We searched the English-language literature (MEDLINE to Sept 2014) for prospective evaluations of the central line bundle (hand hygiene, chlorhexidine skin antisepsis, maximum sterile barrier precautions, optimal catheter site selection, daily review of line necessity) on CLABSI" Marang-van de Mheen and van Bodegom-Vos (2015).
Reference:

Marang-van de Mheen, P.J. and van Bodegom-Vos, L. (2015) Meta-analysis of the central line bundle for preventing catheter-related infections: a case study in appraising the evidence in quality improvement. BMJ Quality & Safety. July 16th. .

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Abstract:

BACKGROUND: The central line bundle to reduce central line-associated bloodstream infections (CLABSI) is widely regarded as one of the most evidence-based quality improvement (QI) interventions. Yet, two high-quality trials reached different conclusions about its effectiveness.

OBJECTIVE: To assess the overall evidence on the effectiveness of the central line bundle and also to illustrate issues related to appraising the effectiveness of QI interventions.

METHODS: We searched the English-language literature (MEDLINE to Sept 2014) for prospective evaluations of the central line bundle (hand hygiene, chlorhexidine skin antisepsis, maximum sterile barrier precautions, optimal catheter site selection, daily review of line necessity) on CLABSI. Mantel-Haenszel risk ratios were calculated using a random effects model. Risk of bias was assessed on five domains: comparability of subjects, definition of intervention, assessment of outcome, statistical analysis and co-interventions/heterogeneity. Strength of the evidence was assessed following the Grades of Recommendation, Assessment, Development and Evaluation (GRADE) approach, a widely recommended framework for assessing the robustness of treatment effect and the likelihood of change as a result of future studies.

RESULTS: Across 59 studies, the central line bundle effectively reduced CLABSI by 56% (relative risk 0.44 (95% CI 0.39 to 0.50)). Studies that assessed bundle compliance at the individual patient level reported slightly higher reductions than other studies. Considerable heterogeneity was present in most subgroups. Most studies had unclear or high risk of bias, with only six (10%) studies exhibiting low risk of bias on at least four domains without any high risk. In this subset of higher-quality studies, the reduction was 52% (95% CI 32% to 66%) without heterogeneity. Applying the GRADE framework, the overall strength of the evidence was low, but moderate in quality for the six high-quality studies. This rating is typically interpreted as meaning that further research is likely to have an important impact on our confidence in the effect estimate and may change the estimate.

CONCLUSIONS: That the central line bundle could receive only a moderate evidence rating may suggest that the GRADE framework, developed mostly for traditional clinical therapies, requires modification for QI interventions. GRADE does not distinguish prospective trials (eg, controlled before-after studies and interrupted time series) from lower-level observational studies. On the other hand, that the two highest quality studies reached different conclusions makes it difficult to conclude that future research would not change the effect estimate, especially given evidence of secular trends and the variability of co-interventions to ensure bundle compliance, which created heterogeneity across studies.

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