



## Research Article

# Cost-effectiveness of bioimpedance-guided fluid management in patients undergoing haemodialysis: the BISTRO RCT

Mandana Zanganeh,<sup>1\*</sup> John Belcher,<sup>2</sup> James Fotheringham,<sup>3,4</sup>  
David Coyle,<sup>5</sup> Elizabeth J Lindley,<sup>6</sup> David F Keane,<sup>7</sup> Fergus J Caskey,<sup>8</sup>  
Indranil Dasgupta,<sup>9,10</sup> Andrew Davenport,<sup>11</sup> Ken Farrington,<sup>12</sup> Sandip Mitra,<sup>13</sup>  
Paula Ormandy,<sup>14</sup> Martin Wilkie,<sup>4</sup> Jamie H Macdonald,<sup>15</sup> Ivonne Solis-Trapala,<sup>2</sup>  
Julius Sim,<sup>2</sup> Simon J Davies<sup>2</sup> and Lazaros Andronis<sup>1</sup>

<sup>1</sup>Centre for Health Economics at Warwick, University of Warwick, Coventry, UK

<sup>2</sup>School of Medicine, Keele University, Keele, UK

<sup>3</sup>School of Health and Related Research, University of Sheffield, Sheffield, UK

<sup>4</sup>Sheffield Kidney Institute, Sheffield Teaching Hospitals NHS Trust, Sheffield, UK

<sup>5</sup>NIHR Devices for Dignity, Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield, UK

<sup>6</sup>Renal Medicine, Leeds Teaching Hospitals NHS Trust, Leeds, UK

<sup>7</sup>CÚRAM SFI Research Centre for Medical Devices, University of Galway, Galway, Ireland

<sup>8</sup>Population Health Sciences, University of Bristol, Bristol, UK

<sup>9</sup>Renal Medicine, University Hospitals Birmingham NHS Foundation Trust, Birmingham, UK

<sup>10</sup>Warwick Medical School, University of Warwick, Coventry, UK

<sup>11</sup>UCL Department of Renal Medicine, Royal Free Hampstead NHS Trust, University College, London, UK

<sup>12</sup>Renal Medicine, East & North Hertfordshire NHS Trust, Hertfordshire, UK

<sup>13</sup>Manchester Academic Health Sciences Centre (MAHSC), Manchester University Hospitals and University of Manchester, Manchester, UK

<sup>14</sup>School of Health and Society, University of Salford, Manchester, UK

<sup>15</sup>Institute for Applied Human Physiology, Bangor University, Bangor, UK

\*Corresponding author [mandana.zanganeh@warwick.ac.uk](mailto:mandana.zanganeh@warwick.ac.uk)

Published September 2024

DOI: 10.3310/JYPR4287

## Plain language summary

Cost-effectiveness of bioimpedance-guided fluid management in patients undergoing haemodialysis: the BISTRO RCT

Health Technology Assessment 2024

DOI: 10.3310/JYPR4287

NIHR Journals Library [www.journalslibrary.nihr.ac.uk](http://www.journalslibrary.nihr.ac.uk)

## Plain language summary

'Bioimpedance' is a measure of how difficult it is for an electric current to pass through a biological object. Bioimpedance is used in devices that assess fluid status (over- or under-hydration) because it is very sensitive to the amount of water in tissue.

Bioimpedance can be used in addition to clinical judgement when deciding how much water should be removed from someone with kidney failure during a dialysis treatment session. This is the first study to examine whether using this treatment represents a cost-effective use of National Health Service resources.

We carried out an economic evaluation within a large randomised controlled trial in patients with kidney disease undergoing haemodialysis. We calculated the additional costs and quality-adjusted life-years (a measure that combines quality and quantity of life) using established methods.

Over 2 years, our study showed that taking into account bioimpedance measurements about target weight resulted in slightly lower costs and marginally more quality-adjusted life-years, although there is uncertainty around these findings.