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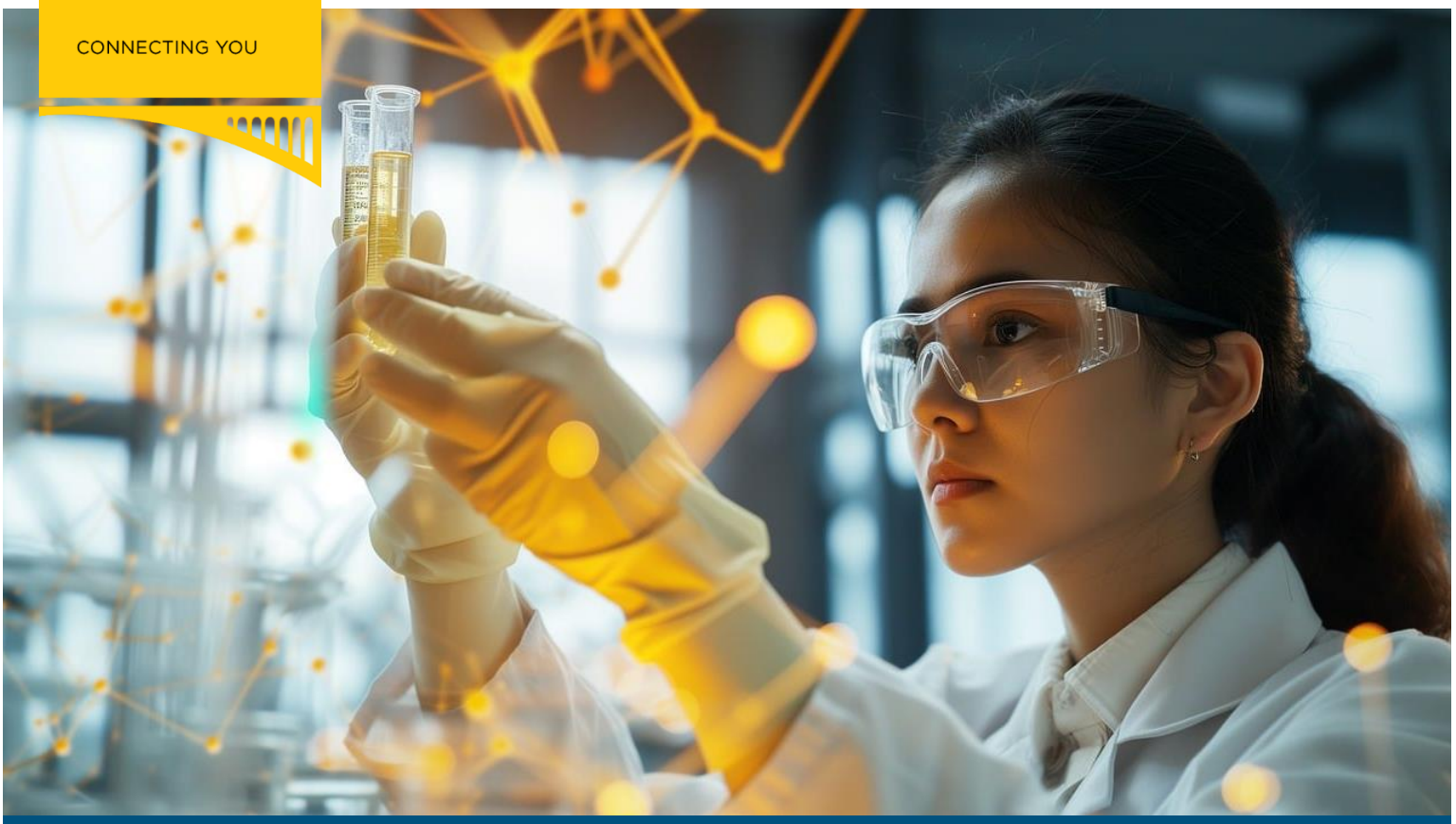
CiSA CoMH interdisciplinary Seed Awards



CiSA Impact Report Highlights: 2021-2022

May 2024

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Foreword: Professor Helen Whelton, Head of the College of Medicine and Health, University College Cork.

As Head of the College of Medicine and Health (CoMH) I am proud to present the College of Medicine and Health interdisciplinary Seed Awards (CiSA) Supporter Impact Report. This report offers a window into the multidisciplinary research being carried out at University College Cork and the direct correlation with improving patient outcomes. Research impact takes many years to unfold, and in this publication, we highlight the early and immediate outcomes of projects made possible through the 2021 CiSA Awards. These initial impacts will undoubtedly be augmented as researchers build on their findings and pursue larger grants. Some of the impressive medium-term impacts are evident in the testimonials provided by earlier awardees.

I would also like to take this opportunity to express my sincere gratitude to each of our partners for the steadfast support of our research endeavours. It is the spirit of philanthropy that paved the way for us to establish the CiSA seed funding awards back in 2019 and since then, the CiSA Awards have been a catalyst for forging both clinical and non-clinical research collaborations. Over the past four years, seed funding has been allocated to the enhancement of patient-focused research and the development of new research areas. These modest investments have facilitated the development and piloting of new ideas and approaches to a point where more extensive grant applications have been made where needed and warranted. The CiSA Awards have undoubtedly addressed critical knowledge gaps and positively impacted the lives of patients through translational research, the dissemination of knowledge, issuing relevant publications, and ultimately impacting policy and strategy development.

Delivering positive patient benefits continues to be a key driver of the CoMH research strategy, and with this in mind, the UCC Academic Health Sciences (AHS) was formed in 2022. The UCC AHS works in tandem with the CoMH health sciences schools to provide a formal channel for cooperation with its affiliated health partners. This includes developing and implementing the strategic vision and direction for healthcare education, research, and innovation across UCC and South-SouthWest Hospital Group (SSWHG), and ultimately the successful creation of an Academic Health Science System in the South/SouthWest region. This in turn is contributing to the development of a national academic health sciences system strategy.

Thanks to the ongoing generosity of our partners, we are delighted to announce the continuation of our seed funding awards programme in 2024. However, in recognition of the critical importance of the recently formed AHS the awards will be renamed from CiSA to the **AHS Awards.** Regardless of the name, we anticipate an array of groundbreaking research that will significantly benefit the healthcare sector in Ireland and enhance the quality of life for patients.

We look forward to embarking on a new journey of discovery and innovation together.

Professor Helen Whelton
Head of College of Medicine and Health

CiSA Funding Impact Highlights 2021-2022

RESEARCH FINDINGS SHARED GLOBALLY

7 publications in esteemed international medical journals - and others in progress. **10** presentations disseminating research findings to date. Advancing knowledge exchange both nationally and internationally for patient benefit. **2** prizes from the Irish Association of Oral Surgery and The Irish Society of Medical Oncology.

IMPACTED POLICY DEVELOPMENT

Research findings impacted the Medical Research Council (MRC) Framework for intervention and testing for palliative care referral processes.

GRANT APPLICATIONS

As a direct result of the CiSA Seed Funding grant applications have been made by each of the awardee groups and further funding in support of specific research has been secured.

LEVERAGED FUNDING

Funding was leveraged from the Irish Haemostasis Research Fund to support the dissemination of research both nationally and internationally.

PIONEERING RESEARCH IN IRELAND

The first study of its kind in Ireland to explore the oral health status and dental needs of oncology patients planned for bone modifying agent (BMA) therapy was achieved.

Projects:

PROJECT 1. THE COMMUNICATION EXPERIENCES OF PATIENTS AND CARERS REFERRED TO SPECIALIST PALLIATIVE CARE SERVICES AT MARYMOUNT UNIVERSITY HOSPITAL AND HOSPICE: A QUALITATIVE EXPLORATION

Background	Multiple studies of palliative care (PC) programs in different countries and health care systems show that early referral to specialist PC is associated with improved patient outcomes, including symptom control, quality of life, and caregiver outcomes, such as reduced stress and dysfunctional grief. However, timely referral to specialist PC remains problematic, and most patients are still referred too late. There are many well-documented reasons for referrer reluctance to refer to PC early including a fear of upsetting patients, seeing referral as an admission of failure, and not understanding the benefits of early referral. The aim of this study was to explore the experiences of patients and carers referred to specialist PC: • To better understand the challenges, barriers, and facilitators to early specialist PC referral. • To identify strategies to improve communication experiences during specialist PC referral. • To guide the development of a supportive communication framework for healthcare professionals to ensure seamless early referral to the specialty.
Results and Conclusion	Qualitative interviews were conducted with 17 participants (10 persons receiving palliative care and seven carers) and analysed thematically. Four themes were identified: (i) The why, who, what, when, where, and how of palliative care referral; (ii) initial thoughts and feelings about referral to palliative care; (iii) enhancing the communication of palliative care referral; and (iv) addressing practical needs during palliative care referral. Participants were referred either through their general practitioner or oncologist. Initially, participants linked palliative care referral to death. This perception changed when participants started availing of the services. Compassion, empathy, hope, privacy, in-person communication, individualised referral, and information dosing were identified as building blocks for effective communication. Participants stressed the importance of raising public awareness of palliative care and addressing the practical needs of individuals being referred. In conclusion, the communication of palliative care referral should be tailored to meet the individual needs of patients and carers. Considering the continuing misconceptions around palliative care, delivering clear and simple information is important to ensure that patients and carers understand and accept the referral.
Impacts and Publications	**Patient impact:** The project represented an important step in the Medical Research Council (MRC) Framework for intervention development and testing. It will help the team design a communication framework and targeted intervention to enhance referral processes for patients and carers in the future. **Local impact:** This was an interdisciplinary project that worked successfully and will now pave the way for future research collaborations in this area. **National impact:** The HSE Palliative Care Development Framework recommends that specialist palliative care services should be available to all patients, wherever they are, and whatever their disease. Such services require a partnership approach. This research will help to address this objective. **Wider impact:** The team disseminated the learning from the research project widely to amplify the impact of the findings. This was achieved by giving presentations to key stakeholders, producing open-access publications, and

	presenting results at national and international conferences. A list of presentations and publications to date is listed hereunder: • A publication from the project is currently under review in the journal "Supportive and Palliative Care." • A second publication from the project is in preparation for submission to a peer-reviewed journal. • An invited talk titled "The Communication Experiences of Individuals Referred to Specialist Palliative Care Services and Their Carers: A Qualitative Exploration" given to students in the Palliative Care and Ethics Society on March 19th, 2024, at University College Cork, Cork, Ireland. • An oral presentation titled "The communication experiences of persons referred to specialist palliative care services and their carers: A descriptive phenomenological study" was presented at the International Conference 'Reflections and Projections', hosted by Marymount University Hospital & Hospice on October 12th and 13th 2023, at Pairc Uí Caoimh, Cork, Ireland. • An oral presentation titled: "The communication experiences of patients and family members referred to specialist palliative care services: A qualitative exploration" was presented at the 21st International and Interdisciplinary Conference on Communication, Medicine, and Ethics (COMET) on June 20th to 22nd 2023, at University College Cork, Cork, Ireland.
Leveraged Funding	• Dr Saab and Dr Kiely are both collaborators on In-Touch: Implementation of a person-centered palliative care iNtervention To imprOve comfort, QUality of Life and social engagement of people with advanced dementia in Care Homes. This project is Horizon Europe-funded to the value of €7,500,000 for a duration of 60 months (2024-2028). It includes 9 interlinked work packages and 13 international partners. • Dr Saab is leading a work package from a recently funded project aimed at using virtual reality to educate nursing and medical students about difficult communication and breaking bad news, including referral to palliative care (Erasmus+ funded, €400,000, 2023-2025). The work package that Dr Saab is leading involves testing the feasibility, usability, and acceptability of the virtual reality scenarios with over 200 nursing and medical students and educators in Ireland, Germany, The Netherlands, Portugal, and Czech Republic.
Team Members	Dr Mohamad Saab, Senior Lecturer and Director of Graduate Studies, Catherine McAuley School of Nursing and Midwifery, University College Cork, Dr Fiona Kiely, Consultant Palliative Medicine, Marymount University Hospital and Hospice & Cork University Hospital, Prof Josephine Hegarty, Chair and Professor of Nursing, Catherine McAuley School of Nursing and Midwifery, University College Cork, Dr Mary Jane O'Leary, Consultant Palliative Medicine, Marymount University Hospital and Hospice & Cork University Hospital.

Early referral to specialist Palliative Care is associated with improved patient outcomes, including symptom control, quality of life, and caregiver outcomes.

PROJECT 2. ASSESSMENT OF AUGMENTED SYSTEMIC RESPONSES BY THE GUT MICROBIOME ELICITED BY LIVER-DIRECTED NEOPLASIA TREATMENT

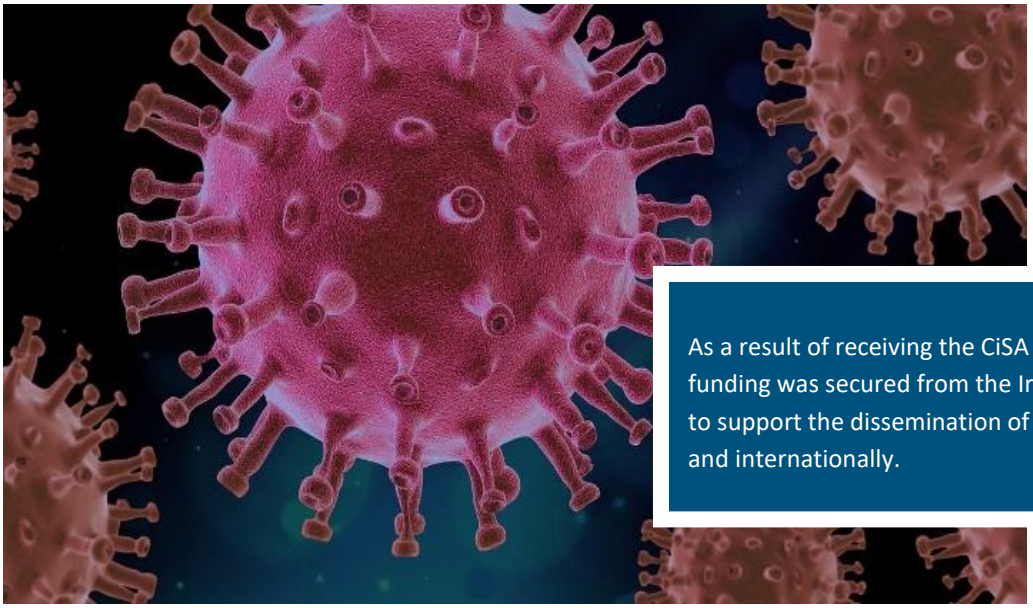
Background	Post-ablation/Embolization Syndrome (PES) is poorly understood and relatively unexplored. The iatrogenic phenomenon occurs following ablation (thermal) & embolisation treatments which entail organ injury. Patients suffer from fever, myalgia, nausea, vomiting, and fatigue. An incidence of 40-50% increased pain and interference with work and general activities compared with patients who did not develop the condition. This project aimed to elucidate the causality of post-ablation syndrome following organ-targeted ablation and embolisation procedures and to assess treatment methods. This study will also aid in the identification of mechanisms responsible for the development of this syndrome and will provide insights and potential therapeutic targets.
Results and Conclusion	The results demonstrated higher levels of PES in patients (~70%) than had been previously described in the literature. There were lower baseline levels of inflammatory markers in patients who experienced PES compared with controls however there was a significant increase in inflammatory markers flowing embolisation along with symptom development in the PES cohort which could suggest a greater physiological sensitivity to increase in marker concentrations after the procedure compared to the controls. Within the group of patients that experienced PES, there were two subgroups, with one group with higher inflammatory markers (CRP, IFNγ, IL-2, IL-12p70, TNFα), that appear to correlate with the development of chronic pelvic pain experienced by these patients. Furthermore, both plasma and fecalase from the patients with PES activated myenteric calretinin positive neurons which are sensory in nature and involved in the innervation of the pelvic viscera. These neuronal populations are associated with pain pathways, and we further demonstrated that estrogen receptors were located on 84% of these neurons, which could indicate a role for estrogen in pain experienced by our patient cohort post embolisation.
Impact and Publications	Two publications and three funding applications to date. **Publications:** • Waldron MG, Kassamani YW, O'Mahony AT, O'Mahony SM, O'Sullivan OE, Power SP, Spence L, Maher MM, O'Connor OJ, Buckley MM. Uterine Artery Embolisation of Fibroids and the Phenomenon of Post-Embolisation Syndrome: A Systematic Review. Diagnostics (Basel). 2022 Nov 23;12(12):2916. doi: 10.3390/diagnostics12122916. PMID: 36552922; PMCID: PMC9776929. • In preparation: Uterine Fibroids and the Microbiome. Kassamani YW, Twomey M, Collins L, O' Regan P, Waldron MG, O'Mahony AT, O' Sullivan O, Power SP, Spence L, Maher MM, O'Connor OJ, Buckley MM.
Leveraged Funding	**Funding applications:** • HRB ILP 2022: shortlisted but unsuccessful. • GOIPG 2023: unsuccessful. • HRB ILP 2024: awaiting the outcome.

Additional Project Information	In the development of this study to investigate the effects of embolisation/ablation procedure, it emerged that patients undergoing hepatic ablation/embolisation had a large number of co-morbidities including malignancies that would significantly impact the findings of the study. The team discussed this and subsequently, we recruited patients that were undergoing uterine artery embolisation for benign uterine fibroids. This allowed us to gather data from a homologous group with no co-morbidities and clear findings that could be directly attributed to PES.
Team Members	Dr Maria M Buckley, Department of Pharmacology & Therapeutics, UCC, Dr Owen J O'Connor, Department of Radiology, UCC, Professor Michael Maher, Department of Radiology, UCC, Dr Stephan Power, Department of Radiology, UCC, Orfhlaith O'Sullivan, Department of Obstetrics and Gynaecology, CUMH, Liam Spence, Department of Radiology, UCC. Dr Eva Long, Consultant Nephrologist, Department of Renal Medicine, Cork University Hospital

PROJECT 3. TO INVESTIGATE THE INDUCTION OF MONOCYTE PROCOAGULANT ACTIVITY BY SARS-COV-2 AS A POSSIBLE CONTRIBUTOR TO THE INCREASED RISK OF THROMBOEMBOLISM OBSERVED IN COVID-19

Background	COVID-19 remains a worldwide health emergency. As of **May 2024**, there have been **775 million confirmed cases**, including **7 million deaths reported to World Health Organization – which are a gross underestimation of the true burden of disease worldwide.** Hypercoagulability is a poor prognosticator of COVID-19. Tissue factor is the key potentiator of hypercoagulable states, monocytes are the predominant source of blood-borne tissue factor. Aberrant tissue factor expression has been linked to COVID-19.
Results and Conclusion	As a result of the CiSA Award, this team identified novel mechanisms of cell-based procoagulant activity triggered by SARS-CoV -2. The CiSA Award supported preliminary investigations of cell-based procoagulant activity in vitro, which has leveraged further investigations using human-derived components. Furthermore, the CiSA Award has supported research dissemination and knowledge exchange both nationally and internationally.
Impacts and publications:	Three publications – in esteemed journals or in preparation for submission – and three presentations. **Publications:** • Harte, J.V., Coleman-Vaughan, C., Crowley, M.P., and Mykytiv, V. (2023) 'It's in the blood: a review of the hematological system in SARS-CoV-2-associated COVID-19', Critical Reviews in Clinical Laboratory Sciences, 0(0), 1–30, available: https://doi.org/10.1080/10408363.2023.2232010. • Harte, J.V., Coleman-Vaughan, C., Crowley, M.P., McCarthy, J. V., and Mykytiv, V. (in preparation for submission) 'SARS-CoV-2 Induces Increased Cell-Based Tissue Factor-Factor VIIa-Dependent Procoagulant Activity in Human-Derived Cell Lines.' • Harte, J.V., Coleman-Vaughan, C., Crowley, M.P., McCarthy, J. V., and Mykytiv, V. (in finalisation) 'Monocytes and Macrophages Promote Increased Tissue Factor/Factor VIIa-Dependent Procoagulant Activity in Response to the SARS-CoV-2 Spike Protein.' **Conference Presentation:** • Oral Presentation – Harte, J. V., 'Monocytes and Macrophages Promote Increased Tissue Factor/Factor VIIa-Dependent Procoagulant Activity in Response to the SARS-CoV-2 Spike Protein,' International Society for Thrombosis and Haemostasis (ISTH) Congress in Montréal (June 2023). • Poster Presentation – Harte, J.V., Coleman-Vaughan, C., Crowley, M.P., McCarthy, J. V., and Mykytiv, V., 'Monocytes and Macrophages Promote Increased Tissue Factor/Factor VIIa-Dependent Procoagulant Activity

	in Response to the SARS-CoV-2 Spike Protein,' College of Medicine and Health Future Research Conference (September 2023). • Poster Presentation – Harte, J.V., Coleman-Vaughan, C., Crowley, M.P., McCarthy, J. V., and Mykytiv, V., 'Monocytes and Macrophages Promote Increased Tissue Factor/Factor VIIa-Dependent Procoagulant Activity in Response to the SARS-CoV-2 Spike Protein,' ORBioM Conference (November 2023).
Leveraged Funding	Funding was leveraged from the Irish Haemostasis Research Fund to support the dissemination of the research both nationally and internationally, and grant applications are currently in progress to leverage postdoctoral funding to continue the research initiated through the CiSA Award.
Team Members	Mr. James V. Harte, PhD Candidate, School of Biochemistry and Cell Biology, University College Cork, Ireland and Medical Scientist, Department of Haematology, Cork University Hospital, Ireland; Dr. Maeve P. Crowley, Consultant Haematologist, Department of Haematology, Cork University Hospital, Ireland; Prof. Justin V. McCarthy, Head of School, School of Biochemistry and Cell Biology, University College Cork, Ireland; and, Dr. Vitaliy Mykytiv, Consultant Haematologist, Department of Haematology, Cork University Hospital, Ireland.



As a result of receiving the CiSA Seed Funding Award further funding was secured from the Irish Haemostasis Research Fund to support the dissemination of this research both nationally and internationally.

PROJECT 4: ORAL HEALTH STATUS AND DENTAL CARE NEEDS OF ONCOLOGY PATIENTS PRIOR TO BONE MODIFYING AGENTS (BMAS)

Background	Bone modifying agents (BMAs) are an integral component of cancer care. Their utilisation is paramount to the management of skeletal related events (SLEs) in metastatic disease. BMA therapy improves quality of life and survival for patients and helps reduce the burden of healthcare expenditure. Breast cancer was the most common cancer diagnosis in 2022 (13.8%), followed by colorectal (13%), prostate cancer (12.1%) and lung cancer (11.6%). Unfortunately, BMA treatment subjects patients to the risk of developing medication-related osteonecrosis of the jaw (MRONJ). The prevalence of MRONJ in the metastatic cohort ranges from 0 – 12%. Dental decay is an integral risk for MRONJ and is the most common, untreated non-communicable disease according to the World Health Organisation. This trend has shown no improvement over the past 30 years ,affecting 3.5 billon people world-wide. The prevalence of dental disease is indicative of future MRONJ.
Aims	• Define the oral health status and • Dental care treatment needs of oncology patients planned for a BMA This was a mixed methods study conducted in 2 phases. In Phase 1, patients were recruited from the oncology clinics in the Cork University Hospital (CUH), South Infirmary Victoria University Hospital (SIVUH) and Mercy University Hospital (MUH). Phase 2 included qualitative interviews with general dental practitioners and oncology patients.
Results and Conclusion	In Phase 1, a total of 150 patients were assessed and treated prior to a BMA. The mean DMFT was 17.68 (SD 7.85) and 145 (97%) had periodontal disease. 86 restorations were placed and 188 teeth were extracted over the course of treatments. Multivariate analysis revealed a significant result for a periodontal extraction and increasing age, which increased by 21.2% every 10 years (p=0.0239). Patients who did not have a GDP were twice as likely to require dental restorations (OR=2.122) and required 67.5% more restorations. Patients that attended on an irregular (every 2-4 years) were 2.5 times and rare (5 years or more) basis were 3.4 times as likely to require an extraction compared to frequent attenders (OR=2.5 and OR=3.407), respectively. A current smoker was 3.4 times as likely to require an extraction, particularly due to periodontal disease (p<0.001). In Phase 2, 10 patients and 20 dentists were included in qualitative interviews. Multiple themes emerged amongst dentists, including the difficulties of treatment planning for oncology patients planned for or receiving BMA, lack of guidance criteria to assist treatment planning, poor knowledge of medication-related osteonecrosis of the jaw (MRONJ) amongst general medical practitioners (GMPs), and management of these patients in the emergency setting. Patients expressed concerns about the additional burden of dental care, their lack of knowledge of MRONJ prior to their dental assessment, and the reassurance of a multidisciplinary co-ordinated dental service. The current model of oral health delivery known commonly as the westernised model of modern dentistry does not meet oral health needs globally, which is an unsustainable model to correct rising oral disease figures. The study highlights the requirement for integration of oncodental services in routine cancer care. The burden of dental disease and the requirement for significant dental treatment was evident in this cohort of oncology patients.
Impacts, Prizes, and Publications	The project team achieved four conference presentations, two prizes, and an esteemed publication. **Conference presentations** 1. **Irish Society of Medical Oncology (ISMO), January 2023.** “No MRONJ, No Problem?” - Oral presentation. 2. **Irish Association of Oral Surgery (IAOS), March 2023.** “The dental oncology complication that wouldn’t go away” – Poster presentation.

3. **Irish Head and Neck Society Annual Meeting, May 2023.**
   "The dental oncology complication that wouldn't go away" – Poster presentation.

4. **European Society of Medical Oncology (ESMO), Madrid October 2023.**
   "The impact of a dental oncology clinic for patients prescribed bone modifying agents in a cancer centre" – Poster presentation.

Prizes
ISMO Bursary Award, January 2023 – 1st prize Oral Presentation
IAOS Bursary Award, March 2023 – 1st prize Case-based Poster Presentation

Publications

- **The dental oncology complication that wouldn't go away.**
  Byrne H, Weadick C, Ni Riordain R, Barry C, O Reilly S. Archives of Breast Cancer. 2023;10(3).

Articles under current review:

- **How we manage Medication-Related Osteonecrosis of the Jaw**
  Byrne H, O'Reilly S, Weadick CS, Ni Ríordáin R.
  European Journal of Medical Research (Submission May 2023)

- **Bridging the gap – establishing a dental-oncology service in a cancer centre.**
  Byrne H, Curtin C, Weadick CS, Ní Riordáin, O'Reilly S.
  European Journal of Cancer Care (Submission April 2024)

Team Members

Dr R Ní Riordáin, Professor S O Reilly, Dr H Byrne, Cork University Dental School and Hospital, Cork University Hospital

This was the first study to explore the oral health status and dental health needs of oncology patients planned for BMA therapy in the Republic of Ireland.

Previous Awardee Testimonials

Maria O'Shea and Claire Hayes

PROJECT TITLE: QUALITATIVE EVALUATION OF A PAEDIATRIC HAEMATOLOGY ONCOLOGY OUTREACH SERVICE AT MERCY UNIVERSITY HOSPITAL
FUNDING YEAR: 2019-2020

Testimonial	"The CiSA seed funding helped us to forge relationships with clinical colleagues; to document the unmeasured and to recognise the ingenuity and impact of advanced nurse practice in the day-to-day home care of children with cancer. The funding highlighted this practice initiative and identified the positive outcomes, enhanced efficiency this outreach service has on the lives of the children and families with a cancer diagnosis. The true value of this service will only be exposed by undertaking a comparison study with a similar cohort who do not have an outreach programme. The seed funding had been instrumental in taking this research through the first stage. The next stage would be to undertake the comparison study, which we hope the results of which would serve to inform a national roll out of a paediatric oncology outreach programme. This research has been a stepping stone for further nursing research in the area of child oncology. **It's a testament to the power of seed funding in fostering innovation and driving positive change in healthcare**"

Dr Frances Shiely

PROJECT TITLE: THE CHALLENGES OF RECRUITMENT TO A RANDOMISED TRIAL REGISTRY – WHAT INFORMATION MATTERS TO THE PATIENT
FUNDING YEAR: 2019-2020

Testimonial	"The long-term impact of the CiSA award extends well beyond its initial scope, fostering career development, expanding collaborative networks, advancing institutional recognition, and driving continuous innovation in trial methodology. Building on the success of the initial project, further successful large grants from the HRB, the EU, and SFI have led to UCC being recognised as a leader in the field of trial methodology research and further enabling links with international experts in the field, e.g., Prof. Gordon Guyatt, Dr David Moher, Prof. Shaun Treweek, to name but a few. By prioritising patient perspectives and fostering interdisciplinary collaboration, our work has shaped the landscape of clinical trials methodology, **with lasting implications for patient care and scientific advancement**."

Dr Martina Hayes

PROJECT TITLE: ORAL HEALTH OF ADULTS WITH CYSTIC FIBROSIS
FUNDING YEAR: 2019-2020

Testimonial	"**Being a CiSA recipient was instrumental in leveraging over €250,000 in additional funding from charity partners and national funders**. As a result, we in UCC and in the Adult Cystic Fibrosis unit in Cork University Hospital, conducted the largest ever clinical study on the oral health of people with CF. Our results have been shared with the Cystic Fibrosis community worldwide as well as the medical, dental and allied healthcare professionals who provide care to them. We have formed collaborations with colleagues in Seattle and Melbourne to explore securing additional funding for a multi-centre expansion and we look forward to continuing our relationship with Cystic Fibrosis Ireland"

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Thank you to all our sponsors for their generous support.

The projects you have kindly funded in the past have gone on to influence national health policy, others have leveraged large grant funding, and all have published papers.

The projects that will be selected for support in the year ahead will undoubtedly have huge potential to improve health care and the quality of life of patients.

With your generous support, we can continue to work for patient benefit and first-class care.

For more information, contact:

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College of Medicine and Health
University College Cork