Industry Academia Collaborations
Barry McMahon Tallaght Hospital and Trinity College Dublin
Medical Technology in Healthcare – The Ecosystem

- Medical Device Industry
- Academia
- Practitioners
- Healthcare System

Medical Technology in Healthcare
Getting Good Science to Patients
The Focus In Medical Research

- Heart Disease
- Cancer
- Immunology
- Neurosciences
- Molecular Medicine
- Genomics

Bench

Understanding Functional Aspects to Disease

Bedside

Precision Medicine at the Point of Care

Drugs

Medical Devices

Medical Technology
Objective

*Engaging Clinicians & Other Healthcare Professionals in Technology Innovation at the Bedside*
Interdisciplinary Engagement at Early Stage

Lost in Translation

Scientist/Engineer

Busy doctor
Along with nearly 20 million Americans, I have gastroesophageal reflux disease (GERD). I was diagnosed with it about eight years ago.
Prevalence

ICEBERG View

Chronic persistent Sx and complications

Frequent Sx often seen by M.D.

Mild recurring Sx not seen by M.D.

25% in Western Populations

7% Daily Severe Events

Studies show patients with Reflux Disease have a lower Quality of Life compared to those with Chronic Heart Disease.

$9 Billion per annum to control disease in U.S.
The Oesophago-gastric Junction
TreatmentS Pharmacological

Proton Pump Inhibitor

- Insufficient Acid Clearance
- Abnormal Inter-Abdominal Pressure
- Dysfunction of The LES
- Over production of Acid
- Delayed Gastric Emptying

SALIVA NEUTRALIZES REMAINING ACID REFLUX IN ESOPHAGUS
TreatmentS Surgical

Laparoscopic Nissen Fundoplication
TreatmentS Endoscopic Therapy

Endoscopic Suturing

RF Delivery

Clip Insertion

Insertion of Prosthesis
Suturing the Oesophagogastric Junction Endoscopically
Endocinch therapy for gastro-oesophageal reflux disease: a one year prospective follow up

Z Mahmood, B P McMahon, Q Arfin, P J Byrne, J V Reynolds, E M Murphy, D G Weir

**Background:** Gastro-oesophageal reflux disease (GORD) is, in the main, treated with either proton pump inhibitor (PPI) drugs or a Nissen fundoplication operation. Recently, BARD developed Endocinch, a device used to place sutures just below the oesophagogastric junction (OGJ) to treat GORD.

**Aim:** To evaluate the long term benefit of the Endocinch technique post procedure.

**Patients:** Twenty six patients with symptoms of GORD were performed. Four patients were lost to follow up.

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**Symptom scoring normalised to percentage**

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<th>p Value</th>
<th>n</th>
<th><strong>Baseline</strong></th>
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<th>6 month</th>
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<td></td>
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Note: The box plots show the distribution of symptom scores over time.
Do we really understand the role of the oesophagogastric junction in disease?

Barry P McMahon, Blair A Jobe, John E Pandolfino, Hans Gregersen

Figure 5 Diagram showing the difference between manometry and cross-sectional area (CSA) for measuring luminal changes in the oesophagogastric junction during opening and closing. At point A where the junction is closed, there is a high pressure and a low CSA representing the toned sphincteric region. As the sphincter relaxes, very quickly the manometry catheter is no longer squeezed, and at point B the pressure is zero or very low. However, this opening is detected by an increase in CSA at B. At C the sphincter is fully relaxed; but, there is still no useful information from manometry despite the CSA increasing even further. The pressure does not start to rise again until the sphincter is fully closed and toned at E.
2003-2005 Work in Denmark
Geometric Reconstruction
Patient with Achalasia (Denmark)
Bag volume is controlled

16 CSAs & Intra-bag Pressure are Measured

Bag Volume

The System

Crospon Ltd, Galway, Ireland
Improving functional esophageal surgery with a “smart” bougie: endoflip

Silvana Perretta · Bernard Dallemagne · Barry McMahon · Jacopo D’Agostino · Jacques Marescaux

Smart bougie for calibration

An emerging physiology tool, the functional lumen imaging probe (Endoflip, Crospon Ltd.), combines measurements of esophagogastric junction (EGJ) resistance to distention and provides a geometrical reconstruction of the EGJ [84]. The Endoflip could be used to dynamically assess the configuration and quality of the fundoplication with respect to the EGJ, acting as a “smart bougie” evaluating laxity, orientation, and position of a properly constructed floppy Nissen fundoplication (Fig. 4).
Pre & Post Lap Nissen

(VOLUME WAS 30 ml)

Vest 1.78 ml (25 mm)
2010:01:13-10:19:26

Vest 0.89 ml (25 mm)
2010:01:13-12:53:55
Successful Technology

Trinity College Dublin, The University of Dublin
Research to Innovation

Normal Route
- Education → Research → Innovation

My Route
- Innovation → Research → Education
Innovation at the Hospital

European Institute of Innovation & Technology
HEALTH SUMMER SCHOOL
Presented by
Tallaght Hospital,
The Innovation Academy,
School of Medicine TCD,
& Trinitas Ventures

LIVE INNOVATION WORKSHOP
NOVEL CINCHING DEVICE FOR THE
ENDOSCOPIC TREATMENT FOR OBESITY

1. Introduction and Welcome CEO/CEO (9 mins)
2. Collaborative Innovation at the Frontline of Medicine - Dr. Barry McKahan (9 mins)
3. The Clinical Problem - Prof. Deirdre McNamara (9 mins)
4. Applying a New Technology - Working Towards a Practical Solution - Dr. Jim Coleman (9 mins)
Break (9 mins)
5. LIVE TESTING OF PROTOTYPE (90-120 mins)
6. Q&A Session

Wednesday 8th July 2pm to 4pm
Venue: Trinity Lecture Theatre, Trinity Centre for Health Sciences, Tallaght Hospital
Innovation to Research

Documents by year

Source: Scopus.com
Innovation to Research

Documents by author
Compare the document counts for up to 15 authors

- Gregersen, H.
- McMahon, B.P.
- Pandolfino, J.E.
- Kahrilas, P.J.
- Drewes, A.M.
- Liao, D.
- Hirano, I.
- Perretta, S.
- Nicodeme, F.
- Roman, S.

Source: Scopus.com
Innovation to Research

![Citation overview](Image)

### Documents

<table>
<thead>
<tr>
<th>Title</th>
<th>Year</th>
<th>Total</th>
<th>Citations</th>
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<tr>
<td>1 Mechanical properties of the esophagus in eosinophilic gastro...</td>
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<td>2 Efficacy of treatment for patients with achalasia depends...</td>
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<td>3 Esophagogastric junction distensibility assessed with an...</td>
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<td>4 The functional lumen imaging probe (FLIP) for evaluation...</td>
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<td>5 Opioid-induced bowel dysfunction: Pathophysiology and manage...</td>
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<td>6 An alginate-antacid formulation (Gaviscon Double Action...</td>
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<td>7 Esophageal Distensibility as a Measure of Disease Severity...</td>
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<td>8 A new technique for evaluating sphincter function in...</td>
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<td>9 A double-blind sham-controlled study of the effect of...</td>
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<td>10 Achalasia</td>
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![Source: Scopus.com](Image)
Post-graduate Certificate in Innovation and Entrepreneurship
THE INNOVATION ACADEMY
Where ideas take shape
MISSION:

To develop a new kind of PhD graduate, expert in their discipline, with a thorough understanding of how innovation can convert knowledge and ideas into products, services and policies for economic and social and cultural benefit.
IDENTIFY VALUE

COMMERCIAL // SOCIAL // CULTURAL
ECONOMIC // EDUCATIONAL // SOCIETAL

VALUE UNUSED = WASTE?
INNOVATION IN THE BROADEST SENSE

Engineering, Mathematics and Science - Health Sciences - Arts, Humanities and Social Sciences
POSTGRADUATE CERTIFICATE
INNOVATION AND ENTREPRENEURSHIP

CORE (PREREQUISITE)

- CREATIVE THINKING AND INNOVATION (10 ECTS)
- OPPORTUNITY GENERATION AND RECOGNITION (5 ECTS)

SPECIALISED (CHOOSE 3 OF 4)

- CREATIVE CAPITAL (5 ECTS)
- PLANNING YOUR NEW VENTURE (5 ECTS)
- PROTECTING OR EXPLOITING YOUR IDEA (5 ECTS)
- LEADERSHIP (5 ECTS)
Innovation Academy Engagement – Since 2012
Some Points in Conclusion

- If you have an idea- try to do something about it
- Don’t forget to protect your idea
- TR&I are there to help – use them
- You need to have a realistic expectation from a potential commercial idea.
- There can be many benefits you are not aware of.
- Try to create a network of people you know outside your research group
- You will be surprised how willing others will be to help.
Thank You