Quality assessment of individual studies

Study	Selection				Comparability	Outcome			Score
	Representativeness of the exposed cohort	Selection of the non-exposed cohort	Ascertainment of exposure	Demonstration that outcome of interest was not present at start of study	Of cohorts on the basis of the design or Analysis	Assessment of outcome	Follow-up long enough for outcomes to occur	Adequacy of follow-up of cohorts	
Yeoh	★	NA	★	NA	NA	★	★	★	5
Schmid	★	NA	★	NA	NA	★	★	★	5
Uehara	★	NA	★	NA	NA	★	★	★	5
Kang	★	NA	★	NA	NA	★	★	★	5
Oumokhtar	★	NA	★	NA	NA	★	★	★	5
Saxena	★	NA	★	NA	NA	★	★	★	5
Wang	★	NA	★	NA	NA	★	★	★	5
Patel	★	NA	★	NA	NA	★	★	★	5
Souly	★	NA	★	NA	NA	★	★	★	5
Alexander	★	NA	★	NA	NA	★	★	★	5
Aktas	★	NA	★	NA	NA	★	★	★	5
Lai	★	NA	★	NA	NA	★	★	★	5
Ghasemian	★	NA	★	NA	NA	★	★	★	5
Mermel	★	NA	★	NA	NA	★	★	★	5
Johnson	★	NA	★	NA	NA	★	★	★	5
Bogut	★	NA	★	NA	NA	★	★	★	5
Hadley	★	NA	★	NA	NA	★	★	★	5
Duran	★	NA	★	NA	NA	★	★	★	5
Nouwen	★	NA	★	NA	NA	★	★	★	5
Cavdar	★	NA	★	NA	NA	★	★	★	5
Peña	★	NA	★	NA	NA	★	★	★	5
Vas	★	NA	★	NA	NA	★	★	★	5
Oh	★	NA	★	NA	NA	★	★	★	5
Kluytmans	★	NA	★	NA	NA	★	★	-	4
Boelaert	★	NA	★	NA	NA	★	★	-	4
Watanakunakorn	★	NA	★	NA	NA	★	★	★	5
Holton	★	NA	★	NA	NA	★	★	★	5
Pop-Vicas	★	NA	★	NA	NA	★	★	★	5

Berman	★	NA	★	NA	NA	★	★	★	5
Aminzadeh	★	NA	★	NA	NA	★	★	★	5
Kirmani	★	NA	★	NA	NA	★	★	★	5
Lu	★	NA	★	NA	NA	★	★	★	5
Celik	★	NA	★	NA	NA	★	★	★	5
Lederer	★	NA	★	NA	NA	★	★	★	5
Mountricha	★	NA	★	NA	NA	★	★	★	5
Nouwen	★	NA	★	NA	NA	★	★	★	5
Price	★	NA	★	NA	NA	★	★	★	5
Koziol-Montewka	★	NA	★	NA	NA	★	★	★	5

Meta-analysis of Observational Studies in Epidemiology (MOOSE) Checklist

"A Meta-analysis of colonization, time trends and risk of MRSA infection in dialysis patients"

Criteria		Brief description of how the criteria were handled in the meta-analysis
Reporting of background should include		
√	Problem definition	End-stage renal disease patients have a 100-fold higher risk of MRSA infection compared to the general population. A significant proportion of S. aureus infections are of endogenous origin. The burden of MRSA colonization among dialysis patients as well as its time trend and global distribution is unknown. The relative risk of MRSA infection among colonized compared to non-colonized patients in this population is also largely unknown (Page 3).
√	Hypothesis statement	A significant proportion of patients undergoing dialysis are colonized with MRSA. Patients colonized with MRSA are at higher risk for MRSA infection compared to non-colonized.
√	Description of study outcomes	The outcomes of the study are the following: • The prevalence of MRSA colonization among dialysis patients. • The relative risk of ensuing MRSA infection among colonized compared to non-colonized patients (Page 12).
√	Type of exposure or intervention used	Swabbing of nasal or nasal and extra-nasal body sites to isolate MRSA.
√	Type of study designs used	Prospective or cross-sectional and retrospective observational studies (Page 4).
√	Study population	Patients with chronic renal failure who were undergoing dialysis treatment (Page 12).
Reporting of search strategy should include		
√	Qualifications of searchers	The credentials of the four investigators (who contributed to the search strategy) IMZ, FNZ, PDZ and EM are indicated in the authors' list on the title page (Page 1).
√	Search strategy, including time period included in the synthesis and keywords	The search terms were (MRSA OR Staphylococcus OR (methicillin AND resistant)) AND (dialysis OR hemodialysis OR peritoneal). We searched PubMed from 1922– October 2013 and Embase from 1958 – October 2013 (Page 3,11)
√	Databases and registries	PubMed and Embase (Page 11)

	searched	
√	Search software used, name and version, including special features	We did not employ any search software.
√	Use of hand searching	Bibliographies of the retrieved papers (only the included studies) were scrutinized for additional references (Page 11).
√	List of citations located and those excluded, including justifications	Details of the literature search process, including justifications for exclusion, are outlined in the PRISMA Flow chart (Page 22).
√	Method of addressing articles published in languages other than English	A restriction for English language was imposed (Page 11).
√	Method of handling abstracts and unpublished studies	We did not consider abstracts, conference proceedings and unpublished material (Page 11).
√	Description of any contact with authors	We did not contact the authors of individual studies.
Reporting of methods should include		
√	Description of relevance or appropriateness of studies assembled for assessing the hypothesis to be tested	Detailed inclusion and exclusion criteria are described in the paper in the section *Inclusion/Exclusion criteria* (Page 12).
√	Rationale for the selection and coding of data	A data extraction sheet was developed. The extracted data are described in the section *Data Extraction* (Page 12-13).
√	Assessment of confounding	We conducted six subgroup analyses to compare the effects of a number of potential confounders, namely country of origin, modality of dialysis (hemodialysis *vs.* peritoneal dialysis), setting (inpatient *vs.* outpatient), screening policy (one time *vs.* multiple time screening, one time positive *vs.* two time positive screening), body sites screened (nasal *vs.* nasal and extra-nasal). We performed meta-regression analysis to assess the time trends of MRSA colonization (Page 14).
√	Assessment of study quality, including blinding of quality assessors; stratification or regression on possible predictors of study results	We used the Newcastle Ottawa Scale (NOS) to assess the quality of each study. Two authors independently evaluated studies. All studies were deemed of high quality.
√	Assessment of heterogeneity	We used the τ^2 value to assess heterogeneity (Page 14).
√	Description of statistical methods in sufficient detail to be replicated	In the Methods section, we described in detail the type of analysis we used (random-effect meta-analysis, subgroup analysis, meta-regression and diagnostic meta-analysis) and the type of software we used (Stata v11 software package and MetaXL) (Page 14).
√	Provision of appropriate tables and graphics	We included the PRISMA flow chart, Table 1 showing the characteristics of included studies, Table 2 showing

		the results of the subgroup analyses, a supplementary file showing the results of Quality assessment, a Forest Plot showing the pooled estimate of MRSA colonization and 2 Figures of the time-trend of MRSA colonization.
Reporting of results should include		
√	Graph summarizing individual study estimates and overall estimate	In the Forest Plot (Figure 2) we summarize estimates of included studies (Page 20).
√	Table giving descriptive information for each study included	Descriptive information for each of the eligible studies is provided in Table 1 (Page 16-19).
√	Results of sensitivity testing	The results of sensitivity analysis are described in the *Results* section. Figure 3b depicts the MRSA prevalence time trends after 2000.
√	Indication of statistical uncertainty of findings	95% CI were presented for all analyses together with τ^2 values for all meta-analyses.
Reporting of discussion should include		
√	Quantitative assessment of bias	Results of subgroup analyses are discussed with main potential confounding factors discussed. We performed the Egger's test and found no evidence of publication bias (Page 4).
√	Justification for exclusion	Reasons for exclusion were reported in the *Results* section and are shown in Flow chart. The main reason of exclusion was not measuring the outcome of interest (Page 22).
√	Assessment of quality of included studies	We applied the Newcastle-Ottawa quality assessment to measure the quality of included studies (Supplementary Appendix)
Reporting of conclusions should include		
√	Consideration of alternative explanations for observed results	We discussed the limitations of the meta-analysis and we suggested that results should be interpreted with caution (Page 10).
√	Generalization of the conclusions	In our text we underline that "the risk of developing MRSA infection among colonized patients can be impacted by several factors that may be specific to the particular patient, provider, or facility (for example, comorbidities, use of antibiotics for prophylaxis or treatment, and infection control practices). These factors may also change significantly over time and may be very different in different parts of the world. Our estimated risk of infection combines the risk from different settings, patient populations, and healthcare practices and may not apply to a specific center where local epidemiology, infection control policies and patients characteristics may

		impact MRSA infection." (Page 9, 10)
√	Guidelines for future research	Our data underscore the association of MRSA colonization with MRSA infections and future studies are needed to clarify the impact of preventing strategies in reducing the long-term risk of infection (Page 11).
√	Disclosure of funding source	The Brown University Infectious Diseases Program in Outcomes Research is supported through funding from the Warren Alpert School of Brown University, the Department of Medicine and the Division of Infectious Diseases (Page 15).