Arthroplasty	2008- 2017	2008- 2012	2013- 2017 Q3
Acinetobacter species	2		2
Enterococcus species	1		1
Klebsiella species	1	1	
Pseudomonas Species	3	2	1
Staphylococcus aureus	3	2	1
MRSA	6	3	3
Staphylococcus CNS	4	4	

Bacteriology of AMA / Unipolar Hip Arthroplasty



Discussion

- The Bundle Approach cannot 100% eliminate SSI, **BUT....**
- *Decreasing* trend of **Overall SSI**
- *Decreasing* trend in *Deep wound infection* in *consecutive 2 years* since 2015

Conclusions

- The bundle approach has shown to achieve an effective and sustained decrease in SSIs in Hemiarthroplasty operations for geriatric hip fracture patients
- The result needs *shared efforts, mutual communications, support and understandings* of multidisciplinary teams

Reference:

1. Acklin YP, Widmer AF, Renner RM, Frei R, Gross T. Unexpectedly increased rate of surgical site infections following implant surgery for hip fractures: problem solution with the bundle approach. *Injury*. 2011 Feb;42(2):209-16.
2. Fairclough JA, Johnson D, Mackie I. The prevention of wound contamination by skin organisms by the pre-operative application of an iodophor impregnated plastic adhesive drape. *J Int Med Res*. 1986;14(2):105-9.
3. Andersson AE, Bergh I, Karlsson J, Eriksson BI, Nilsson K. The application of evidence-based measures to reduce surgical site infections during orthopedic surgery - report of a single-center experience in Sweden. *Patient Saf Surg*. 2012 Jun 14;6(1):11.
4. Katarincic JA, Fantry A, DePasse JM, Feller R. Local Modalities for Preventing Surgical Site Infections: An Evidence-based Review. *J Am Acad Orthop Surg*. 2018 Jan 1;26(1):14-25.

