Studies in the function and design
of non-surgical hospital equipment

5 An investigation of bed-elevators.

Studies in the function and design
of non-surgical hospital equipment

5 An investigation of bed-elevators.

HOEOK

HOEOK

Studies in the function and design
of non-surgical hospital equipment

Royal College of Art
Kensington Gore
London S W 7

The Team:

Director	Professor Misha Black OBE RDI MInstRA FSIA HonDesRCA
Research Fellow	L Bruce Archer AMIED
Design Research	Kenneth M Agnew DesRCA
Nursing Research	Doreen Norton SRN BTA(Hons)
Information Research	Gillian A Patterson BA(Hons)

Report No. 5 by Doreen Norton

Broad consideration of the ways and means to elevate and maintain hospital beds in a longitudinal -tilt position. This enquiry is part of a study programme sponsored by King Edward's Hospital Fund for London.

July 1963

---

5 An investigation of bed-elevators.

Investigation of bed-elevators

Broad consideration of the ways and means to elevate and maintain hospital beds in a longitudinal-tilt position

1. Introduction

This enquiry is result of a request by King Edward's Hospital Fund for London to review the situation regarding bed-elevators in view of the problems reputed to be associated with the bed-tilting procedure.

The findings are based on study of pamphlet data of equipment specially designed for this purpose, analysis of replies from sixteen hospitals using the various types of apparatus and upon the professional judgement of the author.

2. Definitions

Originally, the term 'bed-elevator' was exclusive to an A-section metal frame with supporting lugs down each side of one sloping face, and was used at either end of a bed to maintain a longitudinal tilt. The bed required to be manually lifted until the bedrail rested upon a pair of lugs at the appropriate height. In practice, therefore, the frame was not an elevator but a prop. The frame itself, by reason of its shape, was cumbersome both in handling and in use and was difficult to store.

3. Classification and analysis of types of 'elevators'

Z. PROP (chairs, stools, wooden blocks or A-section metal frame)

= manual elevation, bed-retained prop.

Excluding the use of chairs and stools, all hospitals are likely to possess bed-tilt props of either wooden blocks or metal frames or both.

A. ELEVATOR for inserting PROPS

= mechanical elevation, bed-retained prop, elevator removed.

Although eliminating manual lifting, they introduce a second item to the bed-tilt operation requiring to be collected and stored, but once Props are in position the lifting device is immediately available for further use.

B. ELEVATOR/PROP

=mechanical elevation, bed-retained elevator.

By reason of being bed-retained, a supply will need to be available, the number being determined by the ward demand

for bed-tilting and the urgency of that demand.

C (1) ELEVATOR/PROP/TRANSPORTER

= mechanical elevation, bed-retained elevator, mobile without brakes.

Same as for 'B' but can be wheeled to the site and when in position the mobile bed retains its mobility in the tilt position. The wheeling feature presents instability of the apparatus when not in use (requiring it to be hung or laid flat in storage), and instability of the bed when attached unless brake castors are present at the floor-standing end of the bed.

C (2) ELEVATOR/PROP/TRANSPORTER

= mechanical elevation, bed-retained elevator, mobile with brakes.

Same as for 'B' with the mobility properties of C(1) but capable of being stabilised.

4. Selection of 'elevators'

Confusion exists around the term 'elevator'. Some hospitals appear to require merely a lifting device for insertion of props they already possess - in other words, a type 'A'. Some appear to require a lifting device which is also the Prop, namely, types B, C(1) or C(2), all of which need a supply based on likely ward demand. Of these, type C(2), in theory, appear to be the most desirable. In practice, variation in specific models will need to be assessed in relation to any peculiarities in the bed such as the presence of Balkan beams and extention apparatus (orthopaedic requirements); one model known to be available (a type 'B') is designed for the presence of such apparatus.

Within limited data, the range of types available appears to meet the above needs if hospitals decide on the functions they require in the apparatus and select.

5. Considerations of the question of bed-tilting

In units where bed-tilting is a constant feature of treatment, viz., orthopaedic, thoracic and neuro-surgery, it seems likely that they have found means of achieving it to their individual satisfaction.

In general surgical wards, bed-tilting for short periods is a common occurrence (post-operative and in the treatment of shock etc.). Here, hospitals may or may not have arrived at an individually satisfactory solution, but with the growing tendency to nurse such patients in beds which incorporate a tilting mechanism it is conceivable that any demand for an independent piece of equipment to achieve it is a diminishing one.

In general medical wards, the occasions for bed-tilting appear to be reletively infrequent. When it does arise it may be constant and prolonged (as in the treatment of a patient with a circulatory condition affecting the lower limbs) or at intervals for short periods throughout the 24 hours (to promote postural drainage of the lungs). As beds which incorporate a tilting mechanism are unlikely in such wards in the immediate future, any demand for an independent tilting apparatus seems likely to remain. On the other hand, the variety of 'elevators' already available appears to adequately meet and satisfy specific requirements - the emphasis being on clear definition of type and careful selection.

6. Consideration of the possibility of excluding the tilting mechanism from Hi-Low beds.

The tilting feature incorporated in the mechanism of the manually operated hi-low bed appears often to result in the bed being out of alignment when being adjusted in height with consequent damage of the working parts. Elimination of the tilting feature from all future hi-low beds does not appear justified on these grounds, but indicates the need for improvement in the design of the dual-purpose mechanism and instruction in the correct operating of such beds.

There may be a case for a bed which is simply 'hi-low' for use in wards where the need for longitudinal tilting is so occasional that it could be met by the use of an independent 'elevator' (for example, in geriatric wards). The effect of superimposing a tilt upon a bed with hi-low mechanism is unknown, however, and cannot be assessed as a bed of this kind does not appear to exist in this country.

7. General conclusions

Indications are that the present range of 'elevators' offers an adequate choice to meet and satisfy existing varied needs, and that any future development of 'elevators' cannot be considered in isolation from the bed.