

# Introduction of a module in inherited metabolic diseases for undergraduate medical students

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## Introduction

Chemical pathology and, in particular, inherited metabolic diseases (IMD) have traditionally not featured heavily in undergraduate medical curricula.

Misunderstandings around these subjects and fear that they are overly complicated may have contributed to difficulties recruiting post-graduate trainees into the speciality.

The use of 'Student Selected Components (SSCs)' in medical schools allows students to spend some time exploring an area that they are interested in.

We piloted an SSC entitled 'Inherited Metabolic Diseases in Children and Adults' for medical students at Queen's University in September 2019.

The SSC was re-run in January 2020, but has been suspended since on account of COVID-19 restrictions. 3 students enrolled each time.

## Staff Involved

- 1 Biomedical Scientist
- 1 Consultant Cardiologist
- 1 Consultant Geneticist
- 1 Midwife
- 1 Paediatrician
- 2 Clinical Scientists
- 2 Dietitians
- 2 Specialist Nurses
- 4 Consultant Chemical Pathologists

## Clinical/Laboratory Experience

- Adult IMD clinic
- Community midwife visit
- Duty biochemist session
- Lipid clinic
- Paediatric IMD clinic
- Regional neonatal screening laboratory
- Specialist metabolic laboratory

## Timetable

### Week 1

	Monday 13 <sup>th</sup> January	Tuesday 14 <sup>th</sup> January	Wednesday 15 <sup>th</sup> January	Thursday 16 <sup>th</sup> January	Friday 17 <sup>th</sup> January
<b>Session 1</b>	09.00-10.00 Introduction to course  Dr P Hamilton and Dr G Connolly  Seminar Room 2, Mulhouse Building, RVH	11.30-12.30 Tutorial: Introduction to IMD  Dr P Hamilton  Seminar Room 2, Mulhouse Building, RVH	09.00 – 12.30 Paediatric clinic  Dr G Connolly and Dr S O'Sullivan  Medical Outpatients, Royal Belfast Hospital for Sick Children	11.00-12.00 Tour of metabolic laboratory  Mr D Cardy  (Wait in Kelvin Building Foyer for Mr Cardy)	09.00-12.00 Community midwifery session (Newborn screening programme)  Venue to be confirmed with Ms McCormack on 16 <sup>th</sup> January afternoon
<b>Session 2</b>	Self-directed study	14.00-16.30 Adult clinic  Drs G Connolly, K Ryan and C Loughrey  Metabolic Outpatients, Level 8, Critical Care Building, RVH	Self-directed study	15.00-15.30 Allocation of community midwife placements  Ms M McCormack  Royal Jubilee Maternity Hospital (Go to office opposite Antenatal Clinic on ground floor).	13.00-14.00 Tutorial: Introduction to laboratory testing in metabolic disease  Ms G Hamilton  Seminar Room A, Kelvin Building, RVH (Wait in Kelvin Building Foyer for Ms Hamilton)

### Week 2

	Monday 20 <sup>th</sup> January	Tuesday 21 <sup>st</sup> January	Wednesday 22 <sup>nd</sup> January	Thursday 23 <sup>rd</sup> January	Friday 24 <sup>th</sup> January
<b>Morning</b>	09.00-12.00 Lipid clinic  Drs K Ryan and P Hamilton  Level 7, Outpatients Building, RVH	10.00-11.00 Tutorial: Homocystinuria  Dr K Ryan  Seminar Room 2, Mulhouse Building, RVH	09.00 – 12.30 Paediatric clinic  Drs G Connolly and S O'Sullivan  Medical Outpatients, Royal Belfast Hospital for Sick Children	11.00-12.00 Tour of screening laboratory  Mr D Cardy  (Wait in Kelvin Building Foyer for Mr Cardy)	14.00-15.00 Tutorial: MCAD Deficiency  Dr G Connolly  Seminar Room A, Kelvin Building, RVH (Wait in Kelvin Building Foyer for Dr Connolly)
<b>Afternoon</b>	14.00-15.00 Tutorial: Galactosaemia  Dr S O'Sullivan  Medical Outpatients, Royal Belfast Hospital for Sick Children	14.00-15.00 Tutorial: Dietary management of IMD  Ms J McDonald and Ms N McStravick  Level 8, Critical Care Building, RVH	14.00-15.00 Tutorial: Phenylketonuria  Dr P Hamilton  Seminar Room 2, Mulhouse Building, RVH	14.00-15.00 Tutorial: The role of the metabolic nurse specialist  Ms Nicky Cluskey  Teaching room 2, Royal Belfast Hospital for Sick Children	Self-directed study

### Week 3

	Monday 27 <sup>th</sup> January	Tuesday 28 <sup>th</sup> January	Wednesday 29 <sup>th</sup> January	Thursday 30 <sup>th</sup> January	Friday 31 <sup>st</sup> January
<b>Morning</b>	09.00-12.00 Lipid clinic  Drs K Ryan and P Hamilton  Level 7, Outpatients Building, RVH (Building near Falls Road entrance)	10.00-11.00 Tutorial: Newborn screening programme  Dr J Cundick  Seminar Room 2, Mulhouse Building, RVH	09.00 – 12.30 Paediatric clinic  Drs G Connolly and S O'Sullivan  Medical Outpatients, Royal Belfast Hospital for Sick Children	10.00-11.00 Tutorial: Urea cycle disorders  Dr C Loughrey  Meet at Coffee Shop, Ground Floor, Belfast City Hospital	Self-directed study
<b>Afternoon</b>	14.00-15.00 Tutorial: Fabry Disease  Dr A Muir  Seminar Room, 10 South, Belfast City Hospital	14.00-16.30 Adult clinic  Drs G Connolly, K Ryan and C Loughrey  Level 8, Critical Care Building, RVH	14.00-15.00 Tutorial: Cascade screening for familial hypercholesterolaemia Ms M Cather Library, Medical Genetics Department, A-Floor, BCH  15.30-16.30 Tutorial: Genetic Counselling and Genome Sequencing for Metabolic Disorders Dr S McKee Library, Medical Genetics Department, A-Floor, BCH	14.00-15.00 Duty biochemist shadowing  Dr P Hamilton  Doctor's Office, Kelvin Building, RVH (Wait in Kelvin Building Foyer for Dr Hamilton)	14.00-15.00 End of course debrief and student presentations  Dr P Hamilton Dr G Connolly  Seminar Room 3 (note different venue to usual), Mulhouse Building, RVH

## Assessment

1. Students were individually asked to pick an IMD topic of particular interest to them, and to research a novel development in that field. They delivered a verbal presentation on the last day of the SSC to assembled staff members, and answered questions.
2. Students completed a 2500 reflective portfolio detailing their learning during the SSC.
3. A diary confirming attendance was completed

## Feedback

The module was well organised?

- 100% strongly agree

The module was stimulating?

- 100% strongly agree

*"Good balance of classroom and clinics"  
"I really enjoyed the diverse range of topics we got to cover. Overall really enjoyable"  
"I enjoyed the good mix of adult and paediatric clinical exposure, as well as an insight into the job of dietitians, midwives and lab pathologists."*

*"The sessions were so varied in nature!  
Reflective diary and presentation is an excellent form of assessment for this module."*

## Summary

An SSC is an excellent way to introduce IMD to a small number of medical students. Engaged and enthusiastic staff were key to the success of the SSC.

## Acknowledgements

Thank you to all colleagues who made the SSC possible!