Describe an innovation/research area in interventional radiology and discuss its impact on current/future IR practices.

Interventional radiology (IR) is a vital and rapidly-evolving domain of modern medicine, heavily utilising cutting-edge equipment and research. Since its inception, IR has enabled therapies that have largely supplanted the need for major surgery and its associated financial expenses and morbidity, as well as made novel treatment approaches possible. Although the field has and continues to thrive in the developed world, less economically-developed countries (LEDCs) have struggled in adopting IR due to financial, logistical (e.g. geographical availability), and intellectual (i.e. staff training) constraints[1,2]. The successful introduction of IR in these areas is therefore heavily dependent on developing equipment which is financially accessible and useable within the existing healthcare system as well as clinically efficacious.

One fundamental IR intervention which would significantly improve patient care in LEDCs is catheter embolisation to treat the exceedingly high mortality from malignancy and haemorrhagic presentations in traumatic, peri-partum, and post-operative bleeding[3]. However, conventional embolic agents are often unobtainable because they are either prohibitively expensive or the manufacturer does not sell within the geographical region[4]. This shortage greatly limits the availability of embolisation therapy even where facilities are appropriate and staff are adequately trained. If this ongoing issue of scarcity was successfully overcome and staff training and facility development was maintained, regular embolisations could be done reliably and would considerably benefit patients.

A possible solution to address this shortage is the development of agents which can be manufactured locally and at a low cost. One such innovation by Vidal et al. considers the use of suture fragments as a form of particulate embolisation therapy; a method which the team has termed the 'FAIR-Embo Concept'[5]. Importantly, these fragments would be cut from relatively widely-available and inexpensive suture materials. This process would also, in itself, not require significant training to carry out. Therefore, this solution would be accessible financially, logistically, and intellectually to interventional departments, thereby overcoming the previously discussed barriers to IR development in LEDCs.

A pre-clinical trial by the group has indicated that this process is safe and effective, successfully yielding selective embolisations without off-target effects. The group aims to further investigate the feasibility of the intervention by assessing the applicability to tumour embolisation and then carrying out a clinical study to demonstrate the feasibility of the method in humans.

Although obviously conditional on further research, success in the FAIR-Embo endeavour could directly result in a massive improvement in mortality across the developing world. Indirectly, this solution could reduce healthcare costs and complexity in areas where the continuity of care is often lacking, therefore achieving success where other IR treatments that have been specifically designed for use in developed countries have failed. Perhaps even more importantly, the impact of FAIR-Embo on translating embolisation therapy across healthcare systems could herald a new approach for promoting accessibility to other aspects of IR across the world using cost-effective, relatively simple, and locally-produced equipment.

It is therefore an area of innovation which has potentially revolutionary ramifications for the future of IR, hence its role as the subject of this essay.

Word Count: **500 words**

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