

3DPiPPIn plain English Summary

What was the study about?

People with obstructive sleep apnoea (OSA) often stop breathing when they are sleep. This can make them very tired and increase risks of other health problems. The most common treatment is Positive Airway Pressure (PAP) therapy. PAP is a machine and a mask to keep the airway open. Many people find the mask uncomfortable or poorly fitting. Air leaks and skin sores are common. These problems can make people stop using the treatment

Our research tested whether making a made to measure mask using 3D printing could improve treatment compared to standard masks. We also explored people's experiences of living with PAP therapy. Lastly we looked at how patients were involved in shaping the study.

What did we do?

- We ran a randomised controlled trial. There were 160 adults who were starting PAP therapy for OSA.
- Half received a standard mask, and half received a made to measure mask. The made to measure mask was built using a 3D scan of their face and 3D printing.
- We measured how well breathing was managed, mask leaks, comfort, and how often people used the treatment. We measured this for six months.
- Next, we interviewed patients about their experiences.
- Finally, we worked closely with a Patient Advisory Group to design and deliver the study.

What did we find?

- The made to measure masks did not improve how well breathing was managed compared to standard masks.
- In fact, they had more air leaks. Patients also used their machine slightly less with the made to measure mask.
- Comfort and side effects were similar with both masks.
- Many people found PAP therapy life-changing. Others struggled to use it regularly.
- Patients told us that starting PAP therapy can feel overwhelming and affects daily life, relationships, and even identity. Support from healthcare teams and family was very important.

- Our Patient Advisory Group helped improve study materials and recruitment. They highlighted the need for clearer information and help and reassurance when starting treatment. We found that being part of the advisory group affected members in a positive way.

What does this mean?

Masks made to measure built with current 3D printing technology are not ready for routine use. More work is needed to improve how the mask is made before they can offer real benefits.

The study also shows that listening to patients' experiences is vital. Success means more than wearing the mask. It has to fit into daily life.

Where can I find out more?

- Watch our short animation explaining the study:
<https://vimeo.com/1094998386?fl=ip&fe=ec>
- See our infographic: <https://3dpippin.co.uk/#Results>

Trial registration

ISRCTN 74082423

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Ethics

Approved by Hampshire B Research Ethics Committee (22/SC/0405).