

Reducing HAIs in a Staff-Constrained World

Addressing the Impact the Nose has on Infections

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Housekeeping

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Disclosures

Consultant: Emergency Care Research Institute (ECRI)

Consultant: Global Life Technologies Corp.

Consultant: Medical Illumination International Inc.

Learning Objectives

1. Explain the impact of COVID-19 on HAI rates
 2. Discuss the role of the nose/ colonization pressure in transmission and infections
 3. Describe how Active Source Control strategy can reduce colonization pressure and infections
 4. Describe ways to implement an Active Source Control program in today's environment
-

Microorganisms of the Nasal Vestibule

Most common microorganisms

Gram (+)

- *Corynebacterium spp.*
- *Propionibacterium spp.*
- *Streptococcus spp.*
- *Lactobacillus spp.*
- *Staphylococcus spp.*
 - ***Staphylococcus aureus***
 - **MRSA – Methicillin Resistant**
 - **MSSA – Methicillin Sensitive**
- *Staphylococcus Coagulase Negative*

Less common microorganisms

Gram (+)

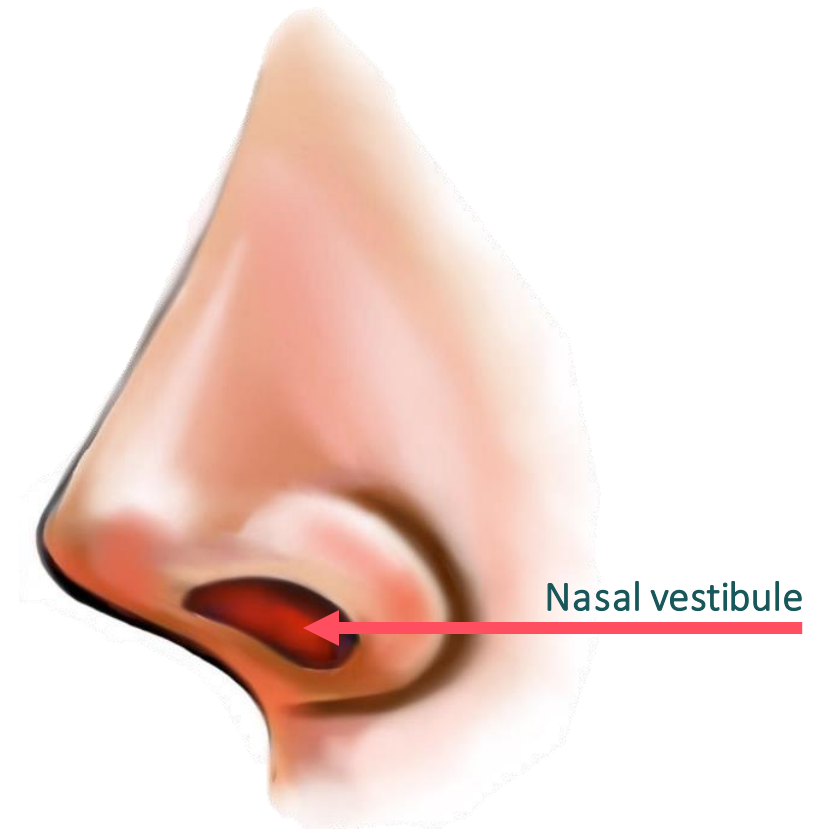
- *Enterococcus spp.*

Gram (-)

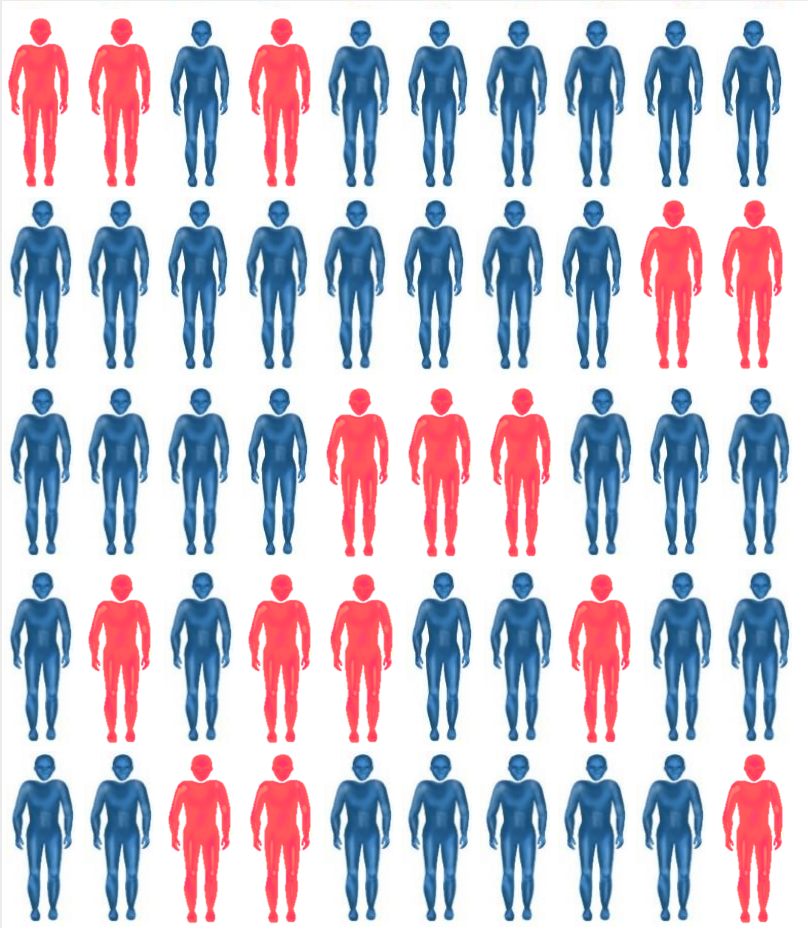
- *Enterobacteriaceae spp.*

Yeast

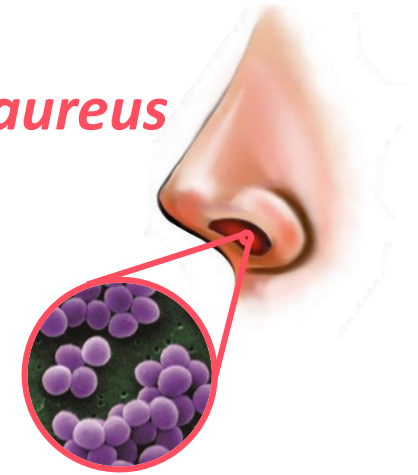
- *Candida spp.*



MRSA / MSSA Carriage Prevalence & the Role of the Nose



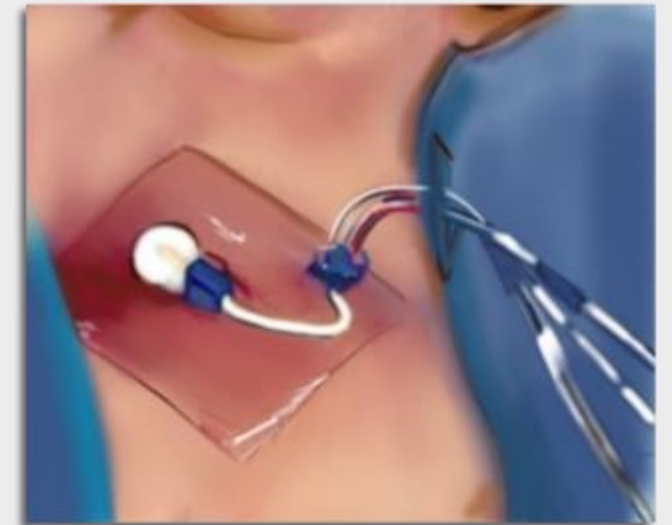
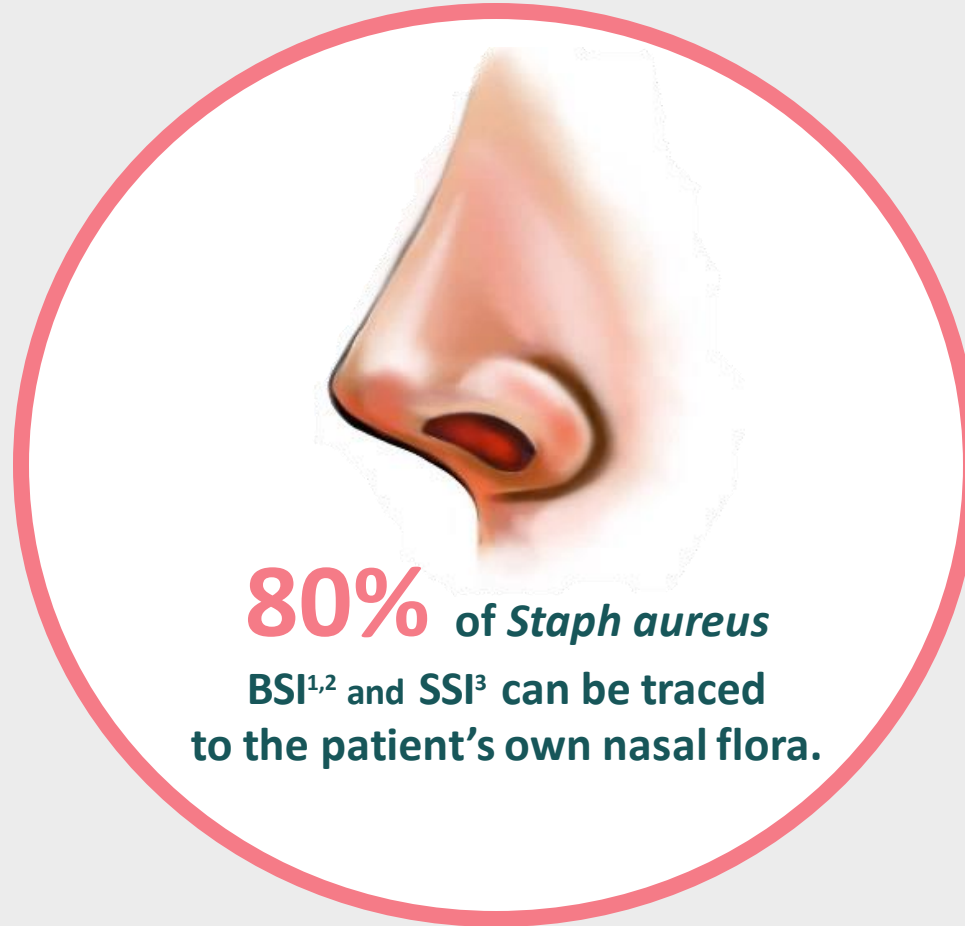
- **The main reservoir for *S. aureus* is the nasal vestibule¹**
- **30%** of the population are *S. aureus* nasal carriers³
- **~ 9 - 13%** of ICU admits are MRSA nasal carriers⁴
- **~ 5 - 8 % rate** of ICU admits acquire hospital MRSA carriage⁵
- **When the nose is decolonized**, there is a significant reduction in the number of *S. aureus* recovered from the skin⁶.



Role of *Staphylococcus aureus* in HAI



Staph aureus SSI



Staph aureus BSI

Nasal colonization is the main risk factor for infection^{1,2}

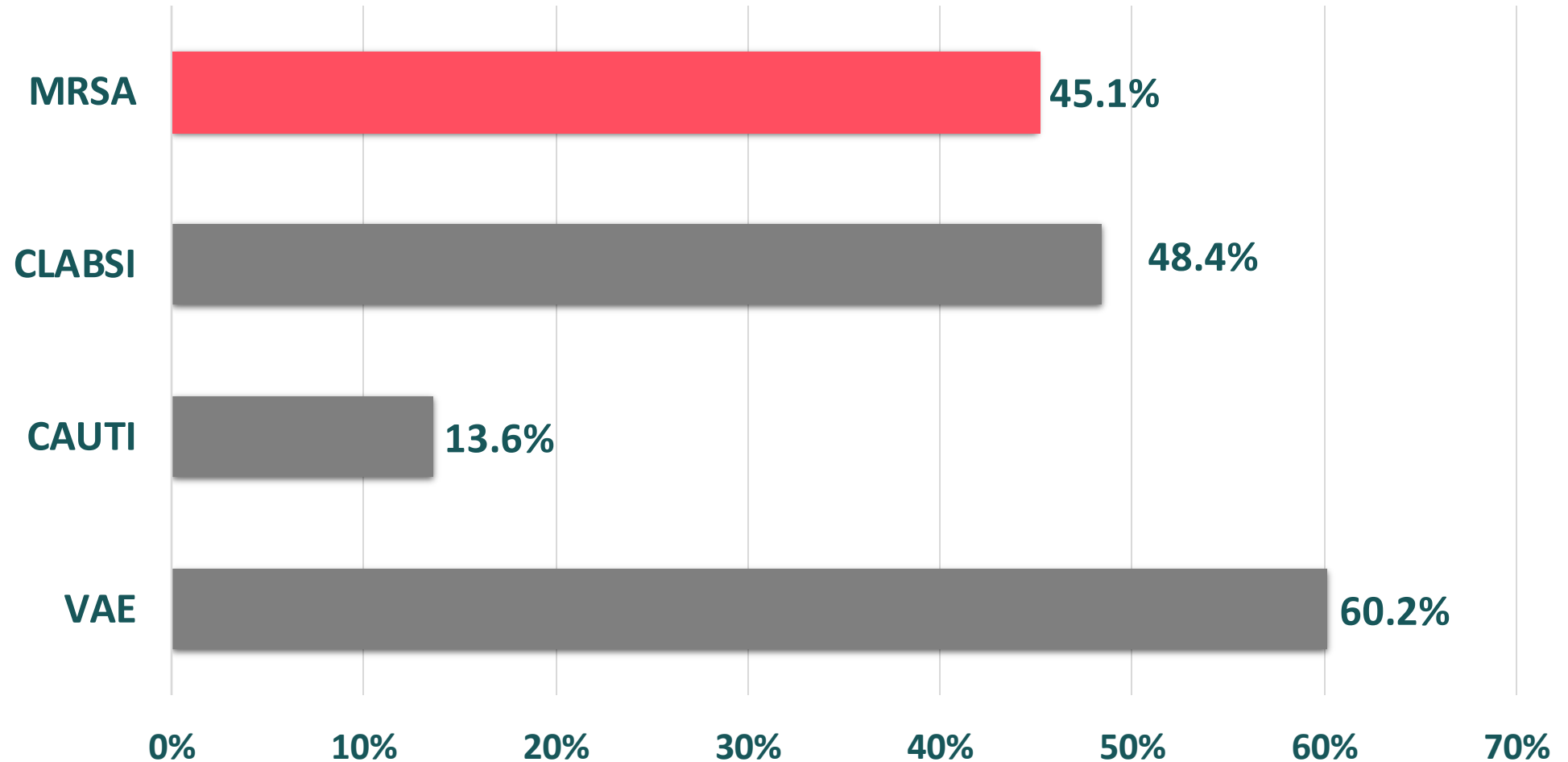
¹ Von Eiff, NEJM, Vol. 344, No. 1 · Jan 4, 2001

² Wertheim HF, Lancet 2004; 364: 703–05

³ Kalmeijer, ICHE 2000;21:319-323

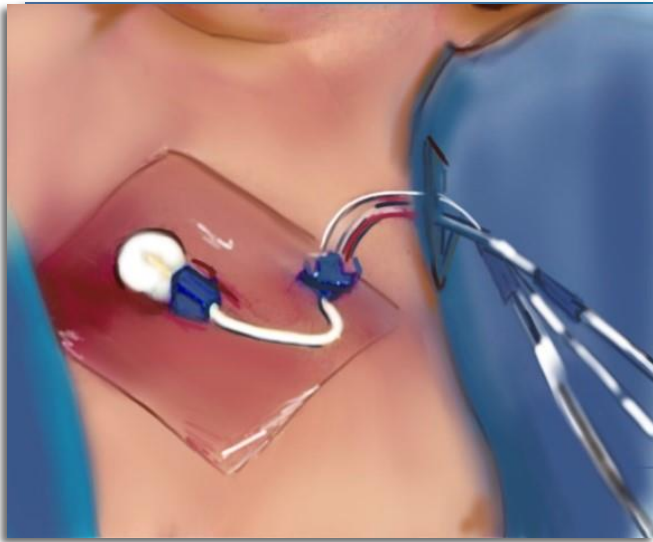
HAI Continues to Increase Dramatically in 2021

Increase in rate comparing Q3 2021 to Q3 2019 as reported to the NHSN



Role of *Staphylococcus aureus* in HAI

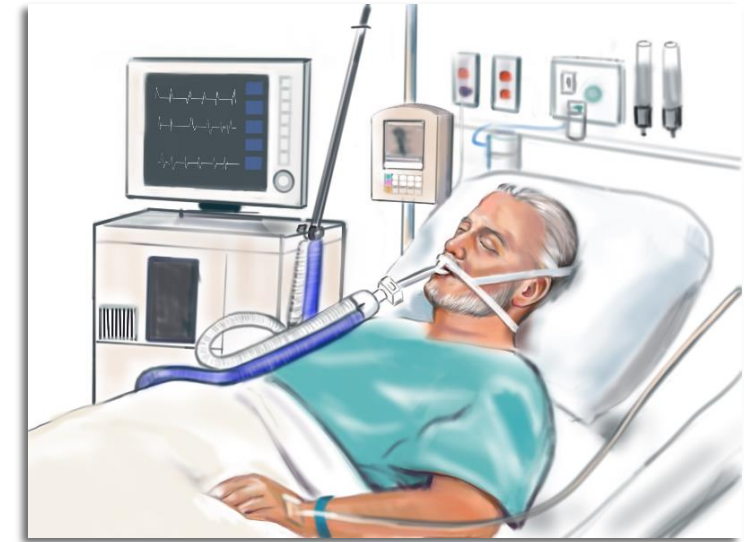
#1 CLABSI
Pathogen in
hospital wards¹



#1 SSI
Pathogen for all surgeries,
orthopedic, cardiac, ob-gyn¹



#1 PVAP
Pathogen in
ICUs¹

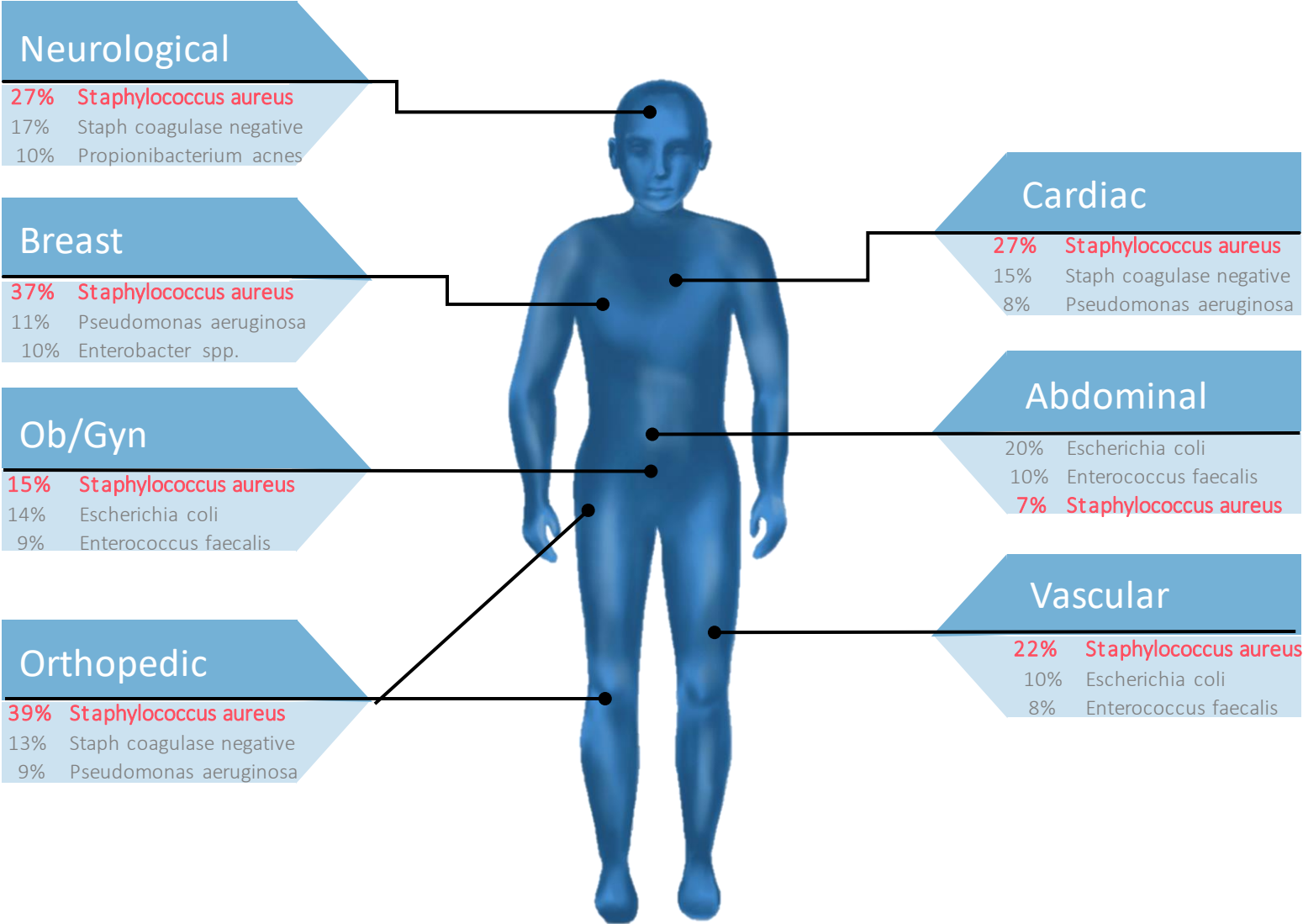


¹ Weiner-Lastinger L, et al. (2020). *ICHE*, 41:1-18.

² Ripa, *Antimicrob Agents Chemother* 2018 11 24;62(11).

³ Helm R. *Journal of Infusion Nursing*. May/June 2015: Vol 38, 3:190-203. 2.

Role of MRSA/MSSA in SSIs

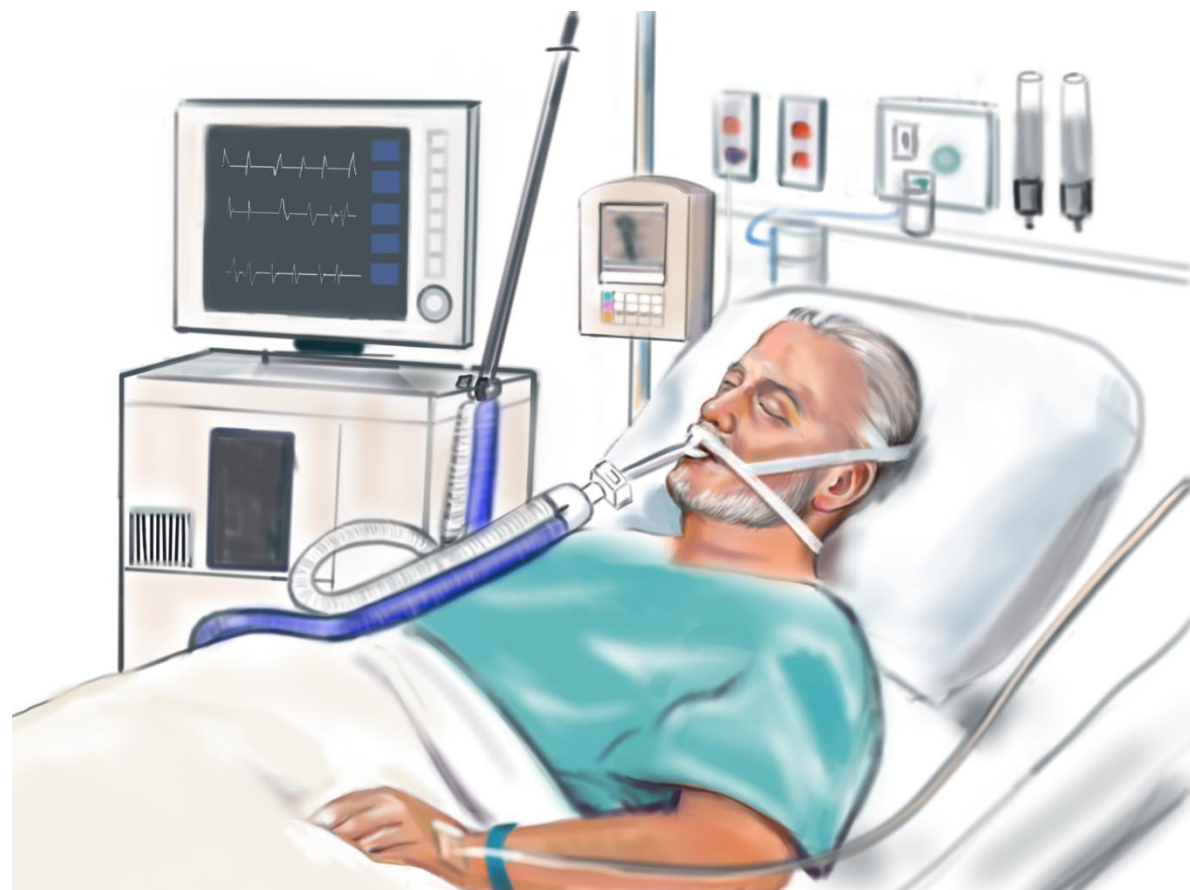


All Surgery Types
18% Staphylococcus aureus
 14% Escherichia coli
 8% Enterococcus faecalis

¹Weiner-Lastinger L, et al. (2020). Antimicrobial-Resistant Pathogens Associated With Healthcare-Associated Infections: Summary of Data Reported to the National Healthcare Safety Network, 2015–2017. *ICHE*, 41:1-18.

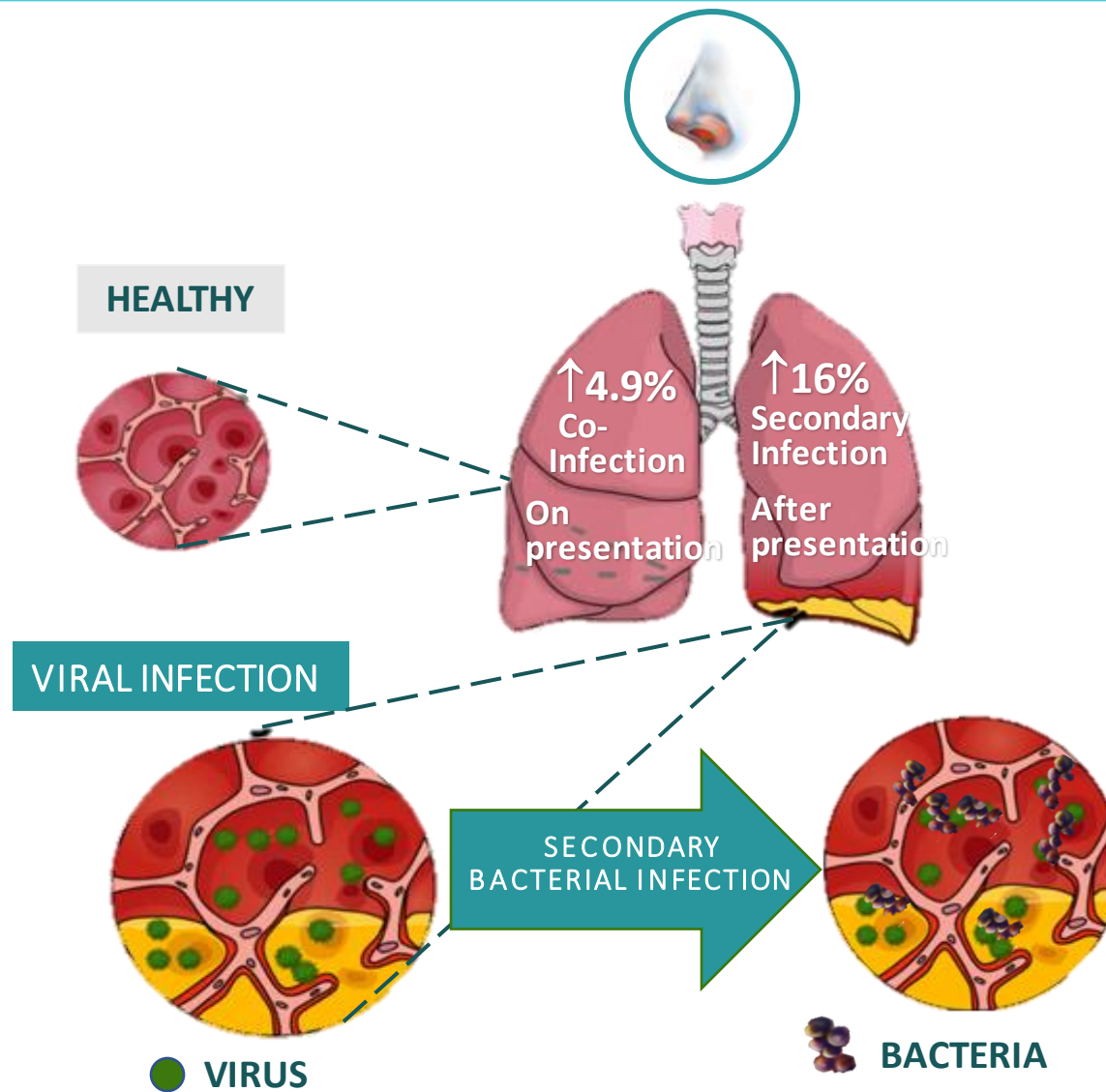
S. aureus Carriage - Role of the Nose

Most *S. aureus* strains from pneumonia and bronchitis are derived from the nasal cavity.



- **MRSA common cause of pneumonia, specifically necrotizing pneumonia (~30% mortality rate)¹**
- **In 94% of cases in one study, nasal and bronchial strains were genetically identical.²**

Secondary Bacterial Infection with COVID-19



- Most prevalent pathogens¹:
 - S. aureus* (> 57% MRSA)²
 - S. pneumoniae*
 - N. meningitidis*
 - H. influenzae*
 - K. pneumoniae*

Who is at Risk of MRSA/MSSA Nasal Colonization?

Risk Factors for MRSA/MSSA Nasal Colonization



Long Term Care



Prior Antibiotic Use



Geriatric Patients



Diabetic Patients



Previous Colonization



Alternative Housing



Previous *Staph* Infection



HIV Positive



Hemodialysis Patients



Immunocompromised Patients



Previous Hospitalization



Recent Incarceration

MRSA & MSSA Carriage & Infection

Risk of HO-MRSA Bacteremia

20X higher risk among MRSA carriers than non-carriers^{1,2}
29% mortality risk from a MRSA BSI⁴

Risk of HO-MSSA Bacteremia

3X higher risk among MSSA carriers than non-carriers³
24% mortality risk from a HO-MSSA BSI⁴

Methicillin Sensitive *Staphylococcus aureus* (MSSA)

MSSA Facts:

- **More prevalent than MRSA¹**
 - MSSA accounted for 59.7% of healthcare-associated *Staph aureus* cases
- **Mortality is higher than MRSA¹**
 - MSSA accounted for 60.1% of *Staph aureus* deaths
- **Not less costly to treat than MRSA²**

Other Pathogens:

- **All the top 10 causes of HAIs can be found in the nares**



Financial Burden

SSI INFECTION

Excess LOS days *

SSI:		MRSA SSI:
11		23

Cost to treat MRSA Infection*

SSI:		MRSA SSI:
\$20,785		\$42,300

CLABSI INFECTION

Excess LOS days *

CLABSI:		MRSA CLABSI:
10		16

Cost to treat MRSA Infection*

CLABSI:		MRSA CLABSI:
\$45,814		\$58,614

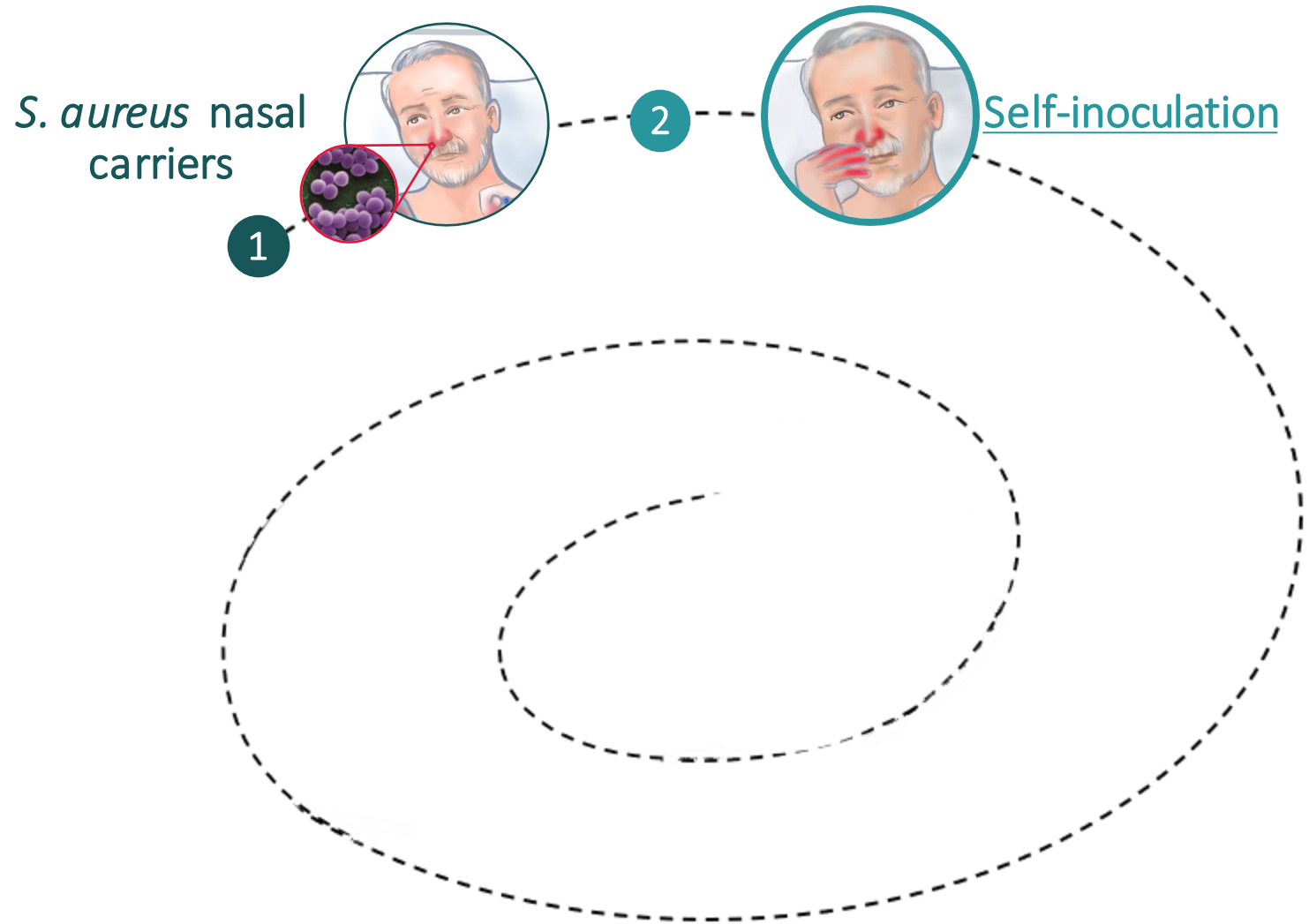
Staphylococcus aureus
Transmission



Revealing the Invisible World



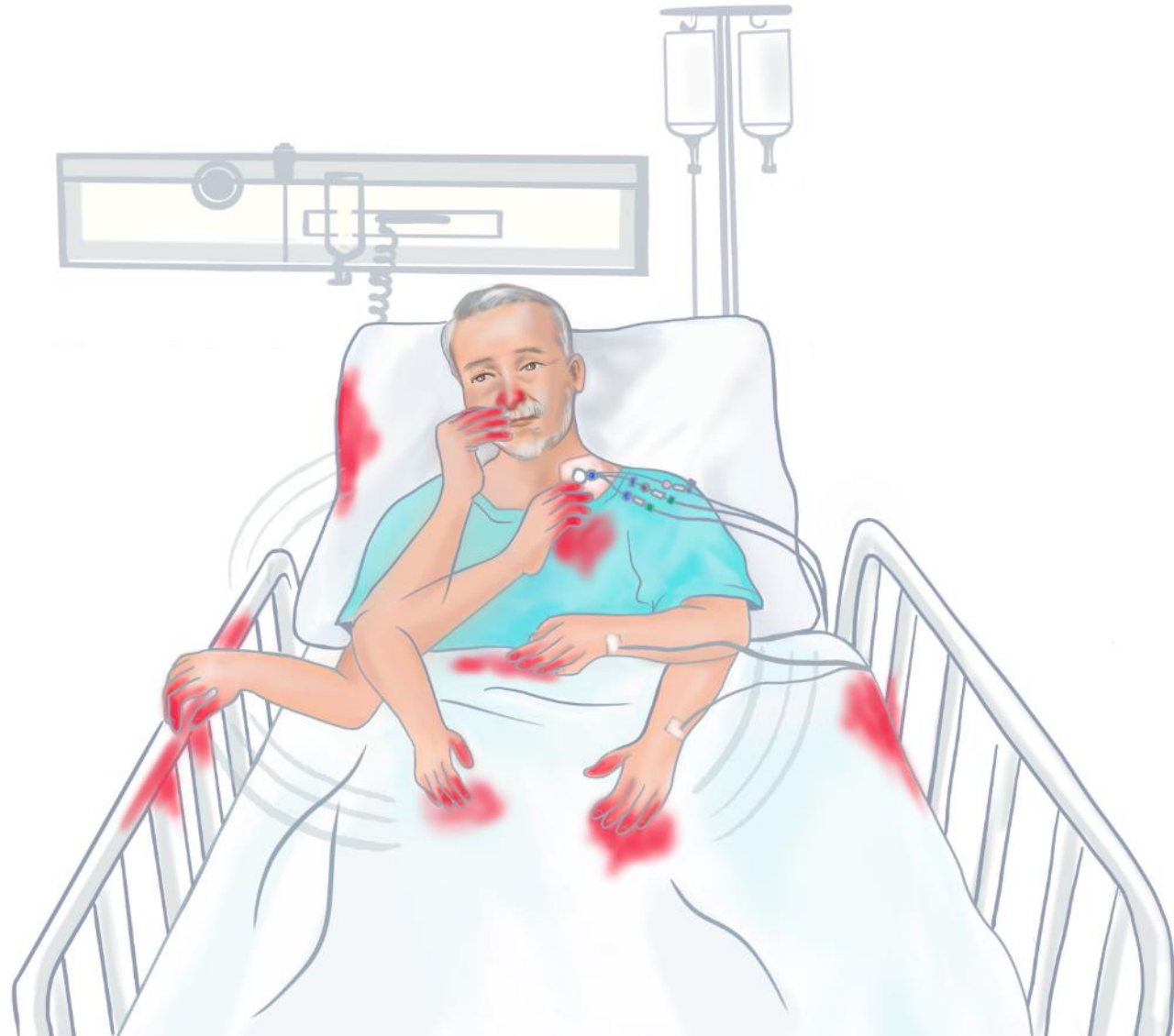
Staphylococcal Transmission Trail



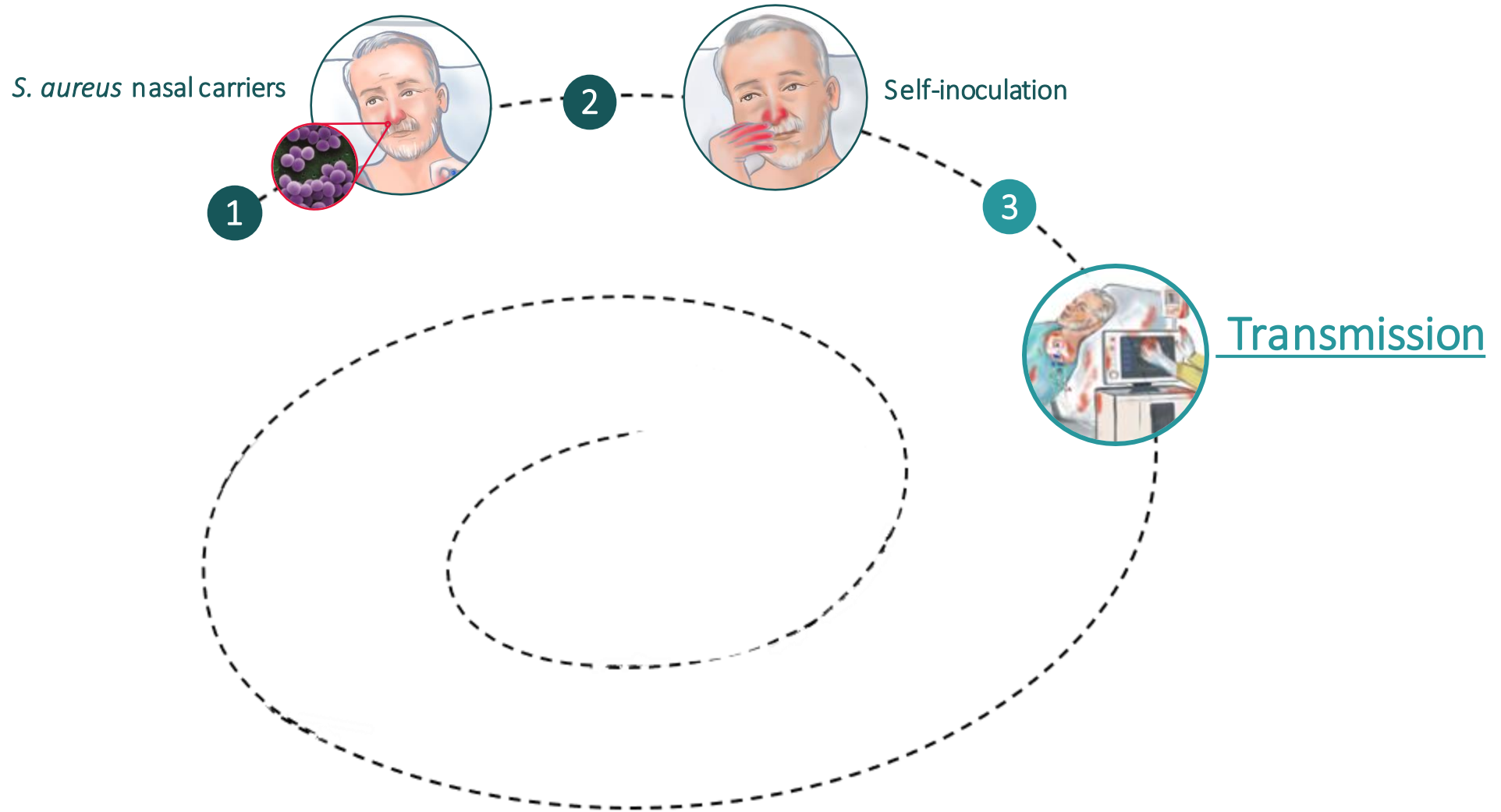
Self-inoculation

Endogenous Source Risk of Infection Spread from Nose to Portal of Entry

- **Portal of Entry:** Lines/Surgical Incision/Drains/Wounds/Indwelling Devices
- Nasal carriers are **7x** more likely to have contaminated hands¹
- We touch our nose over **100 times** a day!²



Staphylococcal Transmission Trail

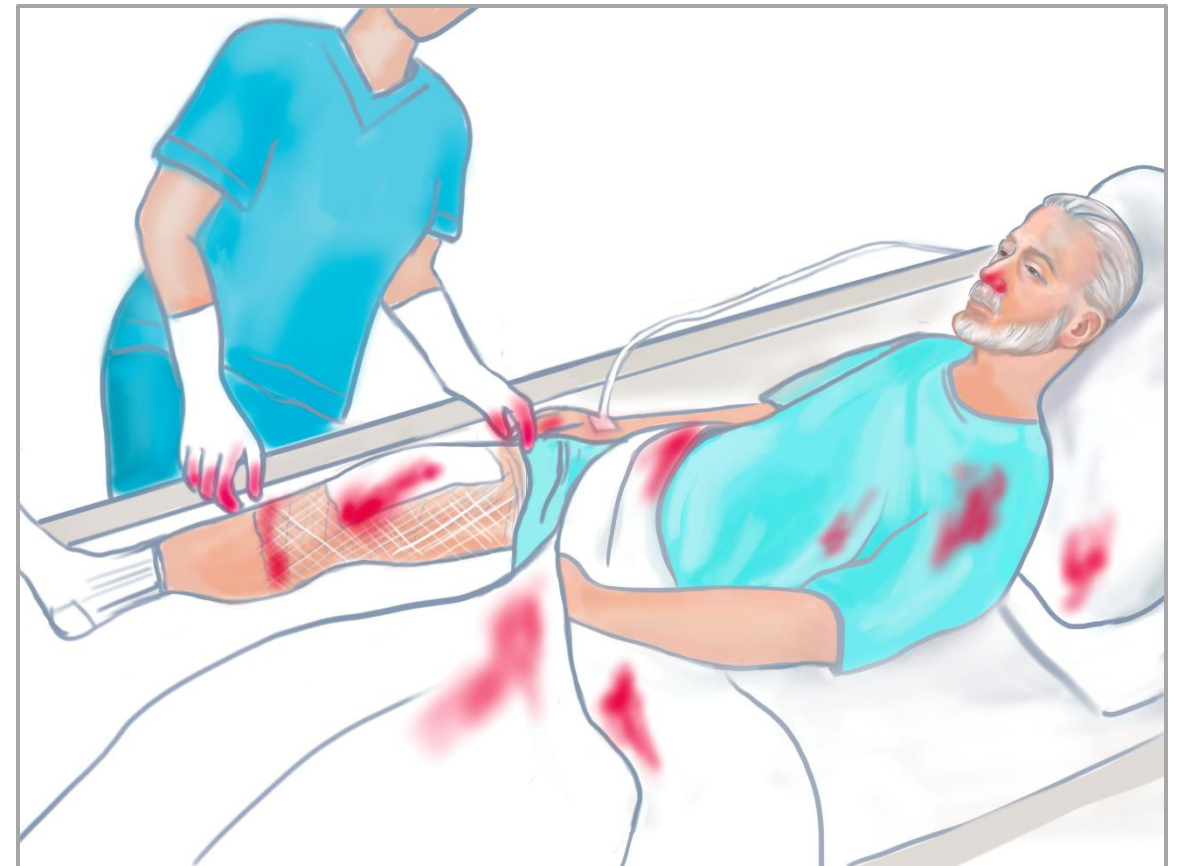


Transmission

Exogenous Source Risk of Infection

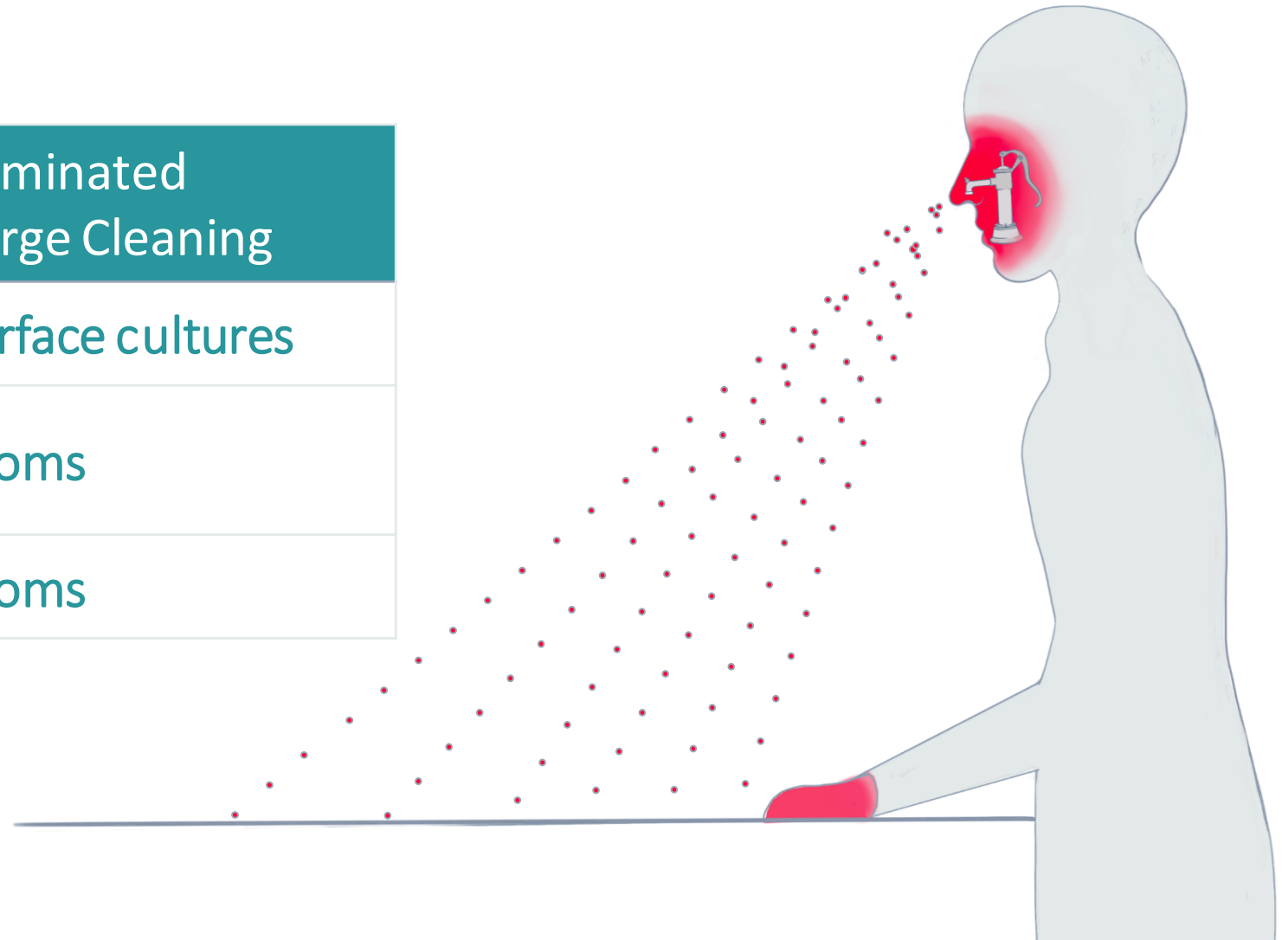
Spread from Nose to Environment, Hands, and to Other Patients

- Within a few hours the patient bedside environment becomes contaminated upon admission, and the whole room becomes contaminated within 24 hours.¹
- 39% increased risk of becoming colonized or infected with prior room occupancy of a patient colonized or infected with MRSA^{2,3,4,5}
- Colonized MRSA or VRE patient's rooms are contaminated more frequently than by infected patients (p=.033)⁶



The Thoroughness of Environmental Cleaning

Pathogen	% Contaminated after Discharge Cleaning
MRSA ¹	74% of surface cultures
MRSA ²	46% of rooms
MRSA ³	24% of rooms

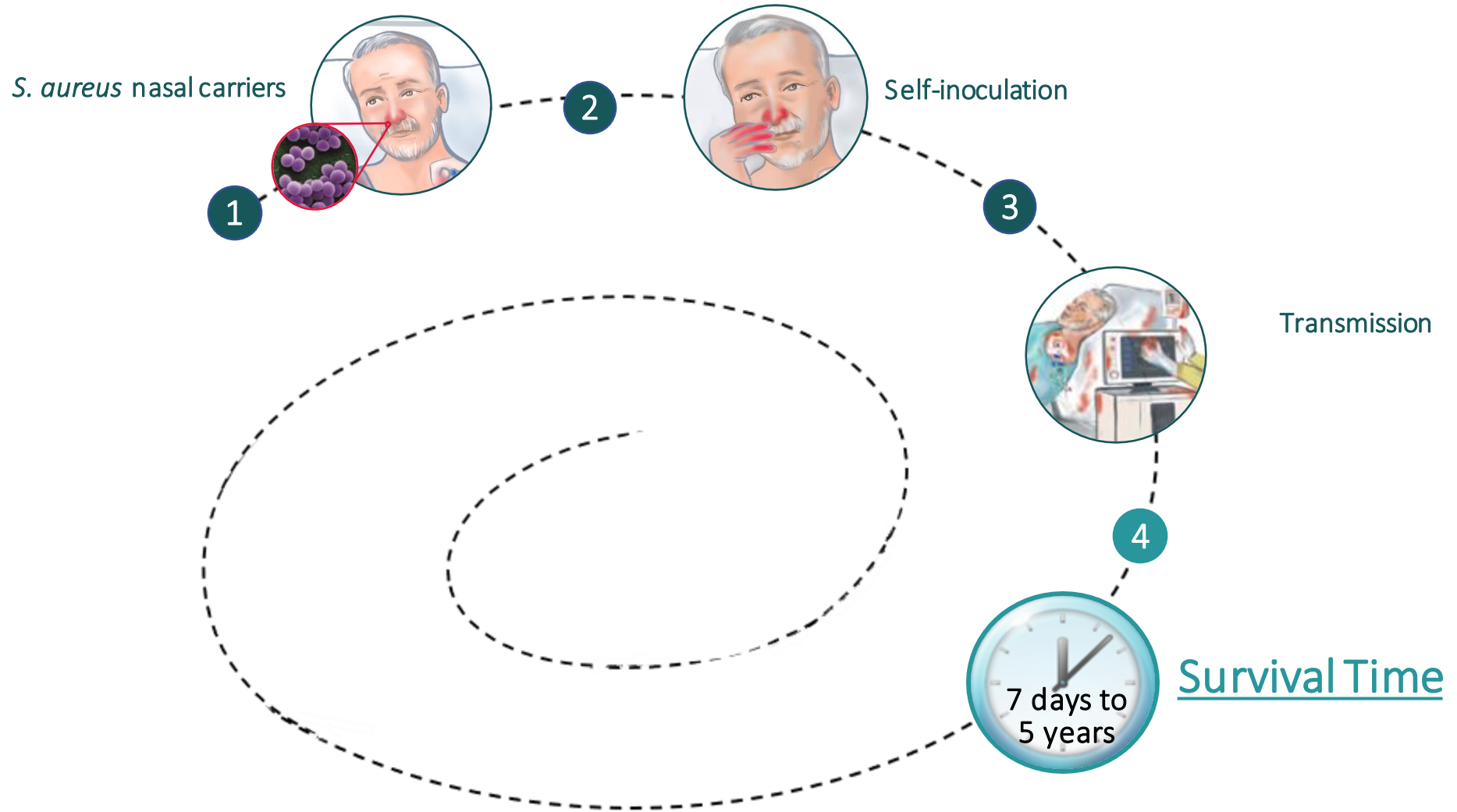


1 French, GL, *J Hosp Infect* 2004; 57:31–37


2 Blythe D, *J Hosp Infect.* 1998; 38: 67-70

3 Goodman ER, *ICHE.* 2008;29:593–9

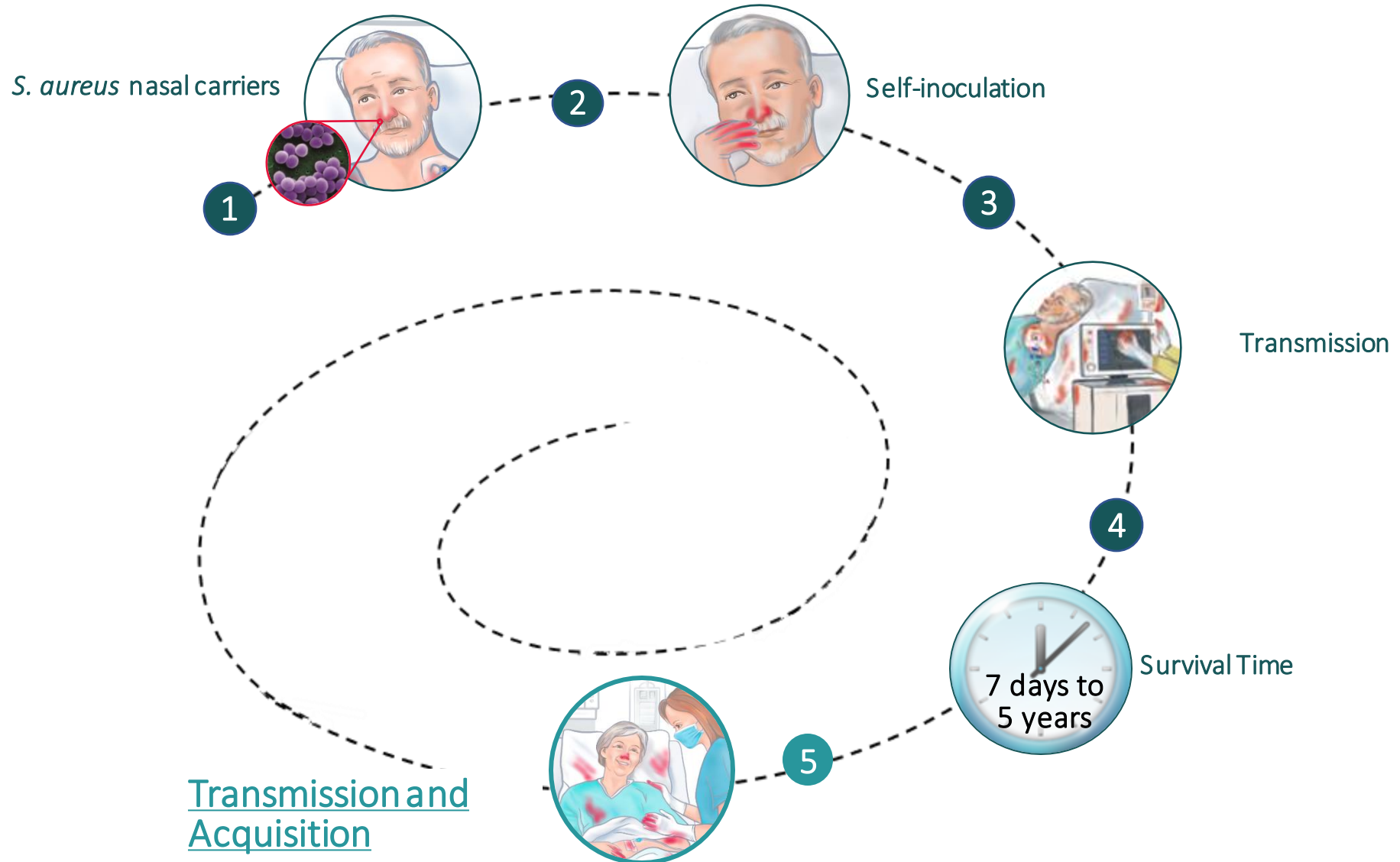
Staphylococcal Transmission Trail



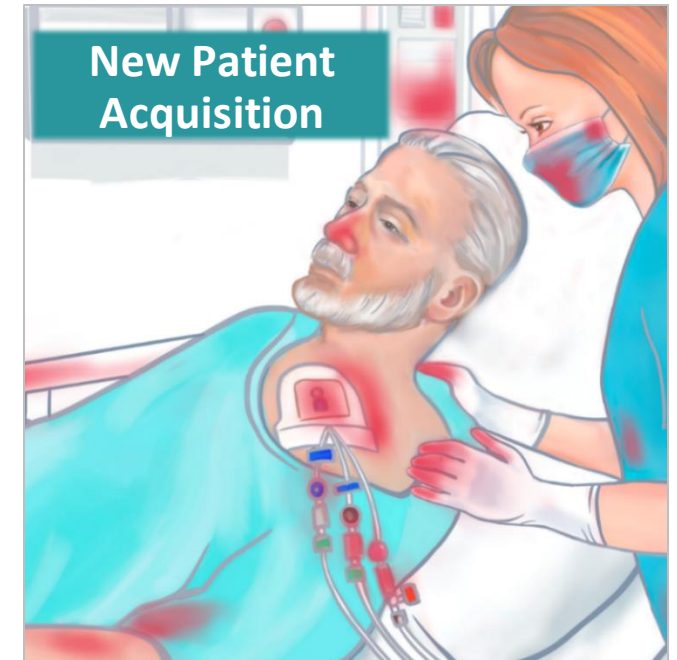
Survival Times of *Staphylococcus aureus* on Environmental Surfaces

Survival Times of <i>Staphylococcus aureus</i> on Environmental Surfaces			
Organisms	Types of environmental surfaces	Survival time	References
<i>Staphylococcus aureus</i> , including MRSA 	Dry inanimate surfaces	7 days to 5 years	[5, 7, 8, 37, 38]
	Cotton fabric, synthetic fibers, ceramic floor with the presence of blood	60 to 72 days	[39]
	Ceramic floor, cotton fabric synthetic fibers, eggcrate foam mattress (with/without biological fluids)	> 70 days	[9]
	Office paper	72 h to 7 days	[40]
<i>Staph aureus</i> , vancomycin-intermediate	Vinyl flooring and smooth surfaces	> 45 days	[41]

Staphylococcal Transmission Trail



Transmission - New Patient Acquisition



- **Transmission is responsible for 60+% of MRSA infections in the ICU and 40+% in non-ICU Units¹**
- **New acquisition of MRSA colonization increased the risk for subsequent MRSA infection, compared with no acquisition (RR, 12; 95% CI, 4.0-38).²**
- **15 - 25% of carriers develop MRSA infection during hospitalization or within 18 months³**

MRSA Nares Colonization at Hospital Admission and its Effect on Subsequent MRSA Infection

RESULTS:

MRSA INFECTION RISK

- 3.4% MRSA nasal carriage at admission
- 19% developed a MRSA infection
- MRSA colonization at admission increased the risk of subsequent MRSA infection, compared with no staphylococcal colonization (RR, 9.5; 95% CI, 3.6-25).

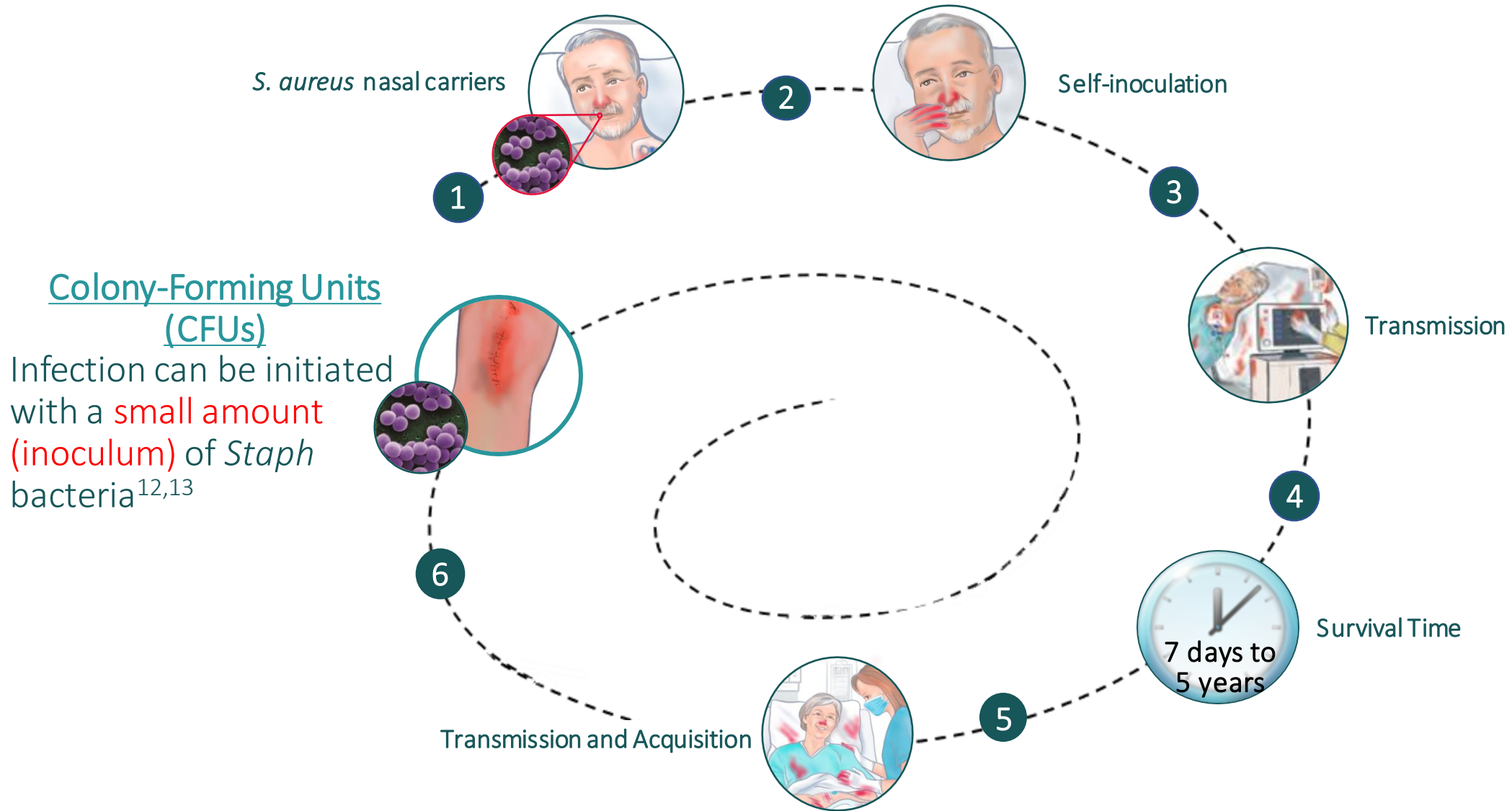
MRSA INFECTION RISK ON NEW ACQUISITION

- 25% of MRSA colonization acquirers developed an infection.
- New acquisition of MRSA colonization increased the risk for subsequent MRSA infection, compared with no acquisition (RR, 12; 95% CI, 4.0-38).

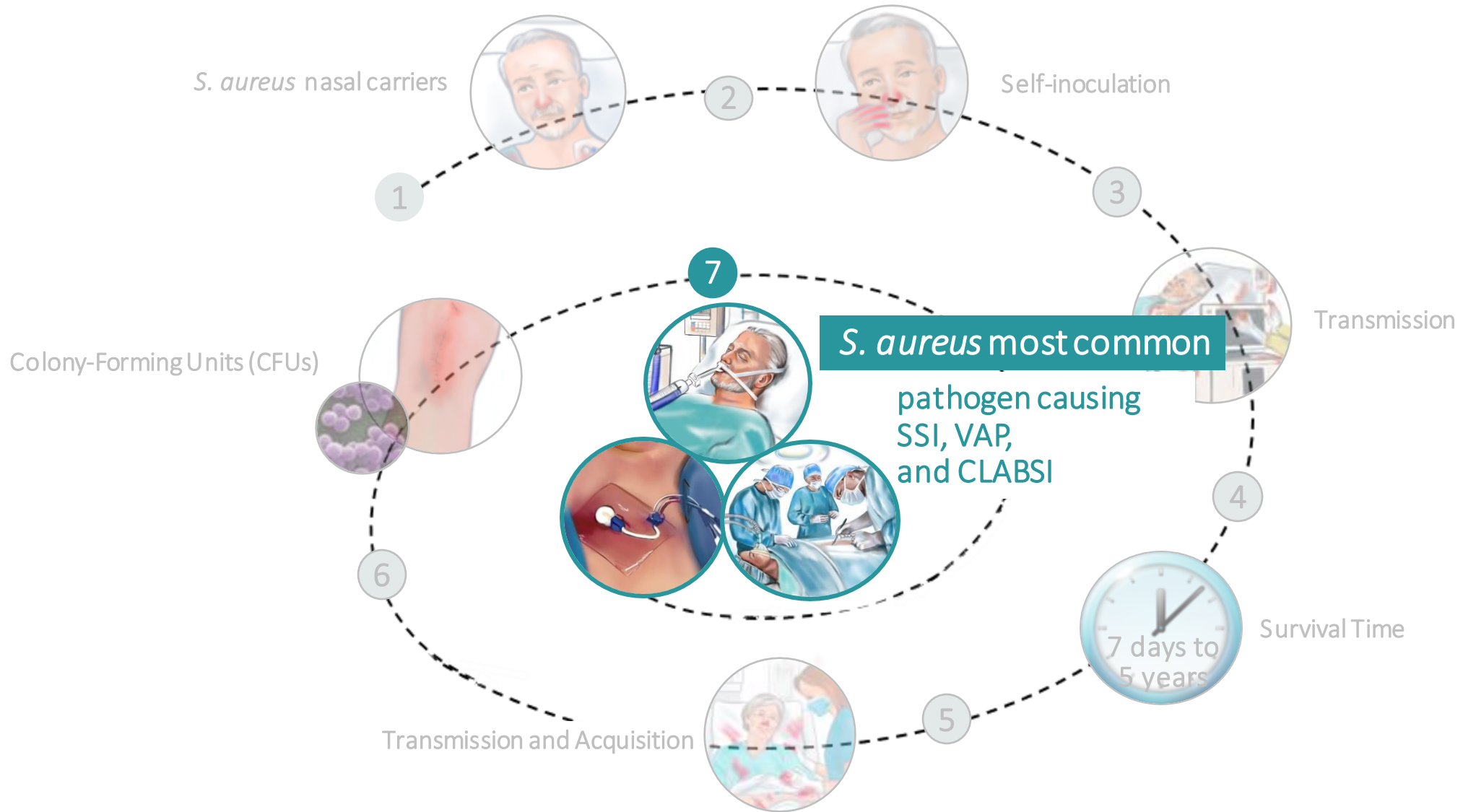
CONCLUSION:

- The relative risk of patients with hospital acquired MRSA colonization is higher than those who were colonized on admission.

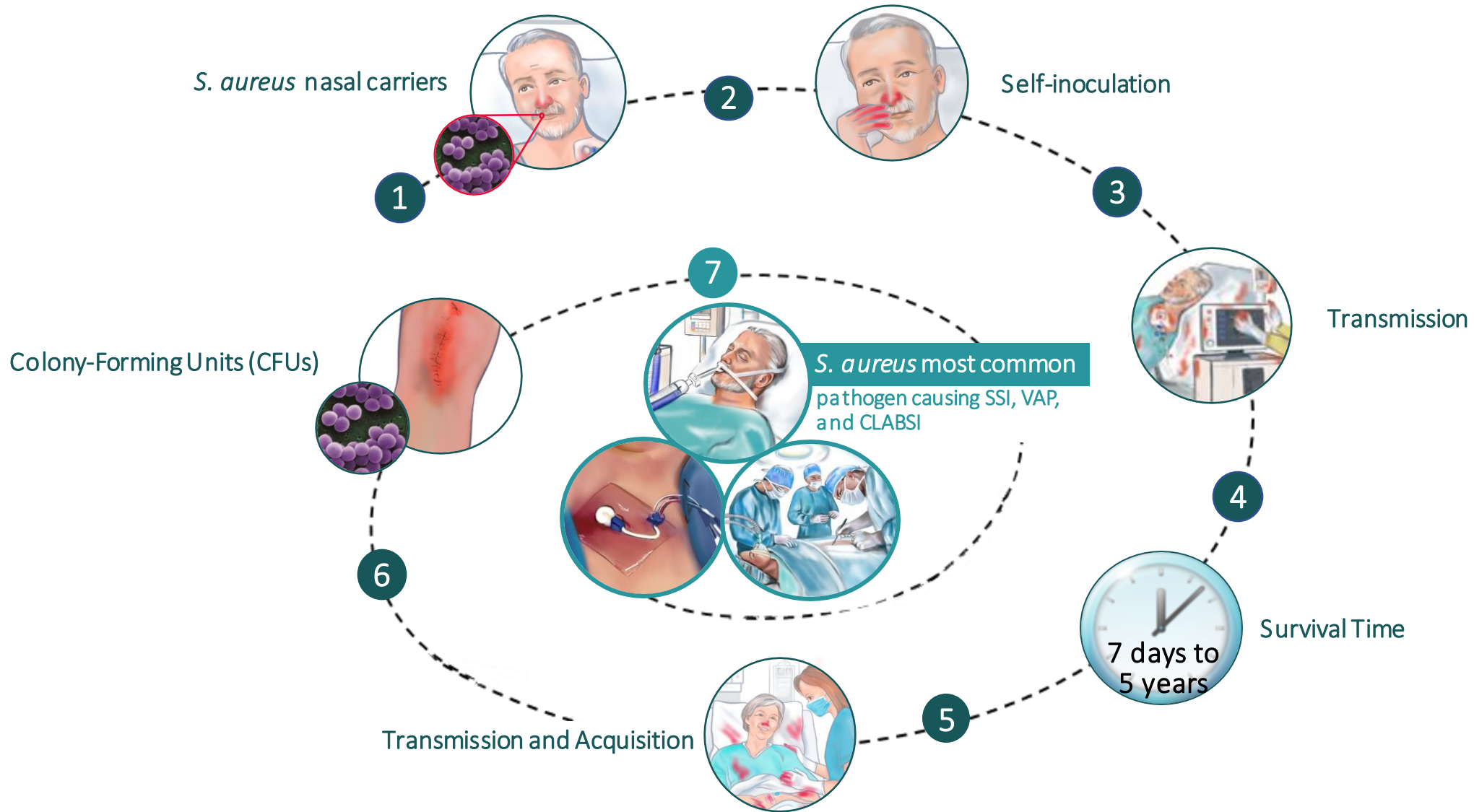
Staphylococcal Transmission Trail



Revealing the Invisible World

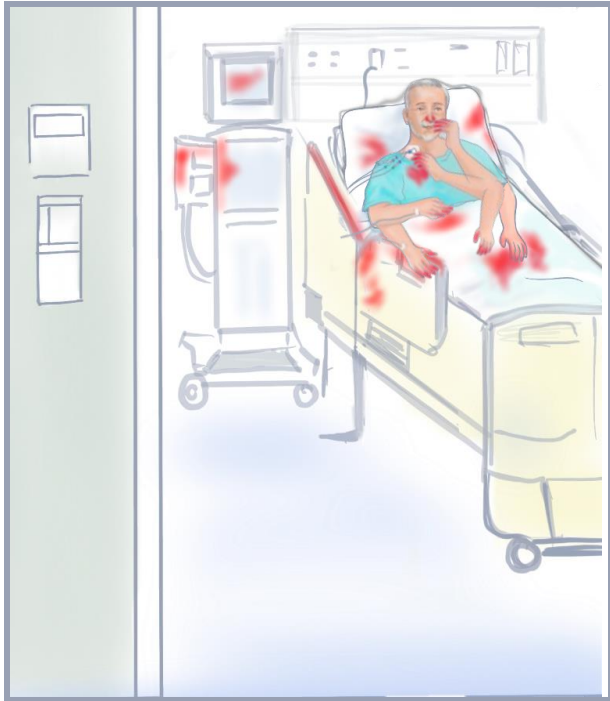


Staphylococcal Transmission Trail



Are these risks factors mitigated in your facility?

Self-inoculation



Transmission



SUCCESSFUL RISK MITIGATION PROGRAMS NEED TO ADDRESS

Self-inoculation/Transmission infection risk simultaneously

Past and Current Strategies

Isolation Precautions

Standard Precautions

Screen and Treat

Screen and Isolate

Universal Nasal Decolonization

History of *Staph aureus* & Nasal Colonization Risk Mitigation Strategies

Methicillin Developed



ISOLATION PRECAUTIONS MRSA(+)



STANDARD PRECAUTIONS



SCREEN & TREAT HIGH-RISK SURGERIES



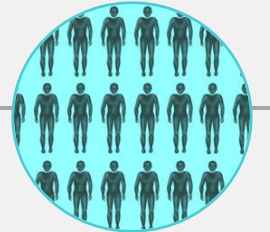
SCREEN & TREAT/ISOLATE HIGH-RISK PATIENTS



Universal Nasal Decolonization Antibiotic All ICU Patients

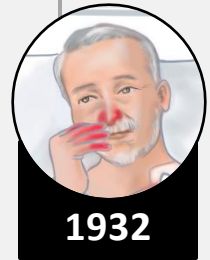


Universal Daily Nasal Decolonization Antiseptic ALL INPATIENTS



2014 New Paradigm – UNIVERSAL ALL PATIENTS - Active Source Control

1st MRSA USA Hospital Outbreak 1968



Auto-Infection

1932

The Nose
The main source of transmission and infection risk is partially addressed

The Nose
The main source of transmission and infection risk is NOT addressed

The Nose
The main source of transmission and infection risk is partially addressed

The Nose
The main source of transmission and infection risk is partially addressed

LIMITATIONS ANTIBIOTIC

- Administration
- Resistance
- Delay in days to nasal decolonize
- Self-inoculation and Transmission risk

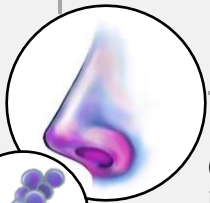
BENEFITS

- Addresses the nose, the main source of transmission and infection risk upon application.
- Broad-spectrum activity
- No resistance

***S. aureus* discovered in the nose 1889**



Dr. Semmelweis Antiseptic solution to wash hands 1847



History of *Staph aureus* & Nasal Colonization Risk Mitigation Strategies

Screen and Isolate (S&I)

- For Detected MRSA (+)



•The Nose, the main source of transmission and infection risk is partially addressed

Screen and Treat

- Screen High-Risk Patients
- Screen High-Risk Surgeries
- Treat Detected MRSA (+) and/or Isolate



•The Nose, the main source of transmission and infection risk is partially addressed

Standard Precautions

- Follow Standard Precautions for all patients



•The Nose, the main source of transmission and infection risk is not addressed

Universal Nasal Decolonization

- ACTIVE SOURCE CONTROL



BENEFITS

- Addresses the nose, the main source of transmission and infection risk

Reduce MRSA Study

REDUCE MRSA Study:

- 43 hospitals, 74 ICUs, 16 states
- ~75,000 patients, 283,000 ICU patient days
- 18-month intervention (Apr 2010 – Sep 2011)

Arm 1: SCREEN AND ISOLATE

- Screened all ICU patients and isolate **known MRSA (+)**

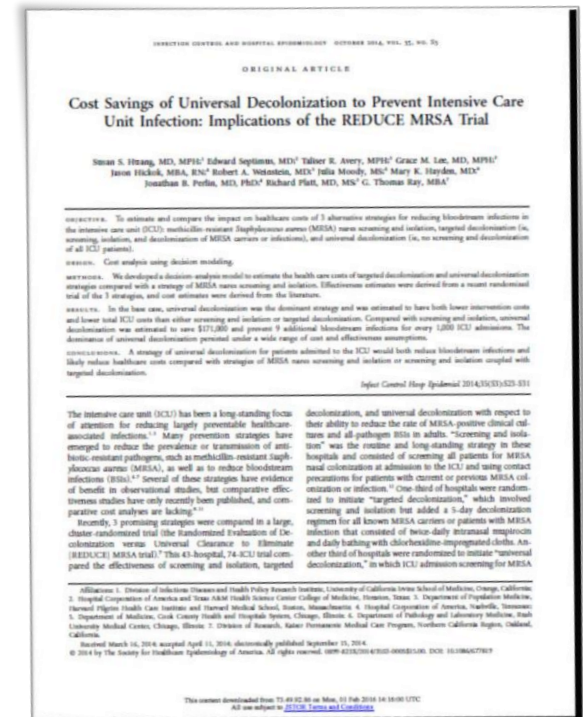
Arm 2: TARGETED DECOLONIZATION

- Screened all ICU patients
- Targeted nasal decolonization/CHG bathing only for **known MRSA (+)**

Arm 3: UNIVERSAL DECOLONIZATION

- No screening
- Universal nasal decolonization/CHG bathing for all ICU patients

44% DECREASE IN ALL-CAUSE BLOODSTREAM INFECTIONS



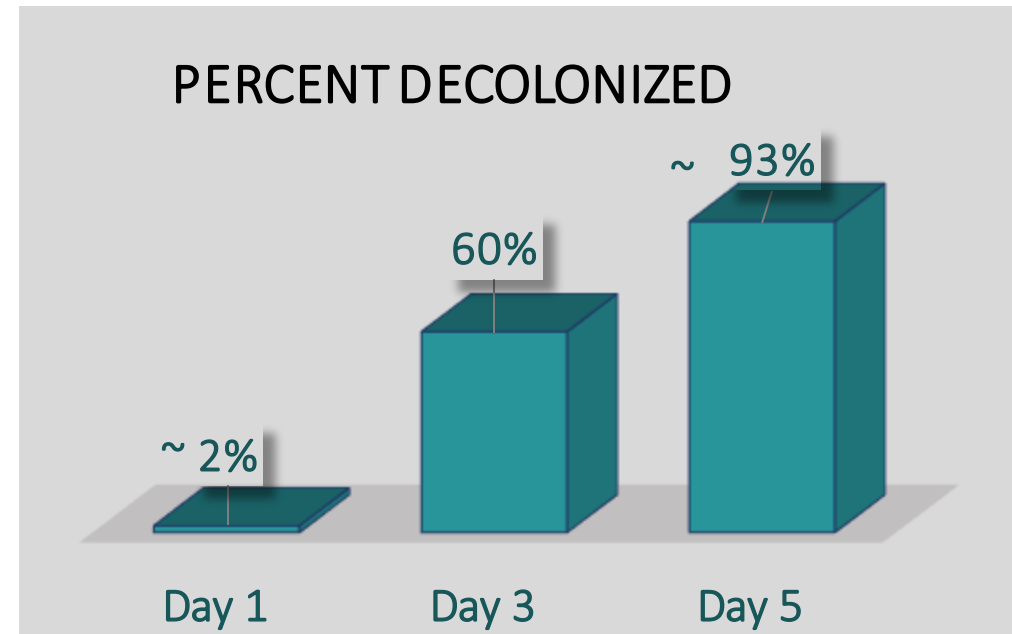
Huang SS et al. NEJM
2013; 368 (24):2255-65

Limitations of Mupirocin vs. an Antiseptic Solution

Antibiotic - Mupirocin (Bactroban®)

Limitations to consider:

- Does not comport with **antibiotic stewardship***
- **Selective** mechanism action against gram + bacteria only
- **5-day** BID course – limited effectiveness until day 3 of treatment*
- **60% - 93% effective***
- **Resistance** concerns as high as 31% reported**
- **Transfer of resistance** to *S. aureus* and CoNS***
- **Treatment failure*** with eradication rate as low as 51%
- **Local hypersensitivity** reactions with mupirocin*****



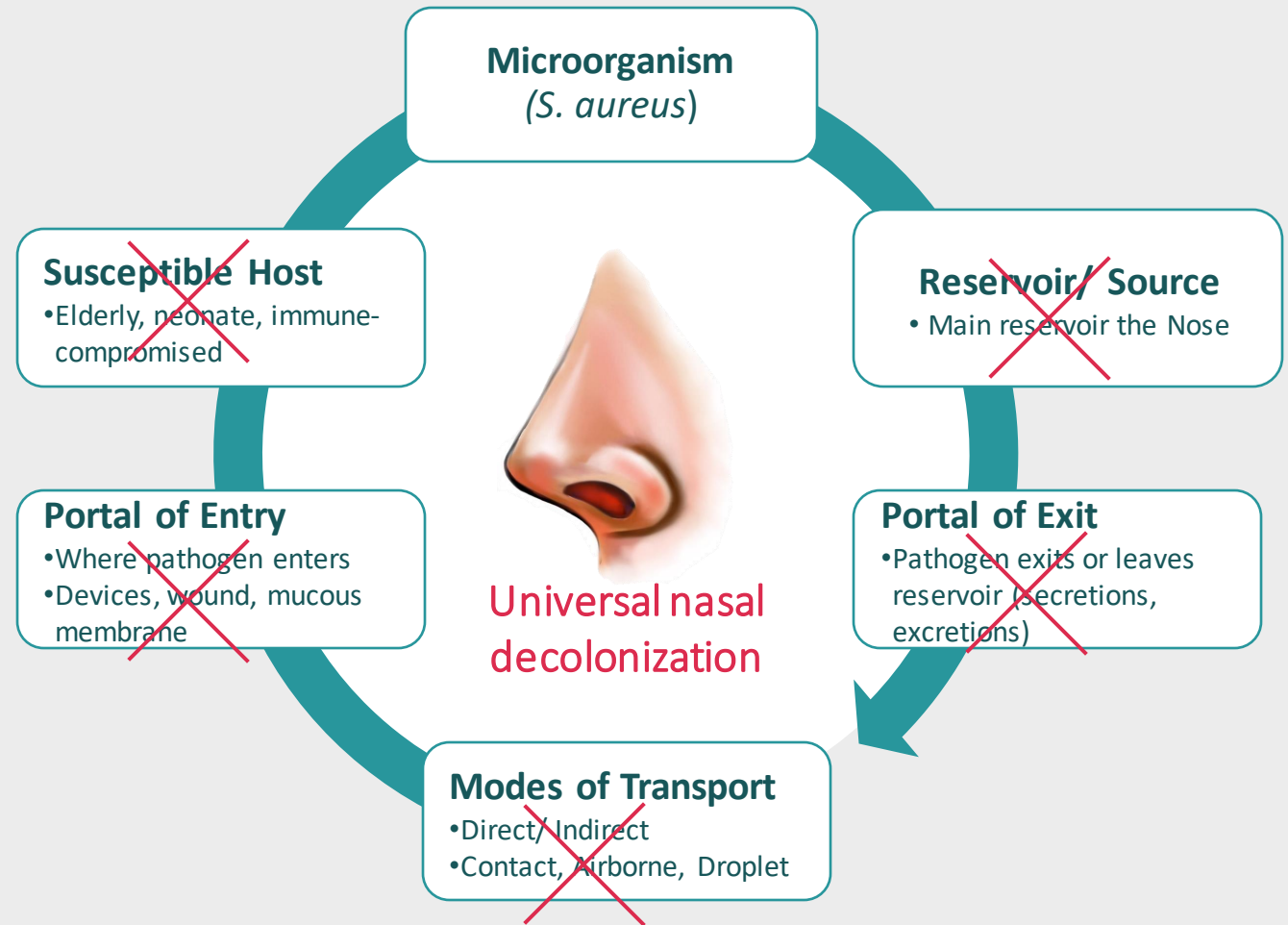
Break the Chain of Infection

ACTIVE SOURCE CONTROL

Help stop self-inoculation and transmission by nasally decolonizing the source/reservoir

- Nasally decolonize the main reservoir
- Prevent portal of exit
- Prevent the transport
- Prevent portal of entry
- Protect the susceptible host

PROTECT ALL PATIENTS

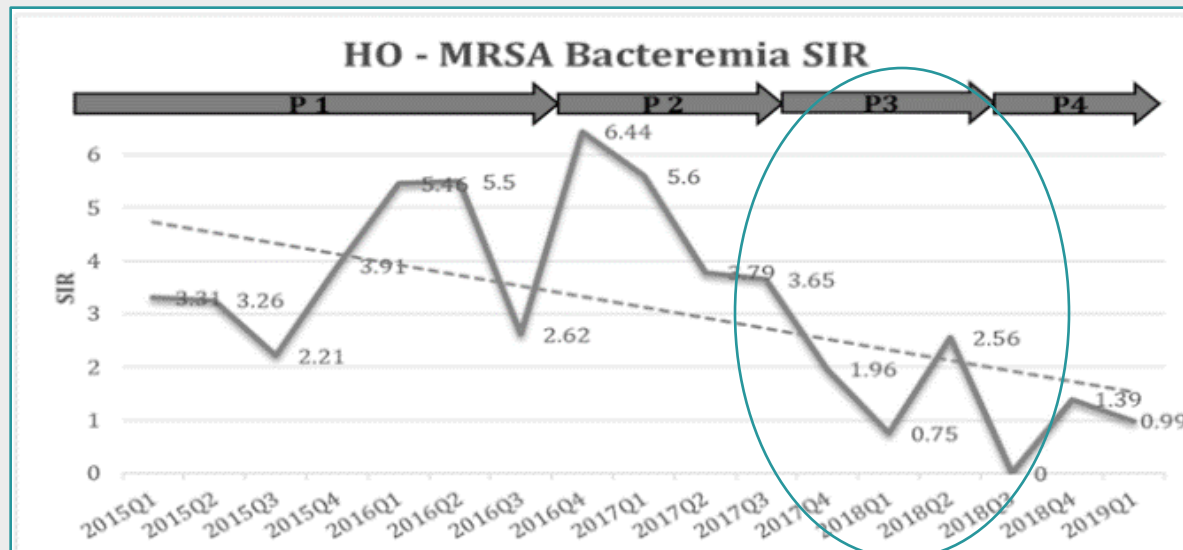


Clinical Evidence
Active Source Control Strategy
Daily Universal Nasal Antiseptic Decolonization

MRSA Bacteremia Reduction

Impact of a stepwise intervention on HO MRSA Bacteremia SIR

Phase 1 (Baseline)	Phase 2	Phase 3	Phase 4
ICU patients: -Target, Screen, and Isolate MRSA (+) -Universal daily CHG Wpes.	ICU Patients -Target, Screen, and Isolate MRSA (+) - ADD: Universal decolonization with mupirocin ADD ALL INPATIENTS -Daily CHG bathing	ALL INPATIENTS <ul style="list-style-type: none"> • STOP Targeting, Screening, and Isolating • ADD <u>Universal Decolonization with Daily Nasal Antiseptic for LOS</u> • Continue CHG bathing 	ALL INPATIENTS <ul style="list-style-type: none"> • Continue Universal Decolonization with Daily Nasal Antiseptic for LOS • Continue CHG bathing • ADD hand sanitizing wipes



74% Reduction in MRSA bacteremia SIR

MRSA Bacteremia SIR decreased significantly from 3.65 (Phase I baseline) to 0.96 (Phase 4)*
 p-value= 0.003

MRSA Bacteremia Reduction

BASELINE MRSA High-Risk Patients

- Target, Screen, and Isolate
- **No CHG protocol**

INTERVENTION All Inpatients

- **STOP** Targeting, Screening, and Isolating
- **ADD** Universal Decolonization with daily nasal antiseptic for LOS

OUTCOME Infection Reduction

100%
MRSA Bacteremia

Poster number 567



Does Universal Nasal Decolonization with an Alcohol-Based Nasal Antiseptic Reduce Infection Risk and Cost?

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IDWeek

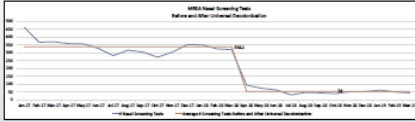
Background:

Nasal decolonization with mupirocin to reduce infection risk, has been associated with mupirocin resistant *Staphylococcus aureus* (SA). A community hospital identified two patients colonized with methicillin and mupirocin resistant SA (MRSA), one scheduled for surgery, one for inpatient IV antibiotic therapy. Instead of mupirocin, an alcohol based nasal antiseptic was applied to these patients twice daily for 5 days, resulting in a negative MRSA nasal screening test in both patients. Neither patient developed an infection during or after treatment. Building on this success, a plan was made to assess the impact of universal nasal decolonization to replace screening and contact precautions for MRSA colonized patients, and to reduce surgical site infections (SSI).

Problem:

- Contact precautions are commonly employed by hospitals to prevent transmission by methicillin-resistant *Staphylococcus aureus* (MRSA) colonized patients
- This measure often results in patient and staff dissatisfaction and increased costs
- Patient safety can be negatively impacted by fewer staff visits into isolation patient rooms
- Patient compliance with pre-operative nasal mupirocin is reportedly less than optimal
- Mupirocin resistant *Staphylococcus aureus* is a documented ongoing concern
- Nasal antibiotic is not in alignment with antibiotic stewardship principles.

Methods: A 26-month before and after study, was initiated in April 2018. The project involved twice daily application of alcohol based nasal antiseptic for all inpatients, and preoperatively for all surgical patients in addition to existing preoperative chlorhexidine bathing. No other practice change was made during this period. Assessment of impact was planned by comparing incidence of MRSA bacteremia and SSI at baseline (2017) and after project implementation, in addition to costs avoided with reduction of nasal screening and CP.



	2017-18 (Screen and treat)	2018-19 (Universal Decolonization)
MRSA Screens	\$ 154,980	\$ 24,200
Green Glove Supplies	\$ 96,197	\$ 83,214
Cost of Mupirocin*	\$ 4,198	\$ 1,381
Cost of Treatment ^b	\$ 504,000	\$ 18,000
Total Cost of MRSA	\$ 759,355	\$ 127,205
Cost of Alcohol Based Nasal Antiseptic	\$ -	\$ 32,050
Costs of MRSA Isolation, decolonization and treatment during each of the study periods.	\$ 759,355	\$ 169,255

*Estimated cost of an ICU-attributable bloodstream infection of \$18,000 (\$7,000-\$29,000) is based on several commonly-cited sources ¹⁻⁴

Financial Disclosure: Nothing to disclose

Results: Compared to baseline, between April 2018 and March 2019, there was a decrease in MRSA bacteremia from an average of 2.14 cases per month to an average of .08 cases per month, a reduction in CP from 3.78 to 1.53/1,000 patient days, a reduction in total annual nasal screens from 3,874 to 605, and a reduction in the incidence of all cause (Gram negative and Gram positive) SSI after all surgical procedures from 3/4,313 procedures to 0/4,872 procedures. After totaling the costs of the nasal antiseptic, use of gloves and gowns, and nasal screening tests – separate from treatment costs – our adoption of universal decolonization resulted in a savings of \$104,100.

Conclusion: House-wide application of alcohol-based nasal antiseptic in place of screening and contact precautions, resulted in a reduced incidence of both MRSA bacteremia and SSI for all types of surgical procedures, in addition to significant costs avoided.

- References:**
1. Roberts RR, Scott RD 2nd, Hota B, et al. Costs attributable to healthcare-associated infection in hospitalized adults and a comparison of economic methods. *Med Care* 2010; 48(11):1526-35.
 2. Scott RD. The direct medical costs of healthcare-associated infections in U.S. hospitals and the benefits of prevention. *Centers for Disease Control and Prevention*. Available at <http://www.cdc.gov/hai/pdf/0410scott.pdf>
 3. Warren DK, Quelli WM, Hollenbeck CL, et al. Attributable cost of catheter-associated bloodstream infections among intensive care patients in a nonteaching hospital. *Crit Care Med*. 2006 Aug;34(8):2094-9.
 4. Roberts RR, Scott RD 2nd, Costello JE, et al. The use of economic modeling to determine the hospital costs associated with nosocomial infections. *Clin Infect Dis* 2002; 36:1424-32.

- **100% Reduction in MRSA Bacteremia.**
- MRSA bacteremia was reduced from 2.14 to 0.
- The universal daily nasal antiseptic was effective in reducing healthcare-onset MRSA bacteremia in all patients.
- This approach is a safe and effective alternative to targeting high-risk patients only and reducing staff and hospital resources for screening and isolating.

Arden, 2019 Open Forum Infect. Dis

MRSA Bacteremia Reduction

BASELINE

- No MRSA/MSSA Risk Mitigation Program
- No Nasal Decolonization
- **No CHG protocol**

INTERVENTION

All ICU Patients

- **ADD** Universal Decolonization with daily nasal antiseptic for LOS

OUTCOME

Infection Reduction

100%
MRSA Bacteremia

Volume 41, Issue S1 (The Sixth Decennial International Conference on Healthcare-Associated Infections Abstracts, March 2020: Global Solutions to Antibiotic Resistance in Healthcare)
October 2020, p. s206

Effectiveness of an Alcohol-Based Nasal Antiseptic in Reducing MRSA Bacteremia in an Adult Intensive Care Population

Lauren Reeves ^(a1), Lisa Barton ^(a1), Michelle Nash ^(a1), Jennifer Williams ^(a1) ... 

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Abstract

Background: Hospitalized patients are at an increased risk of invasive infection with *Staphylococcus aureus* when colonized with the bacteria on admission. Rates of methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia are directly correlated with overall patient acuity, placing patients in intensive care areas at greatest risk. Universal decolonization with nasal antibiotic ointments has been shown to reduce the incidence of invasive MRSA in critically ill patients; however, debate remains regarding the long-term efficacy of this strategy and the possibility of developing antimicrobial resistance. An alcohol-based nasal antimicrobial may be an effective alternative. This study evaluated the effectiveness of a twice daily alcohol-based product in reducing the rate of MRSA bacteremia in an academic tertiary-care adult intensive care setting. **Methods:** Our study was an observational design with retrospective and prospective cohorts each consisting of 61 critical care beds. The baseline incidence of MRSA bacteremia was determined from a 7-month period preceding the implementation of the nasal antimicrobial. At implementation, each admission received an electronic order for an alcohol-based nasal antiseptic that was applied twice daily during the intensive care stay. The primary outcome was the incidence of MRSA bacteremia in each group. MRSA bacteremia was defined by the CDC NHSN criteria after review by an infection prevention nurse. The χ^2 test was used to compare the rates between the 2 groups, and $P < .005$ was considered significant. **Results:** The study periods contained similar patient days, with 12,475 in the retrospective group and 12,733 in the prospective group. The rate of MRSA bacteremia in the retrospective cohort was 0.2404 compared to 0 in the prospective cohort. This rate change was statistically significant, with $P < .0001$. **Conclusions:** The alcohol-based nasal antiseptic was effective in reducing healthcare-onset MRSA bacteremia in this intensive care population. This approach may be a safe and effective alternative to nasal antibiotic ointment that avoids antibiotic resistance risks.

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Disclosures: None

- **100% Reduction in MRSA Bacteremia.**
- MRSA bacteremia was reduced from .2404 to 0 which was statistically significant, with $P < .0001$
- The universal daily nasal antiseptic was effective in reducing healthcare-onset MRSA bacteremia in this ICU population.
- This approach is a safe and effective alternative to nasal antibiotic ointment and eliminates antibiotic resistance risks.

Reeves L et al. *Infect Control Hosp Epidemiol.* 2020. 41(S1)

SSI Reduction

OUTCOME SSI Reduction	INTERVENTION Nasal Antiseptic	PATIENT POPULATION	BASELINE		Author
			Nasal Product	CHG	
56% All-cause SSI all surgical procedures (.61 to .25)	Pre-Op	All Surgical Patients	none	✓	Cernich, 2020 AJIC
79% All cause SSI total joints (1.5 to .34)	Pre-Op and Post-Op	All Total Joint Arthroplasty Patients	none	✓	Bostian, 2018 AAOS
100% All-cause SSI total joints (Hip .91 to 0) (Knee .36 to 0)	Pre-Op and Post-Op	All Total Joint Arthroplasty Patients	none	✓	Franklin, 2020 AJIC

¹Cernich C. *AJIC*. 2020. 48(S8), S50

²Bostian Pet et al. (*AAOS Annual Conference*. 2018.

³Franklin S. *AJIC*. 2020. 48(12), 1501-1503

SSI Reduction

OUTCOME SSI Reduction	INTERVENTION Nasal Antiseptic	PATIENT POPULATION	BASELINE		Author
			Nasal Product	CHG	
81% (.176 to .33) <i>S. aureus</i> SSI Spine surgical procedures	<u>Pre-Op and Post-Op</u> Voluntary Staff Use	All Spine Surgical Patients	Mupirocin Randomly	✓	Mullen, 2017 AJIC
98% (.15 to .017) All-cause SSI all hip procedures	<u>Pre-Op and Post-Op</u>	All Hip Surgical Patients	Mupirocin	✓	Steigmeir, 2018 AAOS
51% (.148 to .073) All-cause SSI all surgical procedures	<u>Pre-Op and Post-Op</u>	All Surgical Patients	Povidone-Iodine	✓	Landis, 2020 AJIC
63% (.27 to .80) All-cause SSI all surgical procedures	<u>Pre-Op and Post-Op</u> Voluntary Staff Use	All Surgical Patients	Povidone-Iodine	✓	Gnass, 2020 Open Forum Infect. Dis

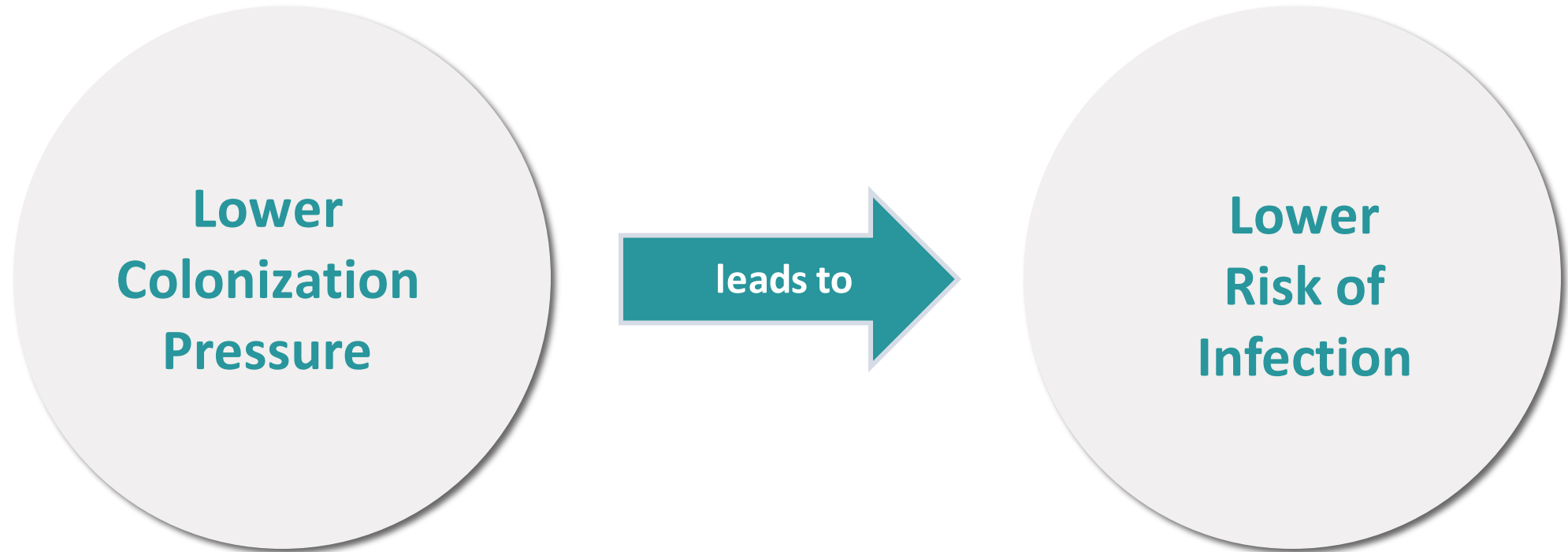
Estimated Avoidable HAIs, LOS, & Re-admissions

Business Case	
8.5 avoidable MRSA infections ((\$30,000 each estimated)	\$255,000
97 Length of Stay days avoided	
33 estimated avoidable MRSA-related readmissions (under 90 days, \$12,000 each estimated)	\$396,000
Total Avoidable Cost (est.)	\$651,000
Product Cost	- \$226,000
Overall Savings	\$425,000

* Sample 200 bed hospital w/ 20 ICU beds

Colonization Risk Profile

Understanding Colonization Pressure



Colonization Risk Profile: 200 Bed Hospital

Colonization Risk Profile 200-bed hospital/annual*	
Total annual admits	12,871
I. MRSA	
1. At admission patients MRSA colonized	644
2. Hospital-Acquired MRSA colonization	415
Total MRSA colonized patients	1,059
II. MRSA/MSSA	
Total MRSA & MSSA colonized patients	4,392
Total MRSA/MSSA colonized patient days	16,398
III. Transmission Risk	
Hospital staff contact with a MRSA & MSSA colonized patient	1,456,142
IV. Readmission Risk	
Patients at elevated risk of MRSA infection-related readmission	1,059



*Illustrative example

Active Source Control™: 200 Bed Hospital

Colonization Risk Profile 200-bed hospital/annual* with Active Source Control	What if?
Total annual admits	12,871
MRSA	
1. At admission patients MRSA colonized	~ 0
2. Hospital-Acquired MRSA colonization	~ 0
Total MRSA colonized patients	~ 0
MSSA	
Total MSSA colonized patients	~ 0
MRSA/MSSA	
Total MRSA & MSSA colonized patients	~ 0
Total MRSA/MSSA colonized patient days	~ 0
Transmission Risk	
Hospital staff contact with a MRSA & MSSA colonized patient	~ 0
Readmission Risk	
Patients at elevated risk of MRSA infection-related readmission	~ 0



Implementation Steps



Recommendations for reducing hospital-onset *S aureus* infections

2019



ICU patients: Decolonize all patients with intranasal anti-staphylococcal antibiotic/antiseptic plus topical CHG.

Non-ICU patients: Decolonize patients with CVC or midline catheter with intranasal anti-staphylococcal antibiotic/antiseptic plus topical CHG.

Surgical patients: For all patients undergoing high risk surgeries (e.g. cardiothoracic, orthopedic, and neurosurgery), unless known to be *S. aureus* negative, use an intranasal anti-staphylococcal antibiotic/antiseptic and CHG wash or wipes prior to surgery.

2022



Provide universal decolonization to **ICU patients**.

Provide targeted decolonization therapy to MRSA-colonized patients in conjunction with AST program.

2021



Decolonization protocols generally include topical and intranasal antiseptics or antibiotics. However, the literature search for this guideline did not find a standardized decolonization protocol. Nasal decolonization is most often performed by applying antibiotics (eg, mupirocin) or antiseptics (eg, povidone-iodine, octenidine, alcohol-based) to the nares.

You Can Do It - Now!

Implement a MRSA/MSSA Colonization Risk Mitigation Program

- Largest impact on HAI/MRSA infections and re-admissions of any single program effort
- Low impact on staff - easy to deploy and scale
- No capital investment
- Improve the quality of patient care and satisfaction
- Potentially reduce CMS penalties associated with HAC and HRRP

In summary

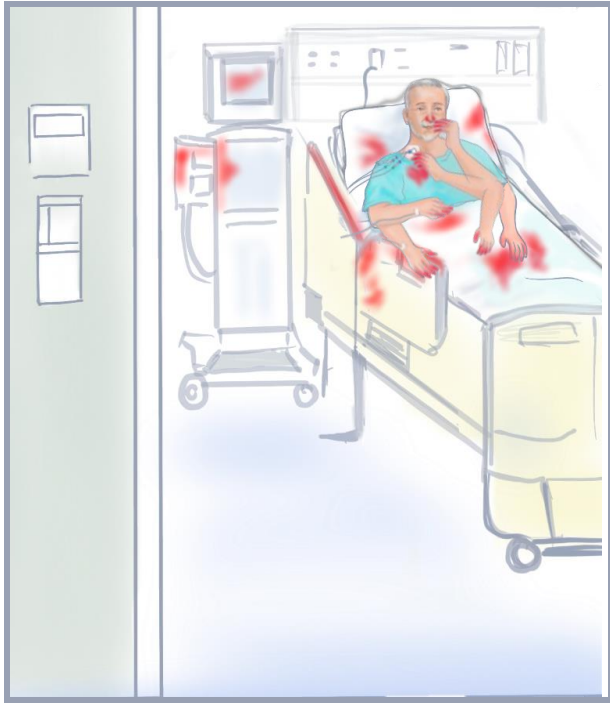
Universal nasal decolonization with alcohol nasal sanitizer when used in addition to current infection prevention practices mitigates the risk of Hospital Associated MSSA and MRSA infections.

Benefits

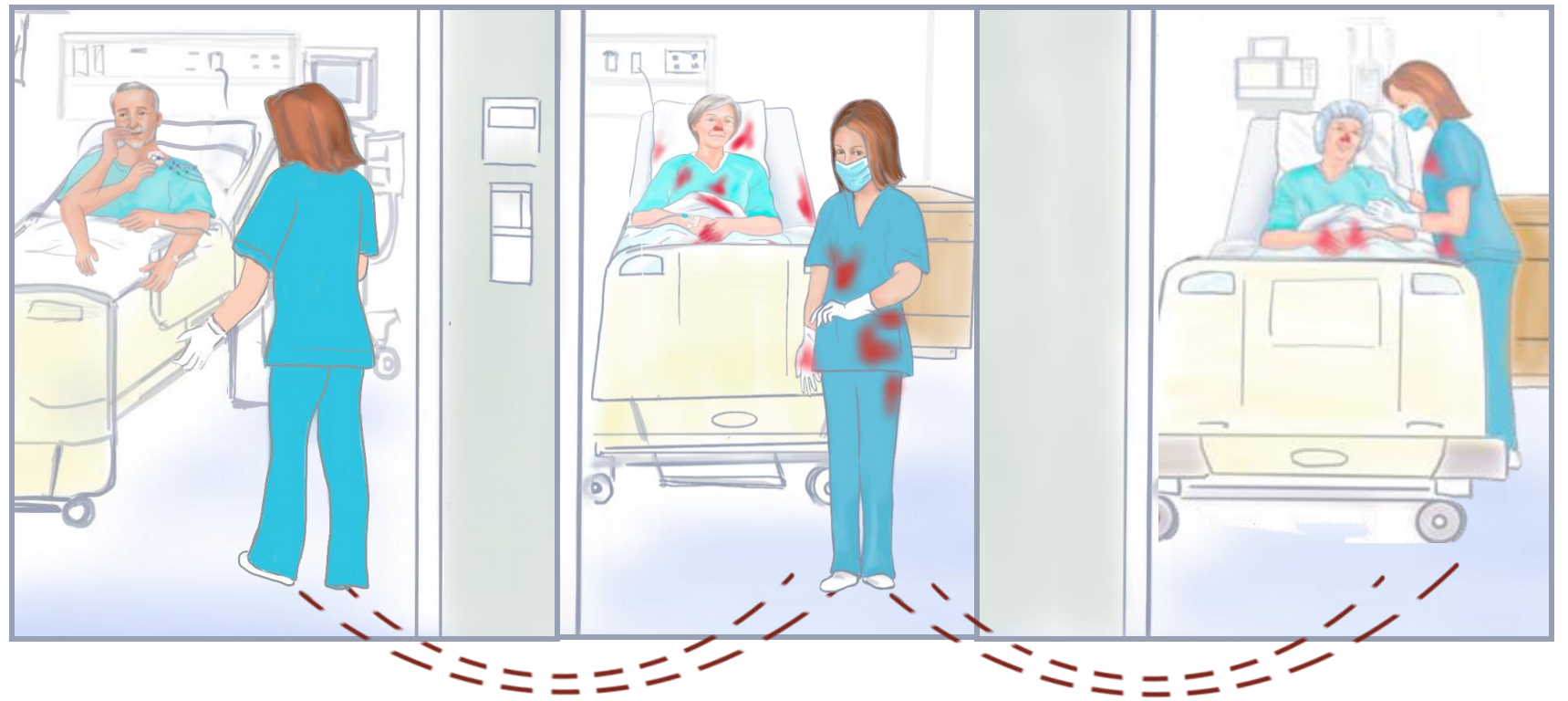
- ✓ Who? All patients
- ✓ Operational efficiency
- ✓ Finance (value proposition)

BEFORE

Self-inoculation



Transmission



SUCCESSFUL RISK MITIGATION PROGRAMS NEED TO ADDRESS

Self-inoculation/Transmission infection risk simultaneously

AFTER - Active Source Control



UNIVERSAL NASAL DECOLONIZATION IS A PROGRAM THAT PROTECTS ALL PATIENTS

From Self-inoculation & Transmission infection risk simultaneously

Attendance Documentation



Scan this QR code or go to <http://qrco.de/bdahMV> to document your attendance in order to receive your CE evaluation.

Note: You will not receive a CE evaluation unless you complete this step.

Questions?

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Resources for Staphylococcal decolonization

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