Remote monitoring systems in the cancer setting: an overview of the Advanced Symptom Management System (ASyMS)

eSMART: Electronic Symptom Management using the Advanced Symptom Management System (ASyMS) Remote Technology for patients with cancer (Chief Investigator Professor Roma Maguire)

Catherine O’Brien, Advanced Nurse Practitioner, Dublin, Ireland

“This project has received funding from the European Union’s Seventh Framework Programme for research, technological development and demonstration under grant agreement number 602289.”
Aim

• To provide an overview of Advanced Symptom Management System (ASyMS) which is currently being evaluated as part of the eSMART study (clinicaltrials.gov) (NCT02356081)

• eSMART is a two-part, pragmatic, 5-year RCT being conducted in multiple sites across five countries (ie, Austria, Greece, Ireland, Norway and the UK)
Remote monitoring systems in the cancer setting

- Growing interest in the use of remote monitoring systems to enhance symptom assessment and management in the cancer setting
- Electronic patient reported outcomes (ePROs) allow for:
  - timely symptom reporting
  - rapid decision-making
  - interventions to improve patient outcomes

Basch 2016, Di Maio et al., 2016
Remote monitoring systems in the cancer setting

The main drivers:

• A shift in care delivery from traditional inpatient care to community settings

• Need for more regular and systematic approaches to symptom assessment

• Need for affordable solutions to the increasing demands placed on acute care

Research on remote monitoring systems:

(36 studies included, 2006-2016)

• Earlier studies: focused on feasibility, acceptability, usability

• More recent studies: focusing on clinical outcomes
Web-based self-reporting of symptoms (STAR) vs usual care

- n=766

- Symptom reporting via tablet computers (STAR) vs usual care (UC)

- Email alerts received when severe or worsening symptoms

- Primary outcome was change in health related quality of life (HRQoL)

Results:

[Graph showing comparison of HRQL, ER, Hospital adm, and survival between STAR and UC]
(n=358)  
Symptom Care at Home (SCH)  
Usual Care (UC)  

SCH participants received automated self-management coaching and nurse practitioner (NP) telephone follow-up for poorly controlled symptoms.

**Primary endpoint:**

symptom severity and the number of severe, moderate, mild, and no symptom days

**Results:**

Relative Symptom Burden ↓ 43%  
(P < 0.001)  

Symptom Days (severe) ↓ 67% less  
(moderate) ↓ 39%  
(both P < 0.001)
Advanced Symptom Management System (ASyMS): an electronic platform that enables remote patient monitoring through use of mobile phones in real time

Multi-centre study taking place across 5 countries in Europe
Austria, Greece, Ireland, Norway and the UK
Project overview

- Repeated-measures, parallel-group, stratified RCT
- Over $\geq$3 cycles of first-line chemotherapy plus 1-year follow-up

1,108 patients with breast cancer, colorectal cancer or lymphoma

Primary end-point:
- Symptom burden during CT

Secondary end-points:
- Symptom burden during FU
- HR-QoL (CT and/or FU)
- Needs for supportive care (CT and/or FU)
- Self-efficacy (CT and/or FU)
- Anxiety (CT and/or FU)
- Work absenteeism (CT and/or FU)
- Health service access costs
- Effects on processes of care delivery and clinical practice
Outcome measures

• Memorial Symptom Assessment Scale (MSAS)

• Functional Assessment of Cancer Therapy – General (FACT-G)

• Supportive Care Needs Survey SCNS-SF34

• State-Trait Anxiety Inventory – Revised (STAI-Y)

• Communication & Attitudinal Self-Efficacy Scale for Cancer (CASE-Cancer)

• EuroQol (EQ-5D)

• Work limitations Questionnaire (WLQ)

• Client Services Receipt Inventory (CSRI)

Qualitative evaluation

Baseline,
Pre each cycle of chemotherapy

Case note reviews

Do not duplicate or distribute without permission of ESO and the author
eSMART Model of Care

Personalised & anticipatory care

Real time data transfer

Self-care

Response

Amber Alert

Red Alert

Clinical risk algorithm
Patient completes daily symptom questionnaire

Data transferred to server & subject to clinical risk algorithm

Evidence based self-help advice

Amber alert

Red alert

Clinicin logs onto website and contacts patient

ASyMS utilises the Chemotherapy Toxicity self-Assessment Questionnaire (CTAQ) electronic Patient-Reported Outcomes (ePRO)

CTAQ assesses 10 chemotherapy related symptoms:

• nausea
• vomiting
• diarrhoea,
• constipation,
• sore mouth and/or throat
• flu-like symptoms
• Infection
• Pain
• Paraesthesias
• hand-foot syndrome
• fatigue
For patients:

For nurses/clinicians:
Clinicians can view (clinically relevant) data & alert handling
In St James’s Hospital, Dublin

- 64 nurses trained as Alert Handlers
- Week days – Dayward nurses
- Out of hours – Inpatient nurses
Patients’ perceptions and experiences of using a mobile phone-based advanced symptom management system (ASyMS©) to monitor and manage chemotherapy related toxicity

L. McCANN, MSc, BSc Hons, Research Assistant, Cancer Care Research Centre, Department of Nursing and Midwifery, University of Stirling, Stirling, R. MAGUIRE, MSc, BSc, RGN, Research Fellow, Cancer Care Research Centre, Department of Nursing and Midwifery, University of Stirling, Stirling, M. MILLER, MSc, BSc Hons, RGN, Senior Research Fellow, Cancer Care Research Centre, Department of Nursing and Midwifery, University of Stirling, Stirling, & N. KEARNEY, MSc, RGN, Professor of Cancer Care, Cancer Care Research Centre, Department of Nursing and Midwifery, University of Stirling, Stirling, UK

McCANN L., MAGUIRE R., MILLER M. & KEARNEY N. (2009) European Journal of Cancer Care 18, 156–164 Patients’ perceptions and experiences of using a mobile phone-based advanced symptom management system (ASyMS©) to monitor and manage chemotherapy related toxicity

Patients reported many benefits of using ASyMS©

- Improved communication with health professionals
- Improvements in the management of their symptoms
- Feeling reassured their symptoms were being monitored while at home
Remote monitoring systems in the cancer setting

- Growing body of evidence for the clinical benefits of remote monitoring systems in the cancer setting

- Comforting and reassuring for patients to know that their symptoms are being monitored while at home

- Model of care that it likely to be of particular benefit to young patients who have children, work and need to be treated, checked and followed up

- Technology is the future- smart phones, tablets, Apps, Dr Google. Healthcare must adapt to the ehealth era

(Basch 2016, Di Maio et al., 2016)
Acknowledgments:

- Prof Roma Maguire, Strathclyde University
- Dr Lisa McCann, University College Dublin
- Dr Patricia Fox, University College Dublin
- Dr Eileen Furlong, University College Dublin
- Andrew Darley, University College Dublin
- Professor John Kennedy, St James’s Hospital, Dublin
- Nursing team, St James’s Hospital, Dublin
- Professor Giuseppe Gullo, St Vincent’s Hospital, Dublin
- eSMART Consortium Members