

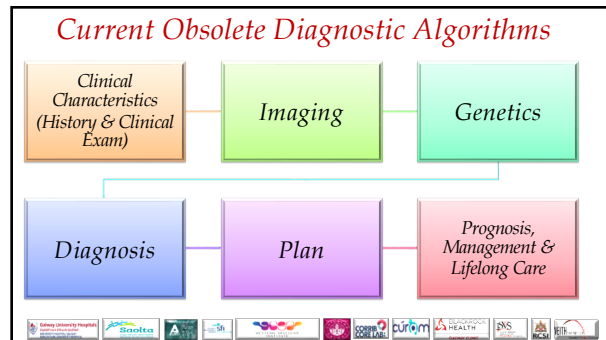
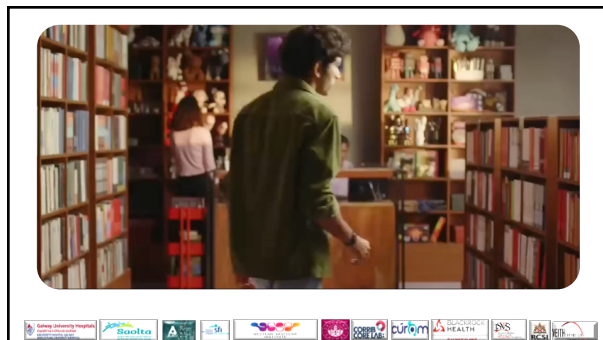
*Revolutionizing Vascular Surgery
Navigating AI & Multiomics Frontiers For Precision
Care Advantages & Limitations
"The Vasc-Omic" Disruptive Technology*

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Disclosure

- Founder of Tulip Endovascular Innovation , Ireland
- Founder of Embricon Endovascular ,Ireland
- Founder of Green Medical, Michigan, USA
- Research Education Grants :
 - Cordis , Medtronic, Endologix, Gore, Vascular Solutions
 - BMS, MSD, AstraZeneca , Abbot, AOTI
 - Sanofi-Aventis, Pfizer, Ulbrich, Bolton Medical
 - SFI, EI, NSAI, HRB, Cryolife, JoTec, Artivion



❖ *Vasc-Omics Integrated Techniques Mandate New Ontological Biological Approaches for Cardiovascular Disease*

❖ *The Lure of Obtaining Large Datasets Will Replace Any Clinical Trials & Investigators Must Understand Technical & Biological Strengths of Vasc-Omics Approaches*

Radiation Levels are Currently Dangerous

Modern Imaging Technology Should Be Considered A Top Priority in Every Centre Providing Endovascular Management of Aortic Pathology in Order To Attract Trainees & Educated Patients

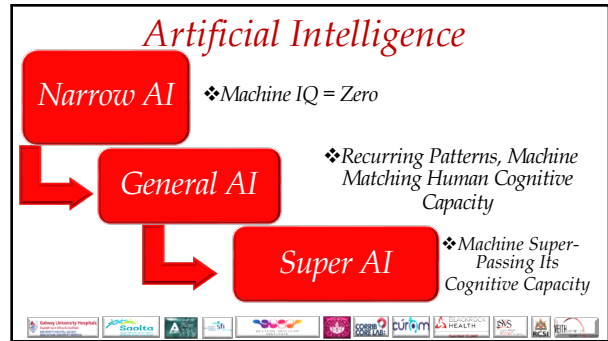
F/BEVAR Carries the Greatest Exposure

Use of surgical augmented intelligence maps can reduce radiation and improve safety in the endovascular treatment of complex aortic aneurysms

Robert J. Peckol^{1,2}, Jonathan M. Lee^{1,2}, Justin H. Harkness^{1,2}, Justin B. Lamer^{1,2}, Andrew R. Buckenham^{1,2}, Adamson B. Mackinnon^{1,2}

	AI Used	AI Not Used	P Value		Coefficient*	95% CI	P Value
Operative Time	256.2 ± 311.2	330.0 ± 150.0	0.016	Operative Time	-73.4	-120.7, -26.1	0.003
Contrast	101.1 ± 44.1	226.0 ± 85.8	<0.0001	Contrast	-126.6	-147.1, -106.0	<0.0001
Radiation Exposure	2819.8 ± 1691.9	4749.3 ± 3795.7	0.031	Radiation Exposure	-2182.1	-2934.5, -1429.7	<0.0001
Fluoroscopy Time	71.8 ± 34.5	107.4 ± 65.7	0.008	Fluoroscopy Time	-37.5	-53.8, 21.2	<0.0001

Individuals Who Underwent A Procedure With Augmented Intelligence Had Superior Outcome Than Those Who Had Procedures Without Augmented Intelligence



Super AI & Quantum Computing in Translational Medicine

Transformative Advancements in Vascular Clinical Practice

- ❖ **VASC-Omics Identifies Resilient Vascular Trainee**, Accelerates Discovery of Trainee Vascular Phenotypes That Withstand High Radiation Exposure
- ❖ **AAA Sac Volume Mapping Enhances Predictive Modelling & Personalized Treatment Strategies As It Guides Interventions Based On Sac Expansion As A Surrogate Endpoint**
- ❖ **Dynamic Fusion Imaging** as it Reduces Intraoperative Radiation, Intervention Duration & Contrast Use

AI-Powered Multi-Omics Analysis for Personalised Decision-Making

Radomics is Optimizing Cardiovascular Imaging Measurements & How The Results of These Measurements Can Be Read & Utilised

"Imaging + Biological Datasets = Radio-Gen-Omics=Vasc-Omics"

Vasc-Omics in Vascular Care

- ❖ Predict Disease Risk Using Tools Like XGBoost & SHAP
- ❖ Guides Patient Care On Precision Risk Profiles

Vasc-Omics in PAD & EVAR Sac Behaviour

Vasc-Omics Identified Atherogenic Pathway & Created Therapeutic Targets To Address AAA & PAD, With CRISPER & Gene Editing

Integrating Vasc-Omics into Vascular Training

- ❖ Leveraging Advanced Genetic Screening To Identify RNA-Resilient Candidates Against Radiation, Ensuring Safer Selection Of Vascular Trainees
- ❖ This Innovative Approach Prioritizes Radiation Resistance, Future Vascular Surgeons , Minimizing Long-term Health Risks & Mitigating Medicolegal Liabilities While Redefining Safety Standards In Vascular Medicine

Professional Fees Doesn't Equate For Life-Long Risk of Radiation Exposure For Physicians , Hospitals & Patients

Gut Microbial Taxonomy in Aortic Diseases

- ❖ Significant Diversity & Abundance of Gut Microbiota Taxa Are Observed In Takayasu's Arteritis, Giant Cell Arteritis, Aortic Aneurysms, And Aortic Dissection, With Greater Dysbiosis Compared To Healthy Control Groups
- ❖ Beyond Traditional Interventions Like Faecal Transplantation, Probiotics & Dietary Changes Vasc-Omics Will Enable Precise Modulation of Gut Microbiota
- ❖ Primary Outcomes Aim To Prevent Or Halt The Progression of Aortic Diseases

CYDAR Revolutionizing Precision in AAA Management

- ❖ Dynamic Volume-based Insights as it Tracks Sac Volume Changes & Behaviour Over Time, Delivering Critical, Objective Insights Into Progression & Treatment Efficacy
- ❖ Data-driven Decision Making, Reduces Reliance On Subjective MDT Consensus By Employing Predictive Analytics For Conflict-free, Evidence-based Outcomes

Avoiding Stroke in Complex Arch Procedures

Intelligent Smart Fusion Imaging

Avoiding Stroke in Patients Undergoing Endovascular Aortic Arch Repair

... [text] ...

Preoperative Management to Mitigate Stroke Risk

Preoperative

- 1. Identify and address potential stroke risk factors.
- 2. Assess conditions of support arch branches on CTA or MRA of neck and head.
- 3. If applicable, assess the time of cerebral autoregulation if applicable.
- 4. Obtain preoperative cerebral angiogram if applicable or possible.
- 5. Consider the CTA timing and quality of contrast timing and quality.
- 6. Consider the CTA timing and quality of contrast timing and quality.

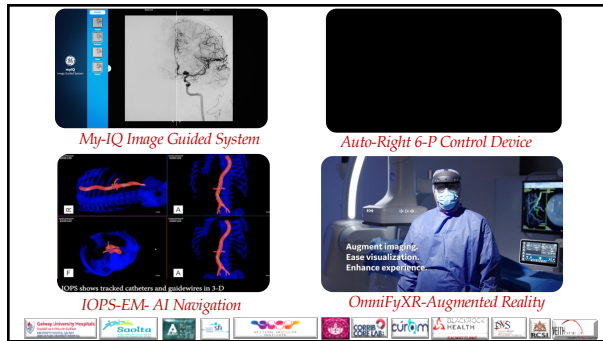
Intraoperative

- 1. Consider preoperative management to maintain an antegrade flow of blood.
- 2. Apply embolic protection device (EPD) if applicable or possible.
- 3. Use CTA or MRA to identify areas of high risk for stroke.
- 4. Consider the use of cerebral protection to minimize embolic risk.
- 5. Avoid retrograde cerebral access for the reconstruction of the aortic arch, if applicable.
- 6. Consider the CTA timing and quality of contrast timing and quality.
- 7. Consider the CTA timing and quality of contrast timing and quality.

Postoperative

- 1. Consider the use of cerebral protection to minimize embolic risk.
- 2. Consider the use of cerebral protection to minimize embolic risk.

Allia GE AI-ML Fusion Imaging



*Revolutionizing Vascular Medicine
Through Vasc-Omics*

- ❖ *Transforming Antiquated Medical Education Through AI & Big Data Analytics, Both Will Set To Pioneer A New Era in Precision Medicine, Redefining Vascular Disease Management*
- ❖ *Futureproofing of Vascular Surgery by Building A Resilient Workforce Equipped With Advanced Scientific Insights & Predictive Tools To Address Modern Challenges With Confidence*

Vasc-Omics & How The Future Vascular Surgeons Will Be Chosen By AI & Machine Learning

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