

Medical Gas Booms, Columns, and Headwalls: Usage, Benefits, and Challenges- Evidence Inconclusive

POSITION STATEMENT

One of the main design challenges for private inpatient critical care rooms is selecting an appropriate system to mount and organize life support and medical utilities such as medical gases, vacuum, data and electrical outlets.

Although, the existing evidence shows the prevalence, benefits, and challenges with all three most relevant design trends (mounted booms, power columns, and headwalls), the evidence to support which system must be used is yet to be investigated. Since the selection of an appropriate system has great impacts on cost and quality of care, the best approach is to investigate this from early stages of design process to make the right decision based on “patient type, functional plan, staff preferences, technology trends, and potential future needs” (Thompson et al., 2012).

A quick summary of the evidence shows a considerable increase in usage of ceiling or wall mounted booms over the past two decades, due to the highest degree of flexibility and patient accessibility comparing with other systems. However, booms are highly expensive and need additional structural support. Overall, there is still a lack of concrete evidence to support the choice of one system over the others.

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EVIDENCE OVERVIEW

The choice of appropriate system to mount and organize life support and medical utilities has a great impact on quality of care and patient/staff satisfaction (Hamilton & Shepley, 2010). Studies showed that over the past two decades (See Fig 1), the use of power columns decreased from 60% to 40%, while the usage of headwalls and mounted booms increased from 13% to 20%, and from 27% to 40%, respectively (Rashid, 2014).

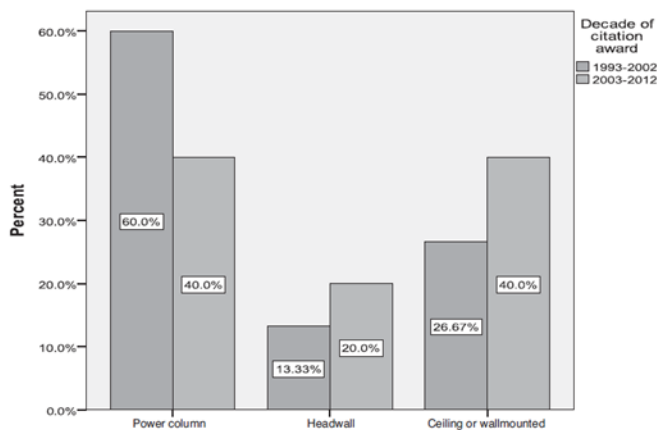


Figure 1. Type of life support utilities (Rashid, 2014)

The traditional headwall system doesn't facilitate either patient transfer or easy access to patient head in case of emergencies. It also causes a complex network of cords and tubes connecting life support and medical utilities to patient bed which may negatively impact patient and staff safety. Providing power columns in one side of the patient bed can allow re-orientation of patient bed and easier access to patient head in case of crisis. However, in order to enhance functionality around the patient bed, two columns should be installed and in this case, columns limit patient transfer similar to headwall systems. It may also be difficult to work around a fixed column in case of emergencies or sensitive procedures (Rashid, 2011).

Comparing with columns and headwalls, ceiling or wall mounted booms provide greater flexibilities, in terms of:

1. 360-degree free access zone to patient in case of emergency, and
2. Easier adaptation to field/technology changes in future (Gambacorta & Charrin, 2011; Thompson et al., 2012).

Booms also help enhance patient/staff safety by organizing cords and tubes off of the floor as well as around the patient which prevent risks of tripping over and disconnecting patient vital links (Worley & Hohler, 2008). Booms can enhance space organization by supporting "patient monitors, IVs, infusion equipment, suction, air, ventilation outlets, telephone, electrical receptacles and more" (Nestor, 2005).

On the other hand, booms are very expensive to buy, install and maintain. They also requires additional structural support. This system may have a potential conflict with patient ceiling lifts that are highly recommended for patient and staff safety. Booms may become stress provoking for patients due to a higher tech look and hanging over them while they are lying on beds. Although booms can be moved, staff tend to have them in a fixed position since they are heavy and require time and skills to get easily maneuvered (Gambacorta & Charrin, 2011; Nestor, 2005; Rashid, 2011).

Finally, an exploratory study by Pati and his colleagues (2008) showed that booms have an advantage over headwalls in case of high-acuity ICU patients and when procedures are performed inside patient rooms. However, in case of lower-acuity ICU patients, as well as when procedures are not typically conducted in the patient room, booms may not provide a proportionate level of advantage when compared with the additional cost involved in its procurement.

Anecdotal notes from practitioners also suggest that often once a boom/column is used- it is seldom moved to a different position, challenging the fundamental assump-

tion of flexibility. It would be timely to study the actual vs proposed usage of booms to determine actual vs. potential use.

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