

# Custom Moulded Lying Supports



## Introduction

Modular, off the shelf lying supports are adjustable and require a great deal of knowledge and practice in order that they are used correctly and effectively. Conversely a **custom-made, moulded mattress or modular support** could be more appropriate and provide an **easier to use** and **more repeatable solution**.

## Aims and objectives

To provide a full body postural support for use in bed - profiling or standard, in lying positions – supine, prone or side lying. To be **used easily, with minimal training**, in **multi carer situations**. To offer a secure and **contained postural position** to keep the client in the required position for a whole nights sleep, **without separate parts moving out of position**.

## Background

Consolor is fully supportive of the provision and use of night time lying supports as part of a 24 hour postural management programme. We are however aware of the requirements of training of carers, subsequent skills needed in use, time involved in setting up and maintenance of a support system through the night of some off the shelf systems. We wanted to and have been asked to make supports that would require **minimal maintenance** and **training** and additionally provide secure and **repeatable support throughout the night**.

## Technique

A **full postural assessment** was carried out for the clients so that I could understand their posture in both lying and sitting. Subsequently a **full understanding of the clients' postures** was gained along with an understanding of the **goals** that were hoping to be achieved through the integration of the equipment.



## Assess

posture and Range of Movements to establish optimal postural positioning

## Shape capture and Anatomical measurement

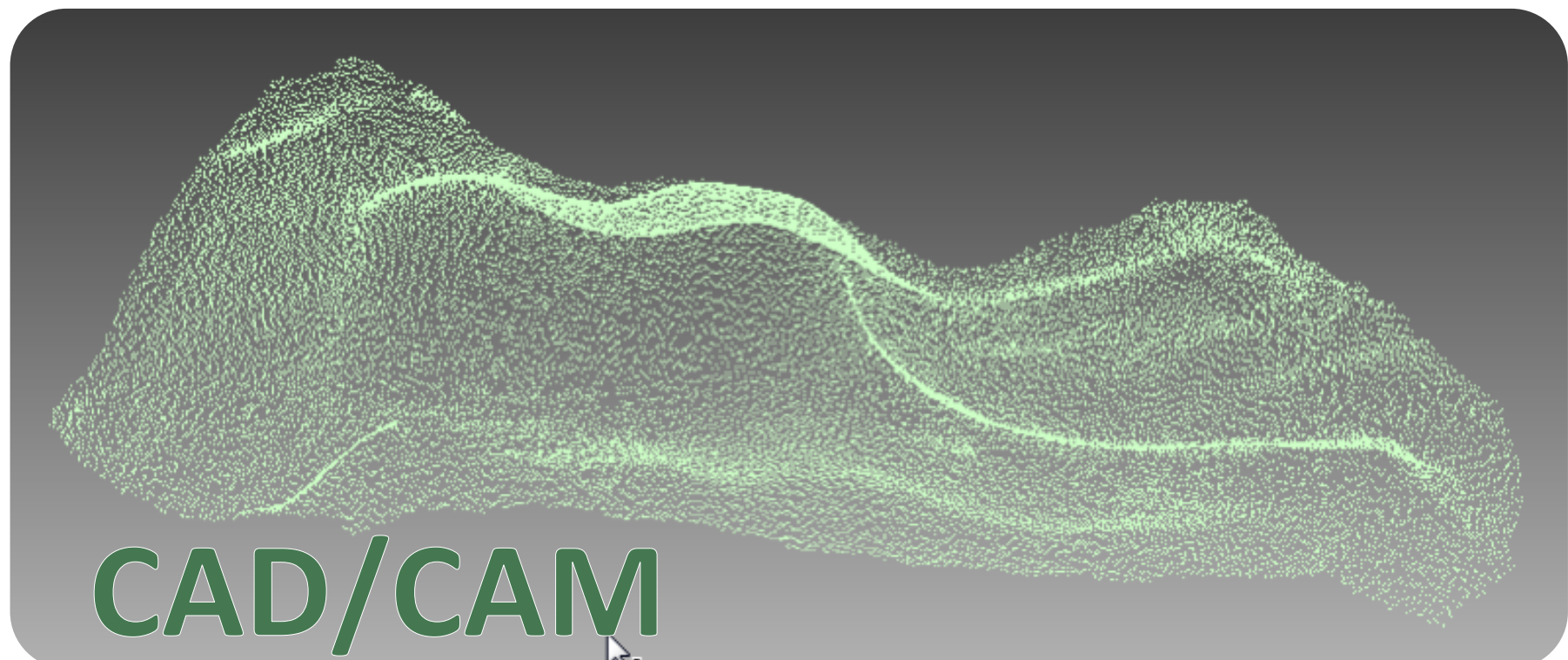
A large vacuum moulding mattress was then used to mould the clients in order to **capture their shape** and to temporarily provide support in the required anatomical places to support and give the clients the best possibility of staying in the chosen position during the night.



## Mould

client using vacuum mattress / vacuum consolidation technique

The moulded mattress was then “scanned” with a hand held scanner designed for capturing the 3D contours in a digital form on a computer.



## CAD/CAM

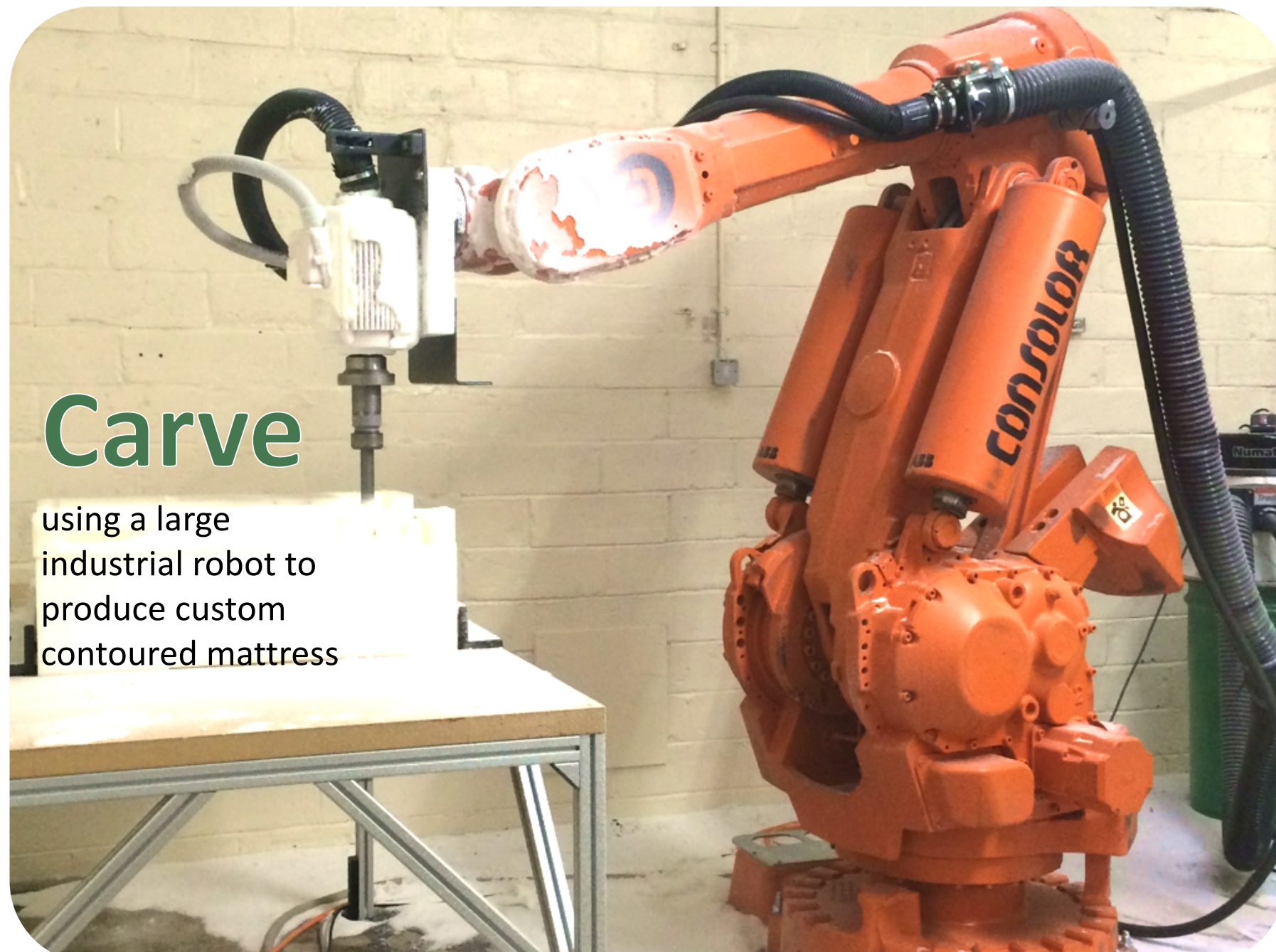
software to “design” the support so that the robot will be able to make the shape. The picture shows a whole body shape made up from thousands of points to define the geometric shape digitally

## Standards/guidelines

A risk assessment is carried out for every client when being assessed/provided with a contoured lying support. A multi-disciplinary team approach is used in order that everyone can be in agreement of the goals and adopting the same approach to **moving and handling and postural management**.

## CAD/CAM software

A bespoke manufacturing system made up of various software is used to turn the **digital image captured** into data that can then be used by the robot to carve the contours into a large block of large open cell foam. The mattress is then removed from the robot station and finished by hand and cut into separate pieces if it is intended to be of a modular construction.



## Carve

using a large industrial robot to produce custom contoured mattress



## Check

Modular custom contoured lying support ready for a trial fit



## Mid Fit

Modular custom contoured lying support being tried in profiling bed



## Delivery

## Clinical detail

The supports provided aimed to **improve, support and protect postural shape** in a lying position and to secure the body **comfortably** in order to **promote relaxed posture**. Additionally night time feeding tubes were used and these could become tangled and dangerous. Additionally the advice being given for their use is that the head end of the bed is elevated, in order to elevate the trunk of the client and reduce the chance of choking on the feed.

## Modular Supine Support

Pat exhibited **high tone** which throughout the night would **slide** her down the bed. Her use of a **feeding tube** until midnight required that her **upper body** was kept in an **elevated** position, through use of a profiling bed. I was asked to solve the problem of her sliding down the bed throughout the night which caused the problem of her feet getting squashed against the footboard and as she would then not be in a semi upright position the “feed” could be dangerous and possibly cause asphixiation. The additional requirement was that as the feed was stopped at midnight we did **not want to have to disturb the night's sleep** by fitting a sling and hoisting off of the lying support, to then be put back to bed without the lying support, if so required.

The solution was to assess and mould as previously described but during manufacture to **cut the one large contoured support into separate parts**. The key to all this was that the **bed mattress** would be the **main support** surface through which the spine, trunk and pelvis would be supported and the modular custom contoured support would be fitted around Pat. So the support could be **added or removed while not requiring Pat to be hoisted off the bed**, the photos below show the way the separate parts of the support fit together around her.



## Modular Side Lying Support

Danielle, a young woman with a learning disability, has to stay on her feed throughout the night. She **wiggles and moves around** a lot during the night, she ends up being in a foetal position in the bottom corner of her bed. The aims for Danielle's support were to **improve** her position that she adopted throughout the night and to protect the **feeding tube** from detaching. To decrease the intervention of her parents through the night to **increase their sleep** was also desirable.

Danielle is used to **sleeping on her side** and it was felt that there was not any chance of persuading her to sleep on her back. We wanted to not limit Danielle to sleeping on just one side, so the challenge was to make one support that would **suit lying on the left and right sides** – the symmetry in her posture was the key to the answer and solution.

I moulded Danielle on her right side in her preferred position. I gradually adjusted her position to be **less flexed** than the complete foetal position, to encourage her to be in a better position and also to **accept it**. When we came to manufacture the support, rather than carving it to be a **3D contoured surface** we cut out a **profile** of Danielle side lying and extruded it through the block.

The result was a symmetrical block with a Danielle shaped whole through it. This meant it could be used to support Danielle lying on her **right or left hand side** and she could be (and is) **swapped from one position** to the other during the night. Parents reported that it was well received and Danielle's sleeping through the night was much less disturbed.



## Right side lying

ready for client to be hoisted onto bed and moved into position



Lying support shown fully assembled, apart from theommel which is laying on top

Back part has now been fitted to provide a fully circumferential support,ommel is also fitted between knees. The whole support could be flipped over to allow **left side lying**



## Results and Testing

We have made a number of these supports now and although relatively low in numbers every support issued has been well received. They have all proved successful in their use in real situations and solved the problems that they were aiming to solve.

## Discussion

There are various “off the shelf” CE marked, lying supports/positioning systems on the market. Like all specialist equipment they depend upon a certain amount of skill and training for their correct usage. This often involves numerous parts to be fitted around the client in the correct manner in order that they are effective. Once these separate parts are in place, they are only effective if they stay in their correct place during the time of using the equipment. They may need repositioning and therefore, so may the client. We have been approached where “off the shelf” equipment has been used but not worked in situ for a number of reasons: separate parts not being placed in the correct position around the client, individual parts moving out of position, whole support not being strong enough to stay in place and keep client in place. We wanted to make supports that would be **simpler to use** and more effective in their use, in order to hold the person in position for a longer period of time throughout the night. Although a custom made support would involve a **very thorough assessment** in order for the correct shape to be produced in the support and offer **little adjustment** to accommodate change of body shape over time, so would therefore be unlikely to be suitable for children and more ideally suited to adults.

## References

- The Chailey Approach to Postural Management - TE Pountney, CM Mulcahy, SM Clarke, EM Green.
- Postural Care: Protecting Body Shape – John Goldsmith, Liz Goldsmith, Polly Mears, Anna Waugh.

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