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The Development of the European Masters Programme in Medical Imaging

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Purpose

The European Masters Programme in Medical Imaging (EMPIMI) aims to stimulate graduates to continue their studies and raise the knowledge and skills level in medical imaging. The programme will promote high quality practice and create career development opportunities.

The objectives of the programme are to enable students to:

- Acquire higher knowledge and advanced practical skills in the relevant fields of the medical imaging profession,
- Apply this knowledge in national and international settings, to improve existing working methods, to develop new working methods and to draw up diagnostic and treatment protocols,
- Increase analytical and critical reflective capacity,
- Communicate complex information with their own and related disciplines, with the aim to improve medical imaging health care services,
- Develop and carry out research projects.

Methods and Materials

- The European Masters Programme in Medical Imaging (EMPIMI) is a Joint Masters programme being developed by a consortium of six partner Universities from the Netherlands, Ireland, Lithuania, Malta and the United Kingdom (see figures 1-6). The project is supported by the Erasmus curriculum development scheme and has a start date of autumn 2010.
- The programme aims to educate and train students using innovative and multidisciplinary approaches, combining research and advanced practice in medical imaging with an overriding European focus.
- The total credit volume of the EMPIMI programme is 90 ECTS with two exit strategies available to those who do not wish to complete the full Masters programme. A Postgraduate Certificate upon successful completion of at least one compulsory module and up to 20 ECTS from other modules; a Postgraduate Diploma upon successful completion of 60 ECTS including all compulsory modules with the exception of the dissertation module.

- **Fig.**: EMPIMI Programme Structure
- The novel programme that is being developed under the EU Programme (Erasmus: Curriculum Development), will be a graduate course in medical imaging that will for the first time be available to individuals across Europe and beyond. Course participants will receive the latest information on the principles and applications of current and emerging imaging technologies and will be of value to clinicians, scientists and researchers. This type of programme that will be led by a multi-disciplinary and multi-institutional team will embrace the cultural, practice and legislative variations across Europe and will be current, topical, relevant and necessary. The changing face of medical imaging and the increasing movement within the EU insists that such a course needs to be available.

Results

Graduates will have the ability to apply the acquired knowledge in both national and international contexts, and to integrate research, professional development and policies at an advanced level. In keeping with the European Higher Education Area and European Higher Education Framework, EMPIMI will provide knowledge, skills and competences.

In addition to the opportunities for increased mobility for students and staff, shared teaching and learning between institutions will also be fostered. The programme will focus on key issues that determine the future challenges of Medical Imaging throughout Europe: improved quality, attractiveness and accessibility of the lifelong learning opportunities available within EU member states, and increased transparency and compatibility between higher education and advanced vocational education qualifications gained in Europe.

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Programme Learning Outcomes and Graduate Attributes:

1 Knowledge and understanding

Knowledge and understanding provide a basis and opportunity for originality in developing or applying ideas in a research context.

1.1. Graduates will be able to identify, formulate, plan, develop and conduct independently or semi independently medical imaging research, choose appropriate methodological and analytical tools to analyse and interpret data (using quantitative and qualitative approaches)

1.2. Graduates will have demonstrated the ability to improve and innovate and to determine the fundamental issues of medical imaging, through the study of medical imaging science

1.3. Graduates will use specialised theoretical and practical knowledge some of which is at the forefront of knowledge in medical imaging. This knowledge forms the basis for originality in developing and/or applying ideas

1.4. Graduates will have demonstrated critical awareness of knowledge issues in medical imaging and at the interface between different fields

Dependent on whether their pathway choice includes practical components.

1.5. Graduates will have demonstrated the ability to use advanced practical skills in the relevant field of medical imaging

1.6. Graduates will have in-depth theoretical knowledge, deeper insight and advanced clinical skills

2 Applying knowledge and understanding

Applying knowledge and understanding through problem solving abilities in new or unfamiliar environments within broader contexts.

2.1 Graduates will have the ability to develop within their profession, apply their knowledge to new applications and explore new fields

2.2 Graduates will be able to apply knowledge and understanding (of appropriate research methodology and methods) that lead to originality in identifying, formulating, planning, developing and conducting, independently or semi-independently, medical imaging research

2.3 Graduates will be committed to improve and innovate practice and services based on current theories of medical imaging science, a deeper understanding of relevant EU social and health care legislation in relation to effective medical imaging practice

2.4 Graduates will apply scientific methods in practice, and critically appraise strategies that enable practitioners to manage change and promote quality care

2.5 Depending of the composition of their study programme graduates will be competent to:

- take up positions with more challenging responsibilities for the practical organisation and management of their departments
- where appropriate, act as clinical experts undertaking role development in the context of the wider medical environment
- act as clinical investigator in setting up research protocols for the evaluation of new methodologies, techniques and equipment
- act as expert in the development of quality control procedures, the surveillance of the total quality chain in the department and the implementation of radiation safety measures
- act as consultants or liaison officers giving feed back to industry and input to public health authoritie

3 Making judgements

Making judgements demonstrates the ability to integrate knowledge, handle complexity, formulate judgments with incomplete data and requires being capable of critical analysis.

3.1 Graduates will have the ability to integrate knowledge from their own and other professions in order to handle complexity

3.2 Graduates will critically appraise literature in order to evaluate the relationship between illness, medical imaging and health status

3.3 Graduates will analyse and compare the professional role of medical imaging practice and research in different countries within the wider context of healthcare settings and demonstrate a broad and deep vision of a European dimension of medical imaging in relation to other visions

3.4 Graduates will demonstrate a broad and deep vision of medical imaging and will be able to determine the fundamental issues in medical imaging.

3.5 Graduates will possess competences and will be able to evaluate the effects of different European countries on medical imaging practice and health

4 Communication

Communication of conclusions and the underpinning knowledge and rationale to specialist and non-specialist audiences.

4.1 Graduates will be able to communicate their program outcomes, methods and underpinning rationale to specialist and non-specialist audiences using appropriate techniques

4.2 Graduates will be able to communicate their knowledge and understanding of their research findings

4.3 Graduates will be able to practice effectively and confidently across national borders and cultures

5 Learning skills

Learning to study in a manner that may be largely self-directed or autonomous.

5.1 Graduates will have skills such as self-reflection, clinical reasoning and the ability to manage complex problems

5.2 Graduates will use their knowledge and understanding of medical imaging and research, collaboratively as well as independently and autonomously

5.3 Graduates are versatile professionals with the ability to practice and adapt in challenging and rapidly changing environments

5.4 Graduates will undertake self study and be committed to lifelong learning through continuous professional development

Conclusion

The development of this programme is supported by all six partner institutions, the EU and the European Federation of Radiography Societies (EFRS). Much consultation has taken place over the past 24 months with academics, professionals, employers, and professional bodies across Europe with many identifying the need for such a programme. Currently in Europe many countries do not offer any graduate opportunities for medical imaging professionals and it is felt by the EMPIMI group and EFRS that this programme is ideally suited to further develop professionals in these countries who are eager to have the opportunity to do so.