Method for Reducing Nephrotoxic Effects Induced By Radiographic Contrast Material

Tech ID: 25077 / UC Case 2011-038-0

INVENTION NOVELTY

A low frequency ultrasound-based method to minimize nephrotoxicity induced by radiographic contrast media (e.g. contrast agent or dye) when using diagnostic tests such as MRI, CT scans, and angiograms.

VALUE PROPOSITION

Diagnostic medical imaging— in large part MRI, CT, and PET — is a pillar of modern medicine and it is heavily being used in the US healthcare system. Despite the proven clinical benefits of medical imaging, it is not risk free; radiographic contrast media is necessary to perform many of the diagnostic tests. The contrast media can particularly affect the kidneys and result in a rare condition known as contrast material-induced nephropathy (CIN) — patients with chronic kidney disease, diabetes, and history of heart disease are at higher risk to suffer from this condition. In order to mitigate the risks associated with X-ray imaging, clinicians invested major efforts in identifying effective preventive interventions for CIN. Several of the approaches tested in clinical setting — such as administration of pharmacological agents — to offset the nephrotoxic effects have yielded inconsistent results, thus a new approach is warranted.

TECHNOLOGY DESCRIPTION

UCSF investigators have demonstrated that applying low-frequency ultrasound stimulates endothelial nitric oxide synthese activity, which promotes the release of nitric oxide (NO) in preclinical models. NO functions as a vasodilator that enhances medullary perfusion and prevents reactive oxygen species-mediated kidney injury. The inventors translate their findings to clinical setting by describing the following noninvasive approach: 1) the system may comprise of two transducers separately applying low frequency ultrasound to each kidney without interfering with x-ray imaging; 2) patients would receive treatment prior to, during, or following administration of radiographic contrast media; and 3) this technology can be designed as a stationary or a wearable device dependence on clinical

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OTHER INFORMATION

KEYWORDS

Contrast induced nephropathy, Chronic kidney disease, Low frequency ultrasound, Diagnostic medical imaging

CATEGORIZED AS

- **Medical**
  - Devices

RELATED CASES

2011-038-0

requirements. Overall, this technology has potential to provide an effective and safe remedy for CIN.

Advantages

- Non-invasive therapeutic modality to treat CIN
- Reusable device
- No known side effects

APPLICATION

Treatment for radiographic contrast material-induced nephropathy

LOOKING FOR PARTNERS

To develop and commercialize this technology as a method of reducing nephrotoxic effects induced by radiographic contrast material

STAGE OF DEVELOPMENT

Preclinical

Inventor Profile

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PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,328,287	06/25/2019	2011-038
United States Of America	Issued Patent	9,420,990	08/23/2016	2011-038
United States Of America	Issued Patent	8,585,597	11/19/2013	2011-038

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