B6B. A low-cost cushion for management of pressure ulcers

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Summary
A planar foam cushion with a hole cut in the area coinciding with a pressure ulcer provides excellent pressure relief compared to commercially available cushions and allows the user continued mobilisation. The cushion is low-cost and can be customised and issued in a single appointment.

Aims & Objectives
A pressure ulcer is usually located over an area of sustained high interface pressure, such as a bony prominence (1, 2). A method was investigated of cutting a hole in a simple foam cushion corresponding to an area of high interface pressure. The method aims to reduce or eliminate pressures over a pressure ulcer, allowing the wheelchair user to continue sitting with reduced risk to the affected area.

Background
A wheelchair user presented with a pressure ulcer over an ischial tuberosity from sitting on a commercially available cushion issued by the wheelchair service. Pressure mapping confirmed the presence of high interface pressure in this area. In order to find a suitable alternative product a healthy volunteer was pressure mapped on a range of cushions while sitting with an oblique pelvic position to replicate a high localised pressure over one ischial tuberosity. Published studies (1-4) have shown that some cushions perform better than others. A similar result was found in this study, but no cushion was able to acceptably reduce pressure in the at-risk area. However, it was found that a simple foam cushion with a hole cut into it at the location of the ischial tuberosity was able almost completely to eliminate pressure in that area.

Technique
A foam cushion made of 2" of CMHR 65 topped by 2" CMHR 40 is cut to match the size of the client's current cushion. The client is pressure mapped while sitting on the foam cushion. A BodiTrak (Vista Medical) pressure mat was used in this study. The location of the high-pressure area is noted on a laptop display. The client is then hoisted from the cushion ensuring that the pressure mat is not accidentally moved in the process. The high-pressure area is located again manually, using the display as a guide and marked on the foam with a felt tip pen. A hole is then cut through the entire thickness of the cushion using a sharp knife and a Bosch foam cutter. When the client is placed back on the cushion the area where the hole is cut will show much reduced pressure. The hole may be modified slightly if it does not satisfactorily capture the entire area at risk. The cover from the original cushion can be used if it is loose enough to drape into the hole, or a custom cover can be made if necessary. A final check of the pressure is done with the cover on.

Results
Experience to date is that clients are able to use their wheelchairs for longer periods than when using their previous cushions while the pressure ulcer heals, due to the affected area being largely free of interface pressure. One client has now used his cushion for three years with no recurrence of the pressure ulcer.

Discussion
This method has been used for three wheelchair users, all with different diagnoses, but all with high pressure over one ischial tuberosity. The advantages are that a cushion of this type is very low cost (under £10) and that it can be prepared in advance, then pressure mapped, modified and handed over at the same appointment.

While clients feel that they can use their wheelchairs for longer than would otherwise be the case, they are always cautioned to follow the advice of their tissue viability nurse or district nurse if the pressure ulcer is being actively treated.

Investigation may be needed to determine if transferring the weight to surrounding intact tissues creates a risk to the microcirculation and lymphatic drainage of the affected area compared to the usual advice of frequent weight shifts and the use of other pressure relieving interventions such as alternating pressure cushions (5, 6).

Further development of this technique could explore the efficacy of different density foams or shaping the cushion such as with a ramp. A custom carved foam cushion may also be suitable for further modification by the addition of a hole in the foam under an at-risk prominence such as an ischial tuberosity, coccyx or greater trochanter.

References

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