



THE NEED FOR NUTRITION EDUCATION / INNOVATION PROGRAMME

Laying the foundations of nutrition
knowledge relevant to clinical and public
health practice



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In partnership with



Principal UK Hosting Partner



Key UK Knowledge Partner



Cambridge Hub Partners



(NNEdPro Cambridge Foundation and Co-ordinating Centre)

Ulster Hub Partner



(Nutrition Education Ulster)

International Partner



Notes:

- The **Need for Nutrition Education/Innovation Programme (NNEdPro)** and **Cambridge Research, Education And Training Enterprise (CREATE)** are jointly incorporated as a not-for-profit company limited by guarantee, based in Cambridge, UK.
- NNEdPro has formal affiliations with **Cambridge University Health Partners** (recognised 'CUHP Associate') and **Wolfson College**, University of Cambridge.
- The **British Dietetic Association (BDA)** has delegated authority to act on behalf on NNEdPro and acts as the principal UK host organisation for NNEdPro's virtual strategic partnership and networks (**UK NNEdPro Group**).
- The two work hubs overseen by the BDA on behalf of NNEdPro are located in Cambridge (**NNEdPro Cambridge Foundation [NCF]**) and Ulster (**Nutrition Education Ulster [NEU]**), in the UK.
- The Ulster Hub (NEU) works in close partnership with the Northern Ireland Centre for Food and Health (NICHE), Ulster University School of Biomedical Sciences.
- The Cambridge hub (NCF) is the co-ordinating centre for NNEdPro and works in close partnership with the Cambridge University Hospitals NHS Foundation Trust (CUH), the University of Cambridge School of Clinical Medicine, Cambridge University Health Partners (CUHP) and Wolfson College, University of Cambridge.
- The NEU and NCF represent Ulster and Cambridge based NNEdPro partnership activity, but are not separate legal entities and are not registered charities.
- The MRC Elsie Widdowson Laboratory (incorporating the UK National Diet and Nutrition Survey), which houses key NNEdPro members, provides a key UK knowledge link to the scientific evidence base.
- The Society for Nutrition Education and Behaviour, of which NNEdPro is a formally recognised 'Affiliate', provides a key international link to educational translation and evaluation strategies.
- The views of NNEdPro may not necessarily reflect those of the hosting and/or key partner organisations.
- For information on sponsorship/funding for Phases 1-3 projects please see corresponding tabs.

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Background

The **Need for Nutrition Education/Innovation Programme** (NNEdPro) is an award-winning and independently incorporated collaborative group for knowledge generation, translation and evaluation. The NNEdPro Group originally arose from the work of the British Medical Association representative within the Council of Europe Alliance (UK) on Hospital Food and Nutritional Care (2005-07) leading to the launch of the *Ten Key Characteristics of Good Nutritional Care* and the Department of Health Action Plan (2007) which recommended the formation of NNEdPro. Since its inception, NNEdPro has evolved from a single project, into a multi-faceted programme with a broad knowledge management remit across clinical and public health nutrition.

Partnership

The NNEdPro Group represents a strategic partnership between doctors, dietitians, nutritionists and other healthcare professionals, as well as educators and researchers. It is composed of several partner organisations including the British Dietetic Association, UK Medical Research Council's Elsie Widdowson Laboratory (incorporating the UK National Diet and Nutrition Survey), Society for Nutrition Education and Behaviour, Ulster University School of Biomedical Sciences, Wolfson College in Cambridge and Cambridge University Health Partners (including Cambridge University Hospitals and the School of Clinical Medicine).

Universities

The University of Cambridge houses a world class Medical School, whilst Ulster University is home to leading Health Professions Schools, including Pharmacy. In Ulster, NNEdPro Group members deliver Nutrition Education to students and practitioners, particularly in the Allied Health Professions. In Cambridge, the NNEdPro Group is responsible for the delivery of Nutrition Education to medical students as well as other students/professionals without a formal background in Nutrition. In particular, the NNEdPro Group has formal affiliations with Cambridge University Health Partners (recognised 'CUHP Associate') and Wolfson College, University of Cambridge.

Aims

NNEdPro undertakes continuing nutrition education needs assessment relating to medicine/healthcare to develop, deliver and evaluate a range of innovative education and training interventions with particular emphasis on effective delivery methods and healthcare impact. Overall, the inter-related aims of NNEdPro activity are:

- Delivery of Medical/Healthcare Nutrition Education
- Research into Medical/Healthcare Nutrition Education
- Nutrition Research for Translation to Medical/Healthcare Education
- Building Capacity and Policy Impact in Medical/healthcare Nutrition for Practitioners, Researchers, and Educators

In order to remain at the cutting edge of current knowledge, NNEdPro instigates primary research or evidence synthesis (e.g. via its linked **Nutrition and Vascular Studies** [NVS] platform in Cambridge) and also promotes capacity building as well as *Good Research Practice* to enhance the translation potential of emerging evidence. NNEdPro uses a range of approaches in line with the *Knowledge-to-Action Framework* to address key nutritional problems of clinical and public health importance in the UK as well as internationally (NNEdPro Global).

About the Group

The Need for Nutrition Education/Innovation Programme (NNEdPro) Group is a virtual strategic partnership and operates via a core team located at two UK work hubs in Cambridge (co-ordinating centre) and Ulster, bringing together NNEdPro key partner organisations as well as a collaborative network of key individuals, in various capacities linked with NNEdPro Phases 1 to 3 (2008-16). In February 2015, the Cambridge Hub was formally relaunched at an inaugural symposium, as the NNEdPro Cambridge Foundation (NCF). NNEdPro has formal affiliations with Cambridge University Health Partners (recognised as 'CUHP Associate') and Wolfson College, University of Cambridge.

All members of the NNEdPro Group (and collaborative network) are invited to meet in Cambridge annually (February) to contribute to the steering of projects and initiatives across the programme. The NNEdPro Core Team (Cambridge and Ulster Hubs) meets monthly to take forward agreed programme objectives and works in consultation with key group members. Each year, the NNEdPro Group also organises educational/scientific meetings as well as training sessions which are open to external delegates.

In April 2015, **The Lord Balfe of Dulwich**, Honorary BDA President and a resident of Cambridge, became the first Honorary Patron of NNEdPro. Lord Richard Balfe functions as a Special Advisor to the NNEdPro Chair/Directors and as Ex-Officio Co-Chair (with the BDA Chief Executive) of the annually convened NNEdPro Senior Advisory Panel.

NNEdPro Members

LEADERSHIP & CORE TEAM

BOARD OF DIRECTORS & PRINCIPAL OFFICERS

Prof Sumantra (Shumone) Ray, RNutr

NNEdPro Founding Chair/Programme Director
(Strategic Development and Global Leadership)
Cambridge, England

Pauline Douglas, RD

NNEdPro Vice-Chair/Education Director
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RESEARCH FELLOWS PANEL

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NETWORK REPRESENTATIVES PANEL

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NNEdPro COLLABORATIVE NETWORKS

GIP 2016 SUMMIT ADVISORY PANEL

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USA

Prof Leah Gramlich

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Prof Darwin Deen

USA

Melita Avdagovska

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GIP INDIA NETWORK

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EMERGING REGIONS OF INTEREST- *Coming Soon*

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Dr Lynn McCotter, RD

NNEdPro Research Fellow

Dr Helen McCarthy, RD

Associate Member of Ulster University

Siobhan Gallen

Pharmacist with a special interest in Nutrition

NNEdPro in 2016:

Event	Location	Date
Biannual NNEdPro Network Meeting and Nursing Essay Competition & Symposium	Cambridge, UK	February 1 st 2016
The 2016 Cambridge-India International Symposium on Diabetes, Nutrition and Personalised Medicine	Kolkata, India	February 11 th , 2016
Launch of NNEdPro Australia and New Zealand Network	Perth, Australia	March 19 th , 2016
The American Society for Nutrition, Experimental Biology Conference 2016	San Diego, USA	April 2 nd , 2016
Scaling Up Nutrition Research and Education workshop in Morocco	Morocco	April 25 th , 2016
Global Summit in Medical Nutrition Education and Research	Cambridge, UK	June 17 th - 19 th 2016
Summer School in Nutrition	Cambridge, UK	June 20 th -24 th 2016
Biannual NNEdPro Network Meeting	Cambridge, UK	August 2016 (TBD)
Winter School in Research Methods	Cambridge, UK	November 2016 (TBD)

NNEdPro in 2015:

Presentations at Scientific Meetings 2015

Event	Location	Date
NNEdPro UK Symposium and National Essay Competition**	Cambridge, UK	Feb 2015
East of India Lecture Tour:	Kolkata, India	Feb 2015
- Indian Institute of Management		
- Srimanta Sankaradeva University of Health Sciences		
- World Congress on Public Health**		
- National Institute of Cholera and Enteric Diseases	Guwahati, India	
International Obesity Summit	London, UK	April 2015
The American Society for Nutrition and Experimental Biology**	Boston, USA	April 2015
European Conference on Obesity	Prague, CR	May 2015
International Congress of Occupational Health	Seoul, Korea	June 2015
WHO Collaborating Centre for Public Health Education and Training	Imperial College, UK	June 2015
EXPO 2015 Nutrition Symposium	Milan, Italy	June 2015
NNEdPro International Summit on Medical Nutrition Education and Research**	Cambridge, UK	Aug 2015
Nutrition Society Postgraduate Conference	Cambridge, UK	Sept 2015
Centre for Public Health	Queen's University Belfast, UK	Sept 2015
EU-China Symposium on Nutrition and Diabetes	Shanghai, China	Sept 2015
Cambridge Institute for Public Health Conference	Cambridge, UK	Oct 2015
European Federation of the Associations of Dietitians Conference	Amsterdam, The Netherlands	Oct 2015
International Conference on Polyphenols and Health	Tours, France	Oct 2015
International Conference of Primary Care and Public Health	Imperial College, London, UK	Oct 2015

British Medical Association Annual Research Awards	London, UK	Nov 2015
Food Matters Live	London, UK	Nov 2015
European Parliament	Brussels, Belgium	Nov 2015
Annual Research Symposium of the British Dietetic Association	Birmingham, UK	Dec 2015

NNEdPro UK Symposium and National Essay Competition, Cambridge, UK

Let food be thy medicine¹

Coverage by the British Medical Association

The importance of nutrition as part of a healthy lifestyle is well understood by the medical profession, but whether this information is adequately covered in medical education, or adequately incorporated into medical care is another matter.

The Need for Nutrition Education/Innovation Programme (NNEdPro) is an international collaboration of doctors, dietitians, nutritionists and other health professionals born from work by the BMA from 2005 to 2007. It is trying to encourage the medical professional to incorporate nutrition into healthcare, and encourage universities to incorporate nutrition into medical education. Activities include delivering and evaluating nutritional educational interventions, and measuring the impact on healthcare practices.

The launch of the NNEdPro Cambridge Foundation in February also marked the first year of the national NNEdPro essay competition, and first-year medical student, Catherine Meachin, was announced the winner. When responding to the topic 'let food be why medicine...', she acknowledged "...had it just been for my medical education, I may have questioned the value of this statement". Catherine's presentation was particularly impressive because of her idea to utilise the growing notion of social responsibility to facilitate all individuals, including doctors, to support adequate nutrition in hospitals.

The two runners-up, Benjamin Norton and Rachel Wilson, also shared inspiring ideas to promote nutrition in healthcare settings and that good nutrition education and delivery are a cornerstone of effective healthcare.

In addition to the essay competition, the symposium provided a platform to share ideas and encourage the pursuit of NNEdPro activities. The symposium started with NNEdPro founder-chair Sumantra Ray and vice-chair Pauline Douglas providing context for the need for nutrition education among healthcare professionals and highlighting current projects underway by NNEdPro. Then, pioneering medical nutrition educationist Martin Kohlmeier of University of North Carolina highlighted the US experience of medical nutrition education. Harrison Carter spoke as co-chair of the BMA Medical Student's committee. Finally, the NNEdPro Global Innovation Panel presented on work occurring around the world, with representatives from Canada, US, Australia, New Zealand and India.

This symposium marks the next stage of NNEdPro pursuits. With the support of the Conservative peer, Lord Balfe of Dulwich, NNEdPro's first honorary patron, this organisation endeavours to build the evidence base behind letting 'food be thy medicine' and cement it in the healthcare curriculum.

¹ Let food be thy medicine. (2015). *BMA*. Retrieved from <https://communities.bma.org.uk/bmaspace/b/weblog/archive/2015/03/26/let-food-be-thy-medicine>

NNEdPro at the World Congress on Public Health 2015, Kolkata, India

Coverage by Complete Nutrition²

One of NNEdPro's key themes is to promote research capacity in the nutrition workforce. In 2014, the NNEdPro Group conducted a needs assessment of almost 200 doctors and dietitians in relation to nutritional care entitled 'Confidence and attitudes of doctors and Dietitians towards nutrition care and nutrition advocacy for hospital patients in Kolkata, India's *Journal of Biomedical Education* 2015. Amongst other things this highlighted the need for research training to enable the generation of local data. This assessment began to highlight how dependent people are on nutrition guidelines derived from Western world studies. Therefore, in February 2015, 5 members of the NNEdPro Group, Dr Sumantra Ray (NNEdPro Founder-Chairman/Programme Director), Pauline Douglas (NNEdPro Vice-Chairman/Education Director), Dr Minha Rajput-Ray (NNEdPro Lead Medical Advisor), Marietta Sayegh (NNEdPro Coordinator) and Laura Fitzpatrick (NNEdPro Assistant Coordinator) were invited to Kolkata in India to deliver workshops in and around the 14th World Congress on Public Health (WCPH) in the hope that this will help pave the path to the generation of indigenous data to support nutrition guidelines.

A first short workshop was carried out by the NNEdPro Group during a satellite capacity building event of the WCPH. The aim of this workshop was to begin to provide young public health and healthcare professionals with knowledge, resources and skills in order to equip them to become ambassadors for evidence based practice as well as introduce the principles of change management. This event was followed by an interactive activity where these young professionals, divided into smaller groups, were given the opportunity to voice their opinions/ideas to suggest strategies to tackle nutritional problems of clinical and public health importance. A focus on the importance of nutrition as part of healthcare responsibilities and empowering change through management and leadership techniques was provided during a second, more extensive workshop that the NNEdPro Group help in Kolkata.

The main aims of this session were:

- To highlight the important role nutrition and hydration plays in population health and disease management.
- To outline core principles of 'Food, Fluid and Nutritional Care'.
- To contextualise nutrition and hydration in current policy guidelines, and clinical application.

A key focus of this training day was the need for dynamic interaction between Medical Doctors, Dietitians and Nutritionists and how the synergy from this can be utilised to help optimise population health at both preventative and therapeutic levels. This was achieved through two sessions. Session one looked at how change management techniques can be used practically to

² Fitzpatrick, L., Sayegh, M., Douglas, P., Ray, S., McCotter, L., & Rajput-Ray, M. (2015). NNEdPro at the World Congress on Public Health, India. *Complete Nutrition Focus*, (Vol.7 No. 2), 60. Retrieved from <http://www.nnedpro.org.uk/wordpress/wp-content/uploads/2015/06/NNEdPro.pdf>

empower leadership of the participants as NNEdPro believe that simply providing technical training without change management tools is ineffective for translation to practice. Session one also incorporated a selection of rotational workshops, during which key aspects of nutrition, nutritional care and importance of hydration were highlighted and in some cases used nutrition and hydration games as a novel learning tool. Presentations and practical case studies to help develop change management and leadership in relation to nutritional care outcomes were also included in one of these workshops.

Session two introduced some of the background work/research of the NNEdPro group and the prevalence of malnutrition within the UK including the NNEdPro Nutrition Education for Improved Clinical Outcomes (NELICO) project. More information available at www.nnedpro.org.uk. Participants, in groups were then faced with the task of designing a NELICO-type project to enhance nutrition education and leadership for improved clinical outcomes. Speakers from each group were then self-selected to present their project ideas.

Following the NNEdPro workshops, 'NELICO Champions' were then selected as 'high fliers' based their contribution to the group work activates and their enthusiasm towards the cause of improving nutrition education. NELICO champions were then invited to a round table event where they could pitch their NELICO project ideas and as a group decide upon two ideas to take forward.

Two NELICO India projects were selected to raise nutritional awareness in the Indian population. Both NELICO India projects will be overseen by NNEdPro in partnership with *The Remedy Clinic Study Group, Kolkata* and *The Halo Medical Foundation based in Maharashtra*.

Following the NELICO workshop the Commonwealth Dietitian and Nutritionists Association (CDNA) was launched. This was chaired by Pauline Douglas as inaugural CDNA chair and with key speakers, Prof Sumantra Ray (NNEdpro Chair), Sheela Krishnaswamy (Board Member CDNA), Dr Fiona Sim (Royal Society of Public Health), Dr Sagarika Mukerjee and Dr Sabyasachi Ray (Remedy Clinic Study Group). This inaugural meeting was held to engage with stakeholders and policy makers relevant to nutrition and public health in India. There was a great turnout for this event with overwhelming enthusiasm from the audience emphasising the demand for the development of such an association. Audience members were asked for their views on what they would like CDNA to do for them. These comments will be considered in the development of CDNA's action plan.



This exciting India facing work adds another valuable facet to NNEdPro Global activities, which this year alone, spans from Boston and Ontario in North America to Seoul and Shanghai in the Far East.

Laura Fitzpatrick, Marietta Sayegh, Pauline Douglas, Prof Sumantra Ray, Dr Lynn McCotter, Dr Minha Rajput-Ray

The American Society for Nutrition and Experimental Biology, Boston, USA

The NNEdPro group attended Experimental Biology 2015 in Boston. We not only took full advantage of the busy scientific programme, special events and workshops but a large number of the team also presented findings from our work. NNEdPro was invited to participate in a special medical education session organised by the American Society for Nutrition where Prof Sumantra Ray and Pauline Douglas presented on NNEdPro's experience in the UK, Jennifer Crowley on the New Zealand perspective and Celia Laur on the Canadian experience.

NNEdPro also held a mini symposium where the work of NNEdPro was showcased across themes, alongside an outline of future projects.



Abstracts

- A Proposed Epidemiological Approach to Investigate Mechanisms between Diet and Vascular Function
- Does Habitual Fruit Consumption Modulate Microvascular Endothelial Function in Healthy Human Participants?
- Effects of Green Tea and Coffee Polyphenols on Cardiometabolic Function in Women with Polycystic Ovary Syndrome
- Hydration and Dietetic Practice in the United Kingdom
- Nutrition in the University of Cambridge Medical Curriculum – Student Perspectives
- Pilot Evaluation of a Nutrition Training Intervention for Pre-Registration Pharmacists in Northern Ireland
- Potential Modulation of Vascular Function Relating to Baseline Hydration Status in Healthy Human Participants in a Randomised Controlled Trial
- The DASH Diet, Cardiovascular Disease Risk and Obesity in the United Kingdom

1st Annual International Summit on Medical Nutrition Education and Research, Cambridge, UK

The inaugural International Summit on Medical Nutrition Education and Research was hosted by the NNEdPro Global Innovation Panel at Wolfson College, at the University of Cambridge at the beginning of August 2015. The summit successfully brought together experts from across the globe to strengthen and promote international initiatives and exchange knowledge on medical nutrition education and research. Speakers came from seven countries, across four continents.



The message from all the speakers was clear and consistent – there is woefully little nutrition in medical curricula across the globe. It is therefore no surprise that we hear of people receiving little, if any, nutrition support from doctors; or advice that is based on nutrition myths rather than evidence. Details of each presentation are available below.

Following the success of this first Summit, plans are already underway for the 2016 event. This event will be an opportunity to share details of all the exciting developments that are occurring across the globe. Please watch this space as more details on the 2016 Summit become available.

Overview of the 2015 Summit

The 2015 International Summit on Medical Nutrition Education had five goals:

1. Share information on the current state of medical nutrition education and associated research in each region
2. Share examples of learning from each region, including examples of successful and less successful initiatives and actions
3. Identify common or shared needs across regions
4. Showcase examples of transferable models of strategies across regions
5. Identify opportunities for joint strategies in medical nutrition education

Co-facilitators: Dr Lauren Ball and Celia Laur (NNEdPro GIP co-leads)

Summit Chair: Prof Sumantra Ray

Summit Vice-Chair: Pauline Douglas

Opening remarks: *The Lord Balfe of Dulwich; BDA Chairman Dr Fiona McCullough and Cambridge University Public Health Director, Dr Steve Gillam*

Closing remarks: *Professor Darwin Deen from New York, Harrison Carter Co-chair of the Medical Students Committee, British Medical Association and key members of the NNEdPro Group.*

Medical Nutrition Education

These presentations focused on the quantity and quality of nutrition education provided to medical students within each country. Discussion topics included *who* provided nutrition education, *how* nutrition education was structured, delivered and assessed, and *why* there are still barriers to optimal nutrition education of medical students.

UK: *Dr Kathy Martyn – University of Brighton and Sussex*

Developing Nutrition Education: Implementing the undergraduate nutrition curriculum

USA: *Prof Lisa Hark – Jefferson Medical College*

Medical Nutrition Education: Best practice examples, competencies, and assessment

CANADA: *Melita Avdagovska – Wellness Rx, University of Alberta*

The Evolution of WellnessRx: Initiating a Paradigm Shift from “Illness Care” to “Health Care” Through Nutrition and Physical Activity Education

ITALY: *Prof Livio Luzi – University of Milan*

Medical Nutrition Education in Italy: Changes and Challenges

INDIA: *Dr Anand Ahankari – University of Nottingham and Halo Medical Foundation, India*

Medical Education and Nutrition Training, India

AUSTRALIA: *Prof Caryl Nowson – Deakin University*

Nutrition in Medical Education in Australia

NEW ZEALAND: *Prof Clare Wall and Jennifer Crowley – University of Auckland*

Medical Nutrition Education in New Zealand

Medical Nutrition Research

Following a roundup of the ‘state-of-play’ in Medical Nutrition Education from across the globe, the following speakers emphasised the importance of Nutrition Research informing the content of Nutrition Education, and highlighted the need for Research into the effectiveness of Nutrition Education on developing nutrition competence in medical students and practitioners.

Introduction: NNEdPro and Medical Nutrition Research, *Prof Sumantra Ray*

Hydration Research into Education, *Pauline Douglas and Dr Lynn McCotter*

Integrating Nutritional Genomics (Research) in the Medical School Curriculum, *Prof Martin Kohlmeier*

Breakout Sessions

Breakout sessions explored ways of developing joint strategies and cross-border solutions to address common gaps. Topics included:

As a field, where do you think Medical Nutrition Education should go next?

Facilitators: Katherine Jukic, Prof Martin Kohlmeier

What type of fundable medical nutrition education initiatives could we do internationally?

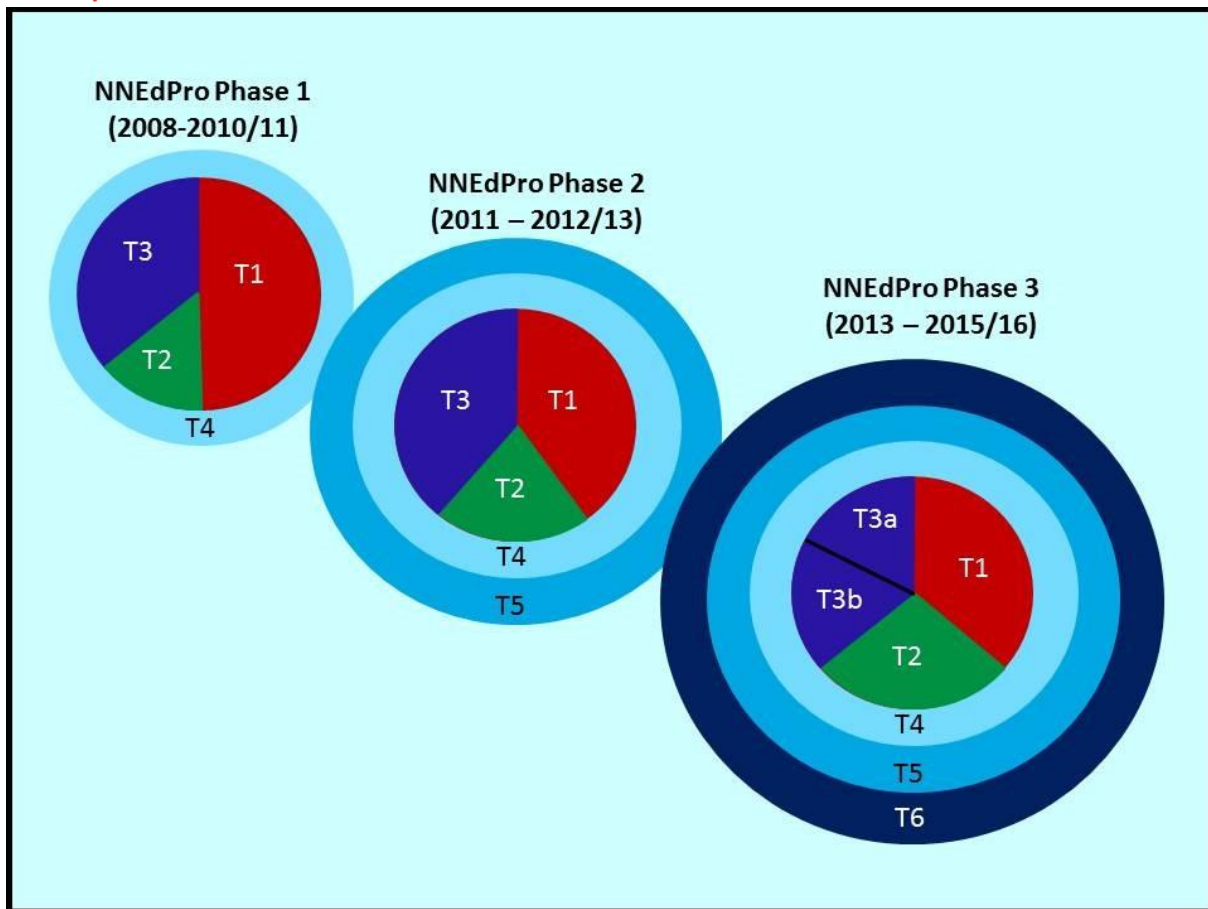
Facilitators: Prof Caryl Nowson; Prof Martin Kohlmeier

With ever changing research findings in nutrition, what is the best way to translate evidence-based nutrition messaging for medical students? Doctors? Other healthcare professionals?

Facilitators: Harrison Carter; Clare Wall

NNEdPro Phases

Development of NNEdPro Themes



NNEdPro Phase 1 (2008 – 2010)

Objective: To deliver and evaluate a novel nutrition education intervention for medical students from 15 medical schools across England.

NNEdPro arose from the work of the British Medical Association representative to the Council of Europe Alliance (UK) on Hospital Food and Nutritional Care. Prior to initiating Phase 1 (national pilot work), developmental work was conducted by founder members of the project group at the University of Dundee over a 3 year period (Dec 2005 to Nov 2008). The aim of this work was to conduct a pilot education intervention 'Nutrition Education Workshop for Tayside Doctors' (NEWTayDoc) aimed at developing a wider reaching programme, targeting latter-stage medical students or junior doctors.

With the movement of the founder members of the group to Cambridge, NNEdPro was established as an independent educational innovation project (incorporating research). This project was incorporated within the Department of Health Nutrition Action Plan (2007), funded by an unrestricted educational grant from Abbott Nutrition and hosted by the British Dietetic Association.

The academic partners for this project were the Universities of Cambridge and East Anglia, represented by advisors from both institutions. NNEdPro also became the UK affiliate of the Society for Nutrition Education in 2010.

Both patients and the public have a high regard for nutritional advice from doctors, who in turn, have a responsibility to provide advice that is sound and safe. NNEdPro Phase 1 work involved running 2-day workshops aimed primarily at 4th year medical students. These aimed to lay the foundations of nutritional knowledge and attitudes relevant to clinical practice, raising awareness of the recognition, prevention and management of malnutrition in hospital and highlighting the principles of nutrition, and a doctor's responsibility. These workshops were conducted as part of an educational study to assess the impact of delivering intensive nutrition education to a cohort of UK medical students. By completing the training students achieved a practically orientated certificate in clinical nutrition.

Work from this phase has been presented at the annual conferences of the Institute of Clinical Research (poster won 1st prize), the British Dietetic Association (oral), the Association for the Study of Medical Education (oral), and the British Association for Parenteral and Enteral Nutrition (poster won Nutrition Society Prize). An invited presentation was delivered to the Intercollegiate Group on Human Nutrition and the NNEdPro group has been consulted by the NHS Sustainable Development Unit leading to a journal paper and other organisations on educational research methodology.



NNEdPro Training, 2009



The pre-Phase 1 work in Dundee and the collaborative work with the Sustainable Development Unit in Cambridge were funded by the NHS in Scotland and England, respectively.



NNEdPro Phase 1 was supported by an unrestricted educational grant from Abbott Nutrition. The views expressed on this website are those of the NNEdPro group, and not necessarily those of Abbott Nutrition.



NNEdPro Phase 2 (2010 – 2012)

Nutrition Education Review/Research Interests Group (NERG)

NNEdPro collaborates with the Nutrition Education Review/Research Interests Group (NERG) in the Department of Public Health and Primary Care, at the University of Cambridge, School of Clinical Medicine.

In the academic year 2010-11, Cambridge University approached the NNEdPro Group to collaborate on a first round of clinical and public health nutrition teaching for 4th Year Cambridge medical students.

The teaching approach was based on that pioneered in NNEdPro phase one, when 98 medical students from 15 medical schools across England were taught these concepts during an intensive weekend course run in Cambridge. That material was used as the basis for a half day of teaching. Students were tested on their nutrition knowledge using a before and after multiple-choice test, and written feedback from the participants was also obtained.

The teaching has continued over the 2011-12, 2012-13, 2013-14 and 2014-15 academic years and NNEdPro group members also contribute to Student Selected Components (SSCs). Nutrition now has a place in the clinical phase of the Cambridge Undergraduate Medical Curriculum.

Core Teaching Aims

- To highlight that nutrition forms an important part of a Doctor's responsibilities.
- To provide an overview of clinical and public health nutrition issues relevant to medicine.
- To outline core principles and practical applications of 'Food, Fluid and Nutritional Care' in hospital especially:
 - To understand the difference between nutrition screening and assessment.
 - To understand the role of different members of the multidisciplinary team.
 - Protected mealtimes.
 - Nutritional screening vs assessment.
 - Managing over- and under-nutrition.
 - Fluids, electrolytes and micronutrients.

Nutrition Education Leadership for Improved Clinical Outcomes (NELICO)

Objectives

To deliver and evaluate innovative training in 'Nutrition Education and Clinical Leadership' for Junior Doctors, enabling 'nutrition awareness weeks' across 3 NHS hospitals in England.

In the second phase of the programme, *Nutrition Education Leadership for Improved Clinical Outcomes (NELICO)*, the NNEdPro group tested the feasibility of having Junior Doctors lead a nutrition awareness-raising week in the hospital environment.

Aims

1. To assess whether providing Junior Doctors / senior medical students a 2 day course covering previous (NNEdPro) teaching in clinical nutrition as well as additional teaching in leadership and change management techniques, can result in an improvement to their Knowledge Attitudes and Practices (KAP) related to this training intervention (before and after comparison)
2. To test whether involving hospital staff in a week-long awareness-raising session run by the team leaders noted in Aim 1, and focused on clinical nutrition can improve their confidence in the nutritional management of patients (before and after comparison)
3. To gain insight into barriers to (as well as solutions for) improving awareness and practices relating to nutrition in the hospital setting.

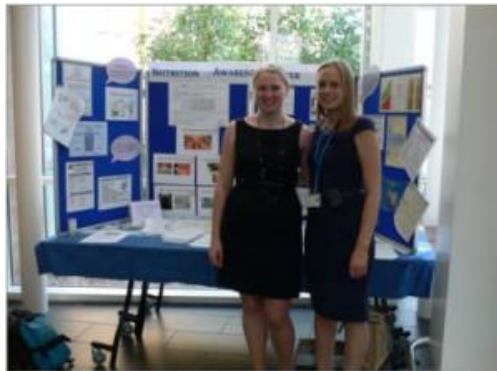
Training and Awareness Weeks

Junior Doctor Leads (the Nutrition Champions) were recruited from those who had attended the clinical nutrition weekend teaching in Cambridge. Each champion recruited 3-4 Junior Doctors from their hospital and all participants attended a weekend of training in Cambridge.

This training included a refresher course on nutrition, training on leadership and management, and the opportunity to plan their awareness week with their group. These weeks were completed between May – June 2012, and included Junior Doctor run teaching, nutrition awareness stalls and a variety of other events, raising the profile of nutrition in NHS hospitals. Interviews with hospital staff were also conducted on their views of hospital nutrition and awareness weeks.



NELICO Participants at Training Session, Cambridge, 2012



NELICO Nutrition Awareness Weeks, 2012

NELICO Junior Doctors

Dr Alfred Adiamah
 Dr Sarah Yoon-Ai Ng
 Dr Robyn Perkins
 Dr Aleem Raza Hussain
 Dr Kate Griffin
 Dr Nigel Fellows

Dr Hafiz Aladin
 Dr Kunal Lund
 Dr Laura Ann Minns
 Dr Colin McMillan

NELICO Medical Student

Mr Shiv-Anand Bhakta

NNEdPro 2012 Round Table Event for Policy Makers and Practitioners

In October 2012 NNEdPro marked its fifth year, since arising from the Department of Health Nutrition Action Plan (2007), and hosted an event at MRC Head Office in London including presentations, a facilitated discussion and a networking session on the provision of nutrition education within Britain's hospitals and medical schools. (Chair: Sally Standley, Director of Innovation for Cambridge University Health Partners)

This event provided an opportunity for key stakeholders from the nutrition and medical education communities to learn more about our nutrition education initiatives. Discussions were held on how we might improve nutrition education for tomorrow's doctors in the UK and explored possible areas for collaborative work in the future. These results have also now been published in the Royal Society for Public Health Journal, Perspectives in Public Health.

Event Objectives

- To inform key members of the medical education and healthcare community of NNEdPro's work to date and direction for the future.
- To have a facilitated discussion regarding the current and future provision of nutrition education within Britain's hospitals and medical schools.
- To suggest areas for future collaborative work to improve nutrition education for tomorrow's doctors.

Key Discussion Themes

Medical Education (clinical and public health nutrition)

- Nutrition is an important factor affecting clinical outcomes. Being undernourished in hospital is as much of a danger as medication errors.
- Patient care should always be the priority. It is important to put the patient at the centre of all training to ensure lessons can be applied immediately.
- It is important to be pragmatic and flexible when incorporating nutrition in the medical curriculum as there are potentially barriers and challenges. In or outside the curriculum, it is important to have a robust evaluation method to assess the effectiveness of training.
- Junior doctors in the foundation years are at the ideal stage to benefit from nutrition teaching. It is important for tomorrow's doctors to learn about nutrition early in their careers, and training programmes such as NNEdPro/NELICO provide a unique opportunity to increase knowledge and professionalism in this area.
- A large proportion of doctor training is conducted out of hours and it is worthwhile looking into other methods of teaching, including web-based methods.
- Improving professional confidence amongst clinicians who are giving nutrition advice is key.

- It may be appropriate to take the nutrition teaching model out of the classroom and beyond the pilot stage, moving it into hospitals and the community.

Nutrition Education (professions other than medicine)

- A sound evidence base is essential to foster learning.
- Looking at the general practice aspects of healthcare and how to prevent undernutrition occurring in the community is important.
- There is a need to identify what care, support and/or education can be provided for those at risk of under-nutrition in the community.
- A more creative approach to nutrition can be adopted. Can those with time to talk be trained to give nutrition advice?
- Supermarkets could help with teaching and learning as well by guiding customers to better choices in terms of nutrition.

Healthcare Policy and Service Delivery

- Nutrition should be looked at in terms of patient safety, and be incorporated into local safeguarding responsibilities. For example, as the safeguarding team can and will look at pressure sores, they can also respond to malnutrition related issues, including complaints from patients or families.
- Accountability is an issue. Everybody is interested in nutrition but it is seen as nobody's responsibility. It is important to increase the awareness of, as well as inter-professional responsibility for, malnutrition-related issues.
- It is important to acknowledge the work done in other hospitals, communities or countries and build upon their best practice methods.
- There is potential to create a nutrition toolkit which would be targeted at management leaders in hospitals. It would list the reasons for nutrition to be taken seriously. Examples include: help with CQC performance / assessments; reducing complaints; improving the quality of service and the patient feedback; potential to save hospital funds.

Patient and Public Safety

- A pivotal place to start raising nutrition awareness is with the regulators. If they use nutrition-based criteria, hospital staff will also need to pay attention to those areas. Patient safety can be used as a 'hook' to increase staff interest.
- Where possible, it is important to place focus on patient-centred care and integrated care; and to try to remove bureaucratic and financial barriers to addressing nutrition issues.
- There is a need to look at the expressed needs of the patients that this work is designed to help.

Communication and Multidisciplinary Working

- There is a need to go beyond structural change and ensure we use a common language for nutrition. If you have a common understanding and a common terminology it is easier to work together.
- Inter-professional learning is a challenge in all hospitals and not easy to improve quickly. Multi-disciplinary and multi-level training needs to be supported by management.
- Lessons can be learned from looking at how the knowledge was communicated to staff in the hospital environment.
- There is a need to look into more innovative training methods, including via web-learning or tele-learning or hospital televisions or another system. One innovative method could be to add to a nutrition portfolio (similar to a doctor e-portfolio).

How can NNEdPro add value to your organisation?

- Communication is key. It is important to keep communicating with other organisations who are working towards a common goal. This will allow nutrition awareness to gain momentum and also decrease the risk of simply repeating work done elsewhere.
- Having clearer arguments on the financial value of nutrition teaching (via savings) would help to build support in many areas.
- It is important to get more patients involved in this work. Nutrition needs to be everybody's business.
- NNEdPro can use consistent messages that can be used across organisations.
- A patient safety network will offer opportunities to influence other key bodies.

Supported by:



NELICO and the Round Table Event were supported by an unrestricted educational grant from Abbott Nutrition. The views expressed on this website are those of the NNEdPro group, and not necessarily those of Abbott Nutrition.

NHS Partnership Working

The NNEdPro Group has developed expertise around evidence synthesis to inform nutrition education and training components of NHS nutritional care pathways. The Group has been consulted by NHS Primary and Secondary Care organisations to translate this evidence into knowledge that can inform policy and practice. The generic expertise that has accrued within the NNEdPro Group is also useful to NHS organisations in an advisory capacity.



NNEdPro Phase 3 (2013 – 2016)

Overall Aim and Mission: To strengthen the foundations and application of nutrition knowledge, relevant to clinical and public health practice, through education, research and innovation.

In Phase 3, the NNEdPro group continues to develop and deliver face to face, online and blended learning courses as well as training materials. In addition, particular focus is being placed on developing a new educational package on Hydration and Health for doctors and other healthcare professionals as this represents a current knowledge gap area. The group continues to develop a translational interface with nutritional aspects of Cardiovascular/Metabolic Risk Management, whilst also continuing to work in the area of malnutrition particularly in relation to healthcare institutions.

At a local level, in Cambridge, the NNEdPro Group continues to support the University of Cambridge School of Clinical Medicine Nutrition Education Review/Research Interests Group (NERG), and Generic Nutrition Training (GNT) in association with the MRC Elsie Widdowson Laboratory's Public Health Nutrition Forum. The NNEdPro group also continues to build collaborations with key clinical/academic colleagues based at the Addenbrooke's Biomedical Campus. In Ulster there is a developing collaborative interface with the School of Biomedical Sciences at the Coleraine Campus.

More widely, we have launched the NNEdPro Global Knowledge Exchange Faculty, as a translational vehicle that seeks to draw from the individual and collective expertise within the NNEdPro group and interface with clinical and public health practice at both national and international levels. The NNEdPro Global Innovation Panel provides strategic oversight to this virtual faculty and organises or contributes to periodic knowledge exchange meetings/events in Medical Nutrition Education, in collaboration with other nutrition organisations. These activities have led to the formation of NNEdPro Global Networks.

The **NNEdPro 2016-20 Strategic Plan** for Practice-relevant Education, Training and Research will be launched in early 2016.

Phase 3 has been divided into primary and secondary themes for better organization of our activities:

Primary Themes (Drivers/Innovators)

Theme 1 (T1): Medical Education and Leadership for Better Healthcare

Theme 2 (T2): Patient Safety, Health Services and Public Health

Theme 3 (T3): Evidence Based Disease Management and Prevention of Disease

Secondary Themes (Enablers/Satisfiers)

Theme 4 (T4): Value through Partnerships

Theme 5 (T5): Supporting Workforce Capacity

Theme 6 (T6): Promoting International Knowledge Exchange

Theme 1: Medical Education and Leadership for Better Healthcare

Nutrition/hydration education and clinical/public health leadership training of medical, healthcare and research professionals

Previous Research through Delivery of Medical/Healthcare Nutrition Education:

- **NewTayDoc:** Prior to initiating Phase 1 (national pilot work), developmental work was conducted by the NNEdPro Chair and key others at the University of Dundee over a 5 year period (2003 to 2008), culminating in a pilot education intervention 'Nutrition Education Workshops for Tayside Doctors' (NEWTayDoc) aimed at informing the development of NNEdPro 2009. Results published in MedEdWorld, 2012. **COMPLETE**
- **NNEdPro 2009:** Developing and conducting two-day workshops for primarily 4th year medical students in England. The purpose was to raise awareness on the recognition, prevention and management of clinical and public health nutrition, particularly in hospital settings. Results published in MedEdWorld and BMJ Open 2012. **COMPLETE**
- **Nutrition Education Leadership for Improved Clinical Outcomes (NELICO):** The objective was to deliver and evaluate innovative training in nutrition education and clinical leadership for junior doctors, enabling them to run Nutrition Awareness Weeks across three NHS hospitals. These weeks were found to be effective based on results from pre and post training questionnaires and semi-structured interviews with participants and hospital staff. Results to be published in 2014. **COMPLETE**
- **Nutrition, Hydration and Dysphagia Games:** Evaluation of games as a novel teaching and learning tool for healthcare professionals. **COMPLETE**

Delivery of Medical/Healthcare Nutrition Education (including education of nutrition researchers):

- **Nutrition Education Review/Research Interests Group (NERG):** Collaboration with the Department of Public Health and Primary Care, at the University of Cambridge School of Clinical Medicine. Through this collaboration, nutrition now has a firm place in the clinical phase of the Cambridge Undergraduate Medical Curriculum. Results published in the Journal of Multidisciplinary Healthcare 2014. **ONGOING**
- **Generic Nutrition Training (GNT) with the MRC Elsie Widdowson Laboratory (EWL):** Modelled on the success of NERG collaboration with MRC EWL Scientists led to the formation of a Public Health Nutrition Forum to deliver courses for postgraduate students and staff in Cambridge. Collaboration with the MRC EWL also facilitates Associate Nutritionists on an academic training pathway to full registration in the UK Voluntary Register of Nutritionists (Public Health Nutrition and/or Nutrition Science categories). Going forward GNT courses will be managed under NERG. **ONGOING**

- **Short courses, certified modules and e-Learning:** Using the NERG as a platform to collate and consolidate all course materials developed by NNEdPro to date, further development of bespoke, online, face-to-face and blended learning in nutrition is underway to launch a suite of training courses endorsed by Cambridge University Health Partners over 2015/16. **ONGOING**

Research into Medical/Healthcare Nutrition Education (including advocacy around policy and professional standards):

- **Hydration Education in Healthcare:** The NNEdPro Group conducted a survey on hydration awareness among doctors and dietitians and used results from this survey to develop an educational package on hydration which was piloted and evaluated for General Practitioners in 2014. Further pilots have also been undertaken for medical students as well as in senior school (Cambridge) and also in an international context (India). Results to be published in 2015/16. *See next page for more details* **ONGOING**
- **Nutrition in Pharmacy:** Ulster based project to survey knowledge, attitude and practice in nutrition among pharmacists and to conduct a subsequent nutrition training day. Details available upon request. **ONGOING**
- **UK Medical Student Essay Competition:** Winning ideas from the 2015 essay competition will be facilitated as pilot work by NNEdPro. **ONGOING**
- **Review and National Survey of Medical Nutrition Education:** A comprehensive review and survey across UK medical schools to determine current 'state of play'. **ONGOING**
- **NNEdPro-NELICO International Initiatives:** Multiple projects in partnership with the NNEdPro Network in India and other Global Networks. **ONGOING**
- **Golden Jubilee International Fellowship:** Project in partnership with the Society for Occupational Medicine to set up UK and India comparative educational cohorts (Medicine, Nursing, Nutrition/Dietetics). **ONGOING**
- **Advocacy informed by Education/Research:** Following an invited presentation (2010) to inform the curriculum process being led by the Academy of Medical Royal Colleges, and after the success of the 5-Year Round Table Event (2012) and a follow on invited presentation (2013) to the General Medical Council (GMC) Inter-Regulatory Group, discussions continue with the Association for Nutrition Healthcare Specialism Working Group (Co-Chair: Prof Sumantra Ray) as well as the GMC credentialing team. **ONGOING**

Hydration Education in Healthcare (HEH)

Principal Investigators: Pauline Douglas, RD (Ulster) | Prof Sumantra Ray, RNutr (Cambridge)

Medical Advisor: Dr Minha Rajput-Ray (Cambridge)

Scientific Advisor: Dr Joan Gandy, RD (London)

Coordinator/Analyst: Dr Lynn McCotter (Ulster)

Assistant Coordinator: Laura Fitzpatrick, ANutr (Cambridge)

Objectives:

- To determine the educational needs of primary care healthcare professionals (doctors, dietitians) in England with regards to hydration and health.
- To pilot and evaluate an education package on 'hydration education and health'.

The partnership between NNEdPro and Danone Waters aims to determine the current state of hydration knowledge among primary care healthcare professionals. This information will then be used to create a hydration and health education package which can be piloted as a tool to increase awareness.

This work is linked with the Hydration for Health Initiative, with the mission: to raise public awareness of healthy hydration, and encourage sustainable healthy hydration habits, by sharing scientific research, educational materials and practical tools. Nutritional advice typically focuses on food intake. Yet, the quantity and quality of the fluids we drink every day can have a significant impact on our well-being and long-term health. Therefore, one of our primary challenges is to communicate the fundamental need for healthcare policymakers and practitioners to proactively provide healthy hydration advice. www.h4hinitiative.com



Theme 2: Patient Safety, Health Services and Public Health

Improving the identification, prevention and management of malnutrition risk in patients and the public.

Hospital Malnutrition Review: Descriptive clinical epidemiology article published in Clinical Nutrition: Malnutrition in Healthcare Institutions. **COMPLETE**

Linked Collaborative Initiatives: Projects based in Ontario (Canada) as well as Maharashtra and West Bengal (India). **ONGOING**

NHS Partnership Working: The NNEdPro group has developed expertise around evidence synthesis to inform nutrition education and training components of NHS nutritional care pathways. The group continues to be consulted by NHS Primary and Secondary Care organisations to translate this evidence into knowledge that can inform policy and practice. **ONGOING**

Theme 3: Evidence Based Management and Prevention of Disease

Developing/translating evidence underpinning the role of nutrition in non-communicable disease prevention and management.

3a. Nutrition and Non Communicable Disease Prevention and Management

- **Cardiovascular/Metabolic Risk Management:** This work-stream is undertaken via a Nutrition and Vascular Studies (NVS) Platform which is part of the Medical Academic Portfolio of Prof Sumantra Ray at the MRC Elsie Widdowson Laboratory in Cambridge. *See next page for further details.* **ONGOING**
- **Integrated NCD Risk Management:** This proposed work-stream aims to take an integrated approach to understanding the role of nutrition in the prevention and management of major NCDs including Cancer as well as other chronic illnesses. **Planned**

3b. Good Research Practice/Methods Training for Healthcare and Research Professionals (including Nutritionists and Dietitians)

- **Research Methods Training Toolkit:** Prof Sumantra Ray is Editor of the Oxford Handbook of Clinical and Healthcare Research, working closely with Sue Fitzpatrick (former Head of Education and Training, Institute of Clinical Research) and others, to deliver training on research skills following the launch of the Oxford Handbook in 2015. Additionally, various aspects of quantitative and qualitative research continue to be used as part of a 'Mixed Methods Approach' across NNEdPro projects and initiatives and some of these are highlighted in individual papers/reports. **ONGOING**

Nutrition and Vascular Studies (NVS) and Cardiovascular / Metabolic Risk Management

Developing/translating evidence underpinning the role of nutrition in cardiovascular/non-communicable disease prevention and management.

Cardiovascular disease (CVD) remains the leading cause of both morbidity and mortality. There is increasing evidence highlighting the complex relationships between diet and CVD, particularly in the context of the current obesity epidemic. However, key knowledge gaps remain in application of emerging evidence to healthcare practice. NNEdPro Theme 3a seeks to mitigate such knowledge gaps using a translational approach.



As part of Theme 3a, NNEdPro interfaces with the **Nutrition and Vascular Studies (NVS) Platform/Team** led by Prof Sumantra Ray (NNEdPro Chair), in his role as Senior Clinician Scientist as well as National Diet and Nutrition Survey Lead Clinician, at the MRC Human Nutrition Research (HNR) unit in Cambridge. The NVS team focuses on the development and synthesis of translatable evidence as well as strengthening methodology, underpinning the ability to investigate and define the place of nutrition in cardiovascular prevention/management. The NVS team also has a particular interest in understanding how diets rich in (or supplemented with) fruit, vegetables and phytonutrients can modulate cardio-metabolic pathways in at-risk populations.

NVS research has been facilitated at MRC HNR by the establishment of a state-of-the-art **Vascular Function Assessment Lab (VFAL)** dedicated to nutritional studies. The VFAL has developed bespoke Standard Operating Procedures for the measurement of macro- and micro-vascular as well as endothelial function in relation to nutrition interventions/exposures (i.e. Carotid Intimal Media Thickness, Flow Mediated Dilatation, Pulse Wave Analysis/Velocity, Ambulatory Blood Pressure, Digital Electrocardiography, Laser Doppler Iontophoresis and other complementary measures). Ongoing method development work in the VFAL ensures enhanced precision in the detection of vascular changes relating to nutrition.

Based on NVS work, the NNEdPro group aims to translate key findings and other supporting evidence from the wider literature, particularly into educational innovations (incorporating impact assessment) for healthcare professionals.

Key NVS Projects at MRC HNR (linked with NNEdPro Theme 3a):

Strand (A) EXPERIMENTAL: Phytonutrients and Vascular Function

- Two linked Randomised Controlled Trials (University of Dundee) of berry intake and effects on vascular/endothelial function and metabolic risk as well as UV protection.
- Randomised controlled trial looking at the effects of a wide range of fruit and vegetable extracts on vascular/endothelial function and metabolic risk.
- Vascular function sub-study linked with a metabolic trial of green tea/coffee polyphenols.
- Vascular function acute trial comparing techniques using a hazelnut extract intervention.
- Vascular function study of patients undergoing an acute and intensive weight loss intervention.

Strand (B) EPIDEMIOLOGICAL: Population Diets, Nutrition and Cardiovascular/Metabolic Risk

- Longitudinal analyses of dietary patterns and vascular function in the 1946 British birth cohort or National Survey of Health and Development (NSHD), including derivation of novel intermediates from stored samples.
- Cross-sectional analyses of diet and cardiometabolic risk data collected in the UK National Diet and Nutrition Survey. In collaboration with the Centre for Diet and Activity Research.
- Clinical audit of cardiometabolic outcomes from the Intensive Weight Management Programme at the Addenbrooke's Hospital Obesity Clinic.
- Advisory role on: (i) dietary aspects of population/cohort studies in South London led by the School of Public Health at Imperial College London; (ii) vascular aspects of proposed population/cohort studies at the University of Western Australia; (iii) blood pressure and cardiometabolic risk in a community based weight loss intervention across England.

Strand (C) TRANSLATIONAL: Evidence Synthesis and Knowledge Exchange for researchers and/or Practitioners

- Evidence synthesis and translation (University of Dundee) of knowledge on the Nutritional Management of Ischaemic Stroke, Heart Failure and Raynaud's phenomenon.
- Evidence synthesis and knowledge exchange, including key contributions to the second edition (2016) of the Task Force on Cardiovascular Disease: Diet, Nutrition and Emerging Risk Factors by *British Nutrition Foundation*.
- Development of a UK consensus forum on vascular measures in nutritional studies and method development to improve precision (including the role of hydration status measures). [Relevant to Researchers]

KEY NVS RESEARCHERS

Prof Sumantra Ray: NVS work is part of the *Research and Innovation* section in the Medical Academic Portfolio at the MRC Human Nutrition Research unit in Cambridge. The healthcare translation focus in NVS is strengthened both by NNEdPro as well as Dr Ray's clinical role within the Cardiovascular and Metabolic Directorate of Addenbrooke's Hospital (part of the NIHR Cambridge Biomedical Research Centre and a member of Cambridge University Health Partners).

Prof Daniele Del: a key collaborator and NVS Co-Principal Investigator across a number of projects. The Del Rio Group brings cutting edge expertise in the characterisation of phytonutrients, bioactives and related biomarkers, complementing the VFAL technology at MRC HNR.

Dr Jane Maddock: a Registered Public Health Nutritionist, and Postdoctoral Scientist in Nutritional Epidemiology

Marietta Sayegh: Associate Nutritionist with Master's training in Cardiovascular Science

Dr Mike Newell: MRC Research Manager and Exercise Physiologist

Melina Tsiountsioura: Study Co-ordinator and Research Nutritionist

Sarah Gibbings and Matt Harvey: MRC Research Assistants

Ken Bell (BSc): MRC Placement Student

Dr Rajna Golubic (Clinical Epidemiologist), **Dr Virginia Tomatis** (Nutrition Scientist), and **Gabriele Mocciaro** (Intern), contribute to specific NVS projects.

Theme 4: Value through Partnerships

Applying knowledge/expertise from (1) to (3) through partnership working with relevant organisations at the public and patient interface.

Note: This theme represents guiding principles on the incorporation of partnership working across Themes (1) to (3) and details of individual projects/initiatives can be found under those themes.

Theme 5: Supporting Workforce Capacity

Evaluating the immediate and longer-term impact of (1) to (3), in relation to capacity building in the nutrition and healthcare workforce.

Note: This theme represents guiding principles on the incorporation of workforce capacity considerations across Themes (1) to (3) and details of individual projects/initiatives can be found under those themes.

Theme 6: NNEdPro Global

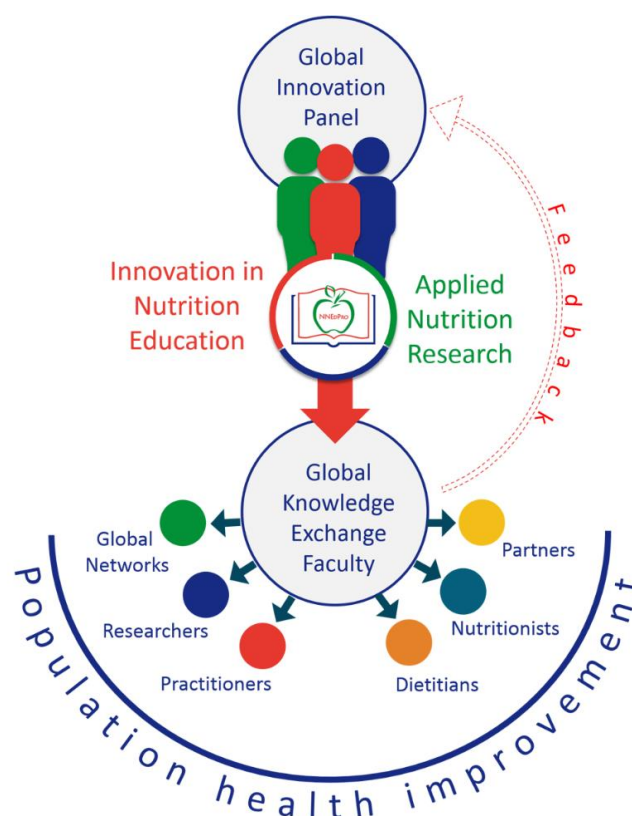
To promote international initiatives and knowledge exchange in nutrition, relevant to clinical and public health practice for medical and health professionals.

Global Innovation Panel (GIP)

The GIP is led by Dr Lauren Ball and Celia Laur, and NNEdPro Chair, Prof Sumantra Ray. The GIP oversees international initiatives and projects across a number of regions with the ultimate goal of knowledge transfer to medical/healthcare practitioners to improve population health.

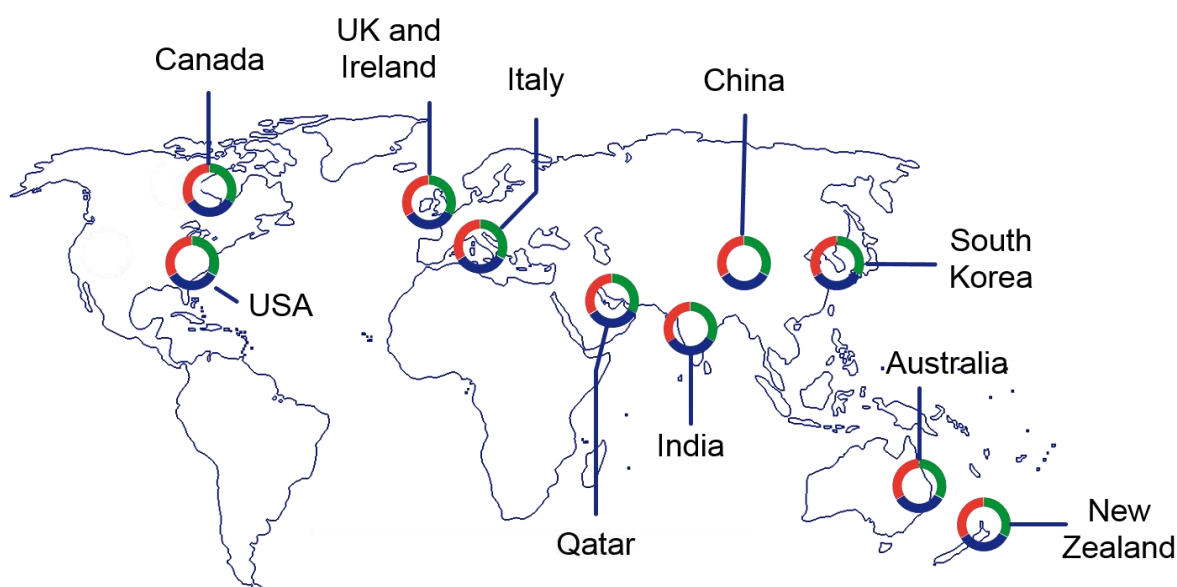
Global Knowledge Exchange Faculty

The work of the GIP is complemented by the NNEdPro Global Knowledge Exchange Faculty (GKEF) which is drawn from the members of the NNEdPro Group as well as key regional partners. The GKEF organises knowledge exchange events and meetings in countries with existing or emerging GIP collaborations. The GKEF is truly international in its reach and ensures that there is ongoing evidence based knowledge exchange and transfer involving a broad range of medical/healthcare professionals both within and across borders. The map below shows countries where GKEF activities have taken place to date.



Global Networks

Our map of the NNEdPro Global Networks across different regions can be found below. These regions have certain common denominators in terms of educational medium, healthcare practice norms as well as healthcare gaps around nutrition.



Network in India

In February 2015 the NNEdPro Network in India was formally launched at the inaugural meeting of the Commonwealth Association of Dietitians and Nutritionists, a satellite event of the 2015 World Congress on Public Health; this network (overseen by the NNEdPro Core Team and GIP), has separate membership and further details can be provided upon request. Dr Sagarika Mukherjee (Consultant Endocrinologist) and members of the Remedy Clinic Study Group in Kolkata, provide local leadership to the NNEdPro Network in India.

Remedy Clinic Study Group – NNEdPro’s regional agency in India/South Asia (Ongoing since Spring 2014): Presentations to BR Singh Hospital and at Pan Asia Continental in Kolkata with accompanying needs assessment survey (Spring 2014): Key paper published. 2015 World Congress on Public Health, Inaugural Meeting of the Commonwealth Association of Dietitians and Nutritionists as well as satellite events at Indian academic institutions via the Remedy Clinic Study Group: Presentations, workshops and lecture series (Spring 2015).

Network in Australia and New Zealand

In February 2015 the NNEdPro Network in Australia and New Zealand was formally agreed and is due to be launched formally in March 2016. Collaborations with Griffith University and University of Auckland have been established.

Emerging Regions of Interest

Brazil, China, Italy, Morocco/Middle East, Myanmar, South Korea and USA

Italy

- University of Parma: Presentation to Medical and Nutrition Faculties in Parma 2013.
- Food and Agriculture Organisation/World Health Organisation in Rome (Autumn 2014): Input to the 2014 Global Nutrition Report.

Qatar

- Anti-Doping Lab of Qatar – Nutrition/Life Sciences Research (Spring 2014): Presentation to ADLQ and University of Qatar

USA

- American Society for Nutrition (Ongoing since Spring 2013): Presentations to the American Society for Nutrition Conference at Experimental Biology in Boston 2013, San Diego 2014 and Boston 2015.
- University of North Carolina at Chapel Hill (Ongoing since Spring 2014): Presentation to the Gillings School of Public Health.
- United Nations General Assembly in New York (Summer 2014): Presentation to the Non Communicable Diseases Strategy Panel.

How can we spread our message?

International Summit on Medical Nutrition Education and Research

August 2015

A summary page of the Inaugural International Summit 2015 in Cambridge is now available online. At this event we gathered an international audience to share information, identify common issues and plan for the future. Here are some of the main aims of the 2015 Summit:



SHARE

- Share information on the current state of medical nutrition education and associated research in each region
- Share examples of learning from each region, including examples of successful and unsuccessful initiatives and actions



IDENTIFY

- Identify common or shared needs across regions
- Identify opportunities for joint strategies in medical nutrition education



PLAN

- Showcase examples of transferable models of strategies across regions

From the 2015 International Summit we will produce a summary publication showcasing the discussions and key messages arising. This novel publication will also include common needs across borders and identify joint strategies. Ongoing dissemination of insights arising from this summit will also occur through a variety of methods, including international conferences.

Email for further information on the 2016 International Summit and to register your interest: NNEdPro.Group@mrc-hnr.cam.ac.uk

Publications and Presentations

Journal Papers

1. Guest Academic Editor for a 2015 Special Issue (Nutrition Education of Healthcare Professionals) of the Journal of Biomedical Education (17 articles including Editorial by Kohlmeier M, Nowson CA, DiMaria-Ghalili, RA, Ray S).
2. Kohlmeier M, Nowson CA, DiMaria-Ghalili RA, Sumantra Ray. (2015) Editorial: Nutrition Education for the Health Care Professions. *Journal of Biomedical Education* 2015.
3. Ray S, Rajput-Ray M, Ball L, Crowley J, Laur C, Roy S, Agarwal S, Ray S (2015) Confidence and Attitudes of Doctors and Dietitians towards Nutrition Care and Nutrition Advocacy for Hospital Patients in Kolkata, India. *Journal of Biomedical Education* 2015.
4. Douglas P, Ball L, McGuffin L, Laur C, Crowley J, Rajput-Ray M, Gandy J, Ray S (2015) Hydration: Knowledge, Attitudes, and Practices of UK Dietitians. *Journal of Biomedical Education* 2015.
5. Douglas P, McGuffin L, Laur C, Burnett K, Ray S, McCarthy H. (2015) Pilot Evaluation of a Nutrition Training Intervention for Pre-Registration Pharmacists in Northern Ireland. *The FASEB Journal*, 2015.
6. Douglas P, McGuffin L, Fitzpatrick L, Ball L, Crowley J, Laur C, Rajput-Ray M, Gandy J, Ray S. (2015) Hydration and Dietetic Practice in the United Kingdom. *The FASEB Journal*, 2015.
7. Fitzpatrick L, Sayegh M, Ray S. (2015) Nutrition in the University of Cambridge Medical Curriculum – Student Perspectives. (2015) *The FASEB Journal*, 2015.
8. Kris-Etherton P.M, Akabas S.R, Douglas P, Kohlmeier M, Laur C, Lender C.M, Levey M.D, Nowson C, Ray S, Pratt C.A, Seidner D.L, Saltzman E. (2014) Nutrition Competencies in Health Professionals' Education and Training: A New Paradigm. *Advances in Nutrition*, 2014.
9. Crowley J, Ball L, Laur C, Wall C, Poole P, Ray S. (2014) Nutrition guidelines for undergraduate medical curricula: a six country comparison. *Advances in Medical Education and Practice*, 2014.
10. Ray S, Laur C, Douglas P, Rajput-Ray M, van der Es M, Redmond J, Eden T, Sayegh M, Minns L, Griffin K, McMillan C, Adiamah A, Gillam S, Gandy J. (2014). Nutrition Education and Leadership for Improved Clinical Outcomes: Training and supporting junior doctors to run a "Nutrition Awareness Weeks" across three English hospitals. *BMC Medical Education*, 2014.
11. Kris-Etherton P, Akabas S, Bales C, Bistran B, Braun L, Edwards M, Laur C, Lenders C, Levy M, Palmer C, Pratt C, Ray S, Rock C, Saltzman E, Seidner D, and Van Horn L. (2014) The Need to Advance Nutrition Education in the Training of Health Care Professionals and Recommended Research to Evaluate Implementation and Effectiveness. *American Journal of Clinical Nutrition Supplement*, 2014.
12. Ball L, Crowley J, Laur C, Rajput-Ray M, Gillam S, Ray S. (2014) Nutrition in Medical Education: Reflections from an initiative at the University of Cambridge. *Journal of Multi-disciplinary Healthcare*, 2014. Online Video Abstract
13. Ray S, Laur C, & Golubic R. (2013) Malnutrition in healthcare institutions: A review of the prevalence of under-nutrition in hospitals and care homes since 1994 in England. *Clinical Nutrition*.
14. Ray S, Laur, C, Rajput-Ray, M, & Douglas, P. (2013). Nutrition and fluid balance must be taken seriously. *BMJ Rapid Response* February, 2013.

15. Ray S, Laur C, NNEdPro Group. (2013) Need for Nutrition Education Programme: Laying the foundations of nutrition knowledge relevant to clinical and public health practice. *FASEB*. Online
16. Ray S, Udumyan R, Rajput-Ray M, Thompson B, Lodge K-M, Douglas P, Sharma P, Broughton R, Smart S, Wilson R, Gillam S, van der Es M, Fisher I, Gandy, J. (2012) Evaluation of a novel nutrition education intervention for medical students from across England. *BMJ Open*, vol 2 no 1. doi:10.1136/bmjopen-2011-000417.
17. Laur C, Thompson B, & Ray S. (2012) Short but effective educational interventions in medicine and healthcare – lessons learnt from the “Need for Nutrition Education Programme.” *MedEdWorld*.
18. Ray S, Laur C, Rajput Ray M, Gandy J, & Schofield S. (2012) Planning Nutrition Education Interventions for the Medical Workforce: “Nutrition Education Workshop for Tayside Doctors” (NEWTayDoc) – A pilot project to inform development of the Need for Nutrition Education Programme (NNEdPro). *MedEdWorld*.
19. Charlesworth, K. E., Ray, S., Head, F., & Pencheon, D. (2012). Developing an environmentally sustainable NHS: outcomes of implementing an educational intervention on sustainable health care with UK public health registrars. *New South Wales Public Health Bulletin*, vol 23 no 1-2, 27–30. doi:10.1071/NB11018.
20. Ray S, Gandy J, Landman J. (2008) The Doctor as a Nutritionist, A Discussion Paper on Nutrition in Medical Careers. Westminster Forum Projects.

Chapters and Books

21. Markell M, Ray S, Douglas P, Fitzpatrick L (In Progress, 2017). Basic Nutrition Textbook for Medical Students.
22. Ray S, Fitzpatrick S et al (Oxford University Press, 2015). Oxford Handbook of Clinical and Healthcare Research.
23. Webster-Gandy J (Editor & Contributor) Manual of Dietetic Practice 5th Edition (2014).
24. J Webster-Gandy, AM Madden & M Holdsworth. (2006; 2nd Edition 2011) Oxford Handbook of Nutrition & Dietetics Oxford University Press.
25. Webster-Gandy, J. (2000, last revised 2013) Understanding Food & Nutrition, Family Doctor Series, published in Association with the British Medical Association.

Conference Abstracts and Presentations

26. *Annual Research Symposium of the British Dietetic Association – Birmingham, UK – 1 abstract*
27. International Conference of Primary Care and Public Health. Can a novel training intervention for General Practitioners improve hydration knowledge for better Healthcare? A Knowledge, attitude and practice study. (2015). Imperial College London, UK
28. International Conference of Primary Care and Public Health. Strategic partnership for knowledge generation, translation and evaluation. (2015). Imperial College London, UK
29. International Conference of Primary Care and Public Health. Variability and relationships between central and peripheral Blood Pressure in a Nutrition and Vascular Risk Trial – potential lessons for the clinic. (2015). Imperial College London, UK
30. International Conference on Polyphenols and Health. (2015). Are habitual fruit consumption or hydration status modulators of baseline endothelial function and is this important for polyphenol intervention studies? Tours, France

31. European Federation of Associations of Dietitians Conference. (2015). Opportunities for dietitians in hydration and patient care. Amsterdam, Netherlands
32. European Federation of Associations of Dietitians Conference. (2015). Hydration: Assessment of student dietitians' knowledge, attitudes and current/potential future practices. Amsterdam, Netherlands
33. Cambridge Institute for Public Health Conference. (2015). THE 'NELICO' India Project: building research capacity in public health initiatives – from local to global. Cambridge, UK
34. Ball L, Ball D, Leveritt M, Ray S, Collins C, Patterson E, Ambrosini G, Lee P, Chaboyer W. (2015) Using logic models to enhance the methodological quality of primary health care interventions (poster). Gold Coast Health and Medical Research Conference, Gold Coast.
35. American Society for Nutrition Conference at Experimental Biology (2015). Presentations at the Meeting of New England/Mid-Atlantic Regional Medical School Educators.
36. American Society of Nutrition conference (2014). Presented as two talks as part of the Official Scientific Programme, *Nutrition Competencies in Health Professionals' Education and Training: A New Paradigm*.
37. American Society of Nutrition conference (2013). Abstract selected for oral presentation, entitled *Need for Nutrition Education Programme: Laying the foundations of nutrition knowledge relevant to clinical and public health practice*.
38. Irish Society for Clinical Nutrition and Metabolism conference (2013). Abstract selected for poster presentation, entitled 'Need for Nutrition Education Programme: Laying the foundations of nutrition knowledge relevant to clinical and public health practice.
39. BAPEN Conference (2010). The Need for Nutrition Education Project (NNEdPro) – An educational intervention across UK Medical Schools to lay the foundations for good nutritional care. This poster received the 2010 Nutrition Society prize.
40. ASME Conference (2010). The Need for Nutrition Education Project (NNEdPro) – A potential vehicle for educational innovation and change across UK Medical Schools.
41. ICGN Presentation (2010). Laying the foundations of Nutrition Knowledge, Attitudes and Practices in a cohort of 'Tomorrow's Doctors'.
42. BDAC Oral Presentation (2010). The impact of a nutritional education intervention on undergraduate medical students.
43. ICR conference (2009). Use of a modified, controlled before and after (CBA) study design to investigate the effectiveness of a clinical nutrition education intervention in tomorrow's doctors.

Invited Presentations

44. 'Back to Basics in Nutrition' EXPO (2015) Milan, Italy.
45. 'NNEdPro from Local to Global' (2015). WHO Collaborating Centre at Imperial College London.
46. World Congress on Public Health, Commonwealth Dietitians and Nutritionists Association and associated lecture series in the East of India (2015). 'Nutrition education and Leadership for Improved Clinical/Public Health Outcomes' (NELICO) in India.
47. Dietetic Education Session Workshop (2014). Addenbrookes Hospital, Cambridge.

Reports and Teaching Resources

48. Summary in the British Dietetic Association Impact Report, 2009-2012. Building a Healthier Britain.
49. NELICO Final Report – Phase 2 (August 2010 – December 2012) Nutrition Education and Leadership for Improved Clinical Outcomes: Training and supporting junior doctors to run a ‘Nutrition Awareness Week’ across three English hospitals
50. NELICO Teaching Manual 2012.
51. NNEdPro Final Report – Phase 1 (December 2008 – July 2010). The Need for Nutrition Education Programme report.
52. NNEdPro Teaching Manual 2011

Newsletters

53. Complete Nutrition Articles:
 - Complete Nutrition (June 2016) Nursing Essay Competition 2016.
 - Complete Nutrition (May 2016) NNEdPro Australia and New Zealand Network Launch.
 - Complete Nutrition (April 2016) An Evidence-based ‘gut feeling’: Dietary polyphenols and the gut microbiome.
 - Complete Nutrition (February/March 2016) Local Innovation with Global Impact: International initiatives in nutrition education and related research.
 - Complete Nutrition (December 2015) The Need for Nutrition Education/Innovation Programme: Who are we?
 - Complete Nutrition (October 2015) Same Challenge- different countries- common voice!
 - Complete Nutrition (June 2015) NNEdPro at the World Congress on Public Health 2015.
 - Complete Nutrition (May 2015) Strengthening doctors’ nutrition knowledge and education.
54. BMA Blog (2015) Let Food Be Thy Medicine.
55. Newcastle University (2013) Students start their PIPS.
56. Perspectives in Public Health (2013) ‘Five Year Update: The Need for Nutrition Education Programme’.
57. Nutrition Newsletters (2013) Sugar Nutrition, The Need for Nutrition Education Programme.
58. BMA News (2012) Call for Improved Nutrition Teaching (October 27, 2012).
59. BMA News (2012) Juniors Promote Nutrition Campaign.
60. BMA Student News (2011) Need for Nutrition Education Programme.

Public Engagement

61. Salt Reduction Seminar (2015). Session Chair. Food Matters Live, London.
62. Healthy Eating in Schools (2015). Toni Steer at Sancton Wood School, Cambridge.
63. Cambridge News (2014). What you need to know about fruit and vegetables.
64. Sizzling Science with Added Spice (2011). Cooking, science and history all rolled into one!

Nutrition (Dietary Bioactive) and Vascular Studies (Cardiovascular Risk) Publications

Journal Papers

1. Curti, C., Brindani, N., Battistini, L., Sartori, A., Pelosi, G., Mena, P., Brighenti, F., Zanardi, F. & Del Rio, D. (2015) Catalytic, Enantioselective Vinylogous Mukaiyama Aldol Reaction Of Furan-Based Dienoxy Silanes: A Chemodivergent Approach To Γ -Valerolactone Flavan-3-Ol Metabolites And Δ -Lactone Analogues. *Advanced Synthesis & Catalysis*.
2. Ray S et al (2015). Can antioxidant-rich blackcurrant juice drink consumption improve photoprotection against ultraviolet radiation? *British Journal of Dermatology*
3. Maddock J, Abmrosini G, Koulman A, Ray S. (2015) A Proposed Epidemiological Approach to Investigate Mechanisms between Diet and Vascular Function. *The FASEB Journal*, 2015.
4. Tsiountsioura M, Sayegh M, Ray S. (2015) Does Habitual Fruit Consumption Modulate Microvascular Endothelial Function in Healthy Human Participants? *The FASEB Journal*, 2015.
5. Sayegh M, Ray S. (2015) Potential Modulation of Vascular Function Relating to Baseline Hydration Status in Healthy Human Participants in a Randomised Controlled Trial. *The FASEB Journal*, 2015.
6. Ray S, Nicholson S, Ziauddeen N, Steer T, Cole D, Solis-Trapala I, Amoutzopoulos B, Page P. (2015) What do we know about fruit and vegetable consumption in the UK? Trends from the National Diet and Nutrition Survey Rolling Programme (NDNS RP). *The FASEB Journal*, 2015.
7. Tomatis V, Ray S, Siervo M, Griffin J, Bluck L. (2015) Effects of Green Tea and Coffee Polyphenols on Cardiometabolic Function in Women with Polycystic Ovary Syndrome. *The FASEB Journal*, 2015.
8. Jones N, Ray S, Monsivais P. (2015) The DASH Diet, Cardiovascular Disease Risk and Obesity in the United Kingdom. *The FASEB Journal*, 2015.
9. Ray S, Nicholson S, Roberts C, Page P. (2014) UK National Diet and Nutrition (NDNS) Survey: ad-hoc cross-sectional survey to sustainable Rolling Programme (RP) for surveillance (Y6-9 2013-17). *The FASEB Journal*, 2014.
10. Sayegh M, Ray S. (2014) Acute hydration status and micro-vascular function in healthy human volunteers. *The FASEB Journal*, 2014.
11. Zanutti I, Dallasta M, Menaparro P, Mele L, Bruni R, Ray S, Del Rio D. (2014) Atheroprotective effects of (poly)phenols: focus on cell cholesterol metabolism. *Food and Function*, 2014.
12. Bresciani L, Calani L, Cossu M, Mena P, Sayegh M, Ray S, Del Rio D. (2015) (Poly)phenolic characterization of three food supplements containing 36 different fruits, vegetables and berries. *PharmaNutrition*.
13. Khan F, Ray S, Craigie A.M, Kennedy G, Hill A, Barton K.L, Broughton J. & Belch, J.J. (2014) Lowering of oxidative stress improves endothelial function in healthy subjects with habitually low intakes of fruit and vegetables: A randomized controlled trial of antioxidant- and polyphenol-rich blackcurrant juice. *Free Radic Biol Med*, 2014.
14. Ray S, Miglio C, Eden T, & Del Rio D. (2014) Assessment of vascular and endothelial dysfunction in nutritional studies. *Nutrition, Metabolism and Cardiovascular Diseases*. doi: 10.1016/j.numecd.2014.03.011

15. Sayegh M, Miglio C, & Ray S. (2014) Potential cardiovascular implications of Sea Buckthorn berry consumption in humans. *International Journal of Food Sciences and Nutrition*. doi:10.3109/09637486.2014.880672
16. Dall'Asta M, Derlindati E, Curella V, Mena P, Calani, L, Ray S, Zavaroni I, Brighenti F, Del Rio D (2013). Effects of naringenin and its phase II metabolites on in vitro human macrophage gene expression. *International Journal of Food Sciences and Nutrition*. vol 64 no 7, 843–9. doi:10.3109/09637486.2013.804039
17. Bresciani L, Calani L, Bocchi L, Delucchi F, Savi M, Ray S, Brighenti F, Stilli D, Del Rio D. (2013) Bioaccumulation of resveratrol metabolites in myocardial tissue is dose-time dependent and related to cardiac hemodynamics in diabetic rats. (2013) *Nutr Metab CardiovascDis*. doi:10.1016/j.numecd.2013.09.008.
18. Eden T, Sayegh M, Ray S. (2012) Diagnosis and management of Raynaud's phenomenon. *BMJ* (Rapid Response Published 14 February 2012)
19. The Scottish-Finnish-Swedish PARTNER study of taprostene versus placebo treatment in patients with critical limb ischemia. (2011) Belch JJ, Ray S, Rajput-Ray M, Engeset J, Fagrell B, Lepäntalo M, McKay A, Mackay IR, Ostergren J, Ruckley CV, Salenius J. *Int Angiol*. 2011 Apr;30(2):150-5. PMID: 21427652.
20. Nutritional management of Stroke: From Current Evidence to Conjecture. (2007) Ray S, Rana P, Rajput M, Haleem MA. *Nutrition Bulletin*, vol. 32, no. 2, pp. 145–153, 2007.

Chapters and Books

21. Ray S et al British Nutrition Foundation Cardiovascular Task Force (Wiley, 2016). *Diet and Cardiovascular Disease*. 2nd Edition.
22. Eden T, Rajput-Ray M and Ray S. (2014) Cambridge University Press, *Nutrition in Critical Care*. Chapter: Micronutrient and vitamin physiology and requirements in critically ill patients.

Conference Abstracts and Presentations

23. Kelsey M,E, Golubic R, Livesy A, Connell C, Hoensch J, Laur C, Park A, Ray S. Clinical Effectiveness of the Intensive Weight Management Programme. *European Conference of Obesity (ECO)*.
24. Golubic R, Kelsey M.E, Livesy A, Connell C, Hoensch J, Laur C, Park A, Ray S. The Cambridge Intensive Weight Management Programme. *The 2015 Obesity Summit*.
25. Tsiountsioura M, Sayegh M, Ray S (2015). Does Habitual Fruit Consumption Modulate Microvascular Endothelial Function in Healthy Human Participants? Poster presentation at the American Society of Nutrition at Experimental Biology. Boston, USA. *Abstract published as short communication in the FASEB Journal*.
26. Sayegh M, Ray S (2015). Potential Modulation of Vascular Function Relating to Baseline Hydration Status in Healthy Human Participants in a Randomised Controlled Trial. Poster presentation at the American Society of Nutrition at Experimental Biology. Boston, USA. *Abstract published as short communication in the FASEB Journal*.
27. Maddock J, Abmrosini G, Koulman A, Ray S (2015). A Proposed Epidemiological Approach to Investigate Mechanisms between Diet and Vascular Function. Poster presentation at the American Society of Nutrition at Experimental Biology. Boston, USA. *Abstract published as short communication in the FASEB Journal*.
28. Golubic R, Kelsey M.E, Livesy A, Connell C, Hoensch J, Laur C, Park A, Ray S. The Cambridge Intensive Weight Management Programme. *The 2015 Obesity Summit*.

29. Sayegh M, Ray S (2014). Acute hydration status and micro-vascular function in healthy human volunteers. Poster presentation at the American Society of Nutrition at Experimental Biology. San Diego, USA. *Abstract published as short communication in the FASEB Journal.*

Invited Presentations

30. 'NNEdPro'- A Platform Bridging Research, Policy and Practice. Brighton-Sussex Medical School. October 2014.
31. Keynote presentation on NNEdPro and the NSHD Diet and CVD project (2015). British Medical Association Annual Research Awards. London, UK.
32. NNEdPro and CVD Research (2015). Centre for Public Health Symposium. Queen's University Belfast, UK.
33. 'NNEdPro'- A Platform Bridging Research, Policy and Practice. Brighton-Sussex Medical School. October 2014.
34. Presentation on Nutrition and Vascular Function to the Anti-Doping Lab of Qatar and University of Qatar (2014).
35. Cardiovascular nutrition for pharmacists, Universities of Ulster and Queen's Belfast (2014).

Newsletters

36. BMA News (2013) A Shared Will for Progress – Eating Your Way to a Healthy Heart.