MAST - Model for ASsessment of Telemedicine

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1. Background

2. MAST – purposes and basis

3. Assessment process
   • Preceding considerations
   • Multidimensional assessment
   • Transferability

4. Strengths and limitations

5. Applicability of MAST
   • For decision-making
   • For new studies
Background

EU commission:
  – Lack of high quality evidence on the effectiveness of telemedicine: The main barrier for wider use

MethoTelemed project (2009)
  – **Aim**: To provide a structured framework for assessing the effectiveness and contribution to quality of care of telemedicine applications
  – **Model development, based on:**
    • Literature reviews (see Granstrom et al. 2010)
    • Workshops with 30 telemedicine experts to identify users’ and stakeholders’ needs

**MAST:** Model for ASsessment of Telemedicine
Purpose of MAST

- To generate knowledge for evidence-based decision-making, by guiding the assessment of studies on effectiveness of TM implementation.

Definition of proposed assessment:

A multidisciplinary process that summarizes and evaluates information about the medical, social, economic and ethical issues related to the use of telemedicine in a systematic, unbiased, robust manner.
Purpose of MAST

- To generate knowledge for evidence-based decision-making, by guiding the assessment of studies on effectiveness of TM implementation.

Definition of proposed assessment:

A **multidisciplinary** process that summarizes and evaluates information about the medical, social, economic and ethical issues related to the use of telemedicine in a **systematic, unbiased, robust manner**.

Based on scientific methods and studies.
Key references

EUnetHTA, 2008, HTA Core Model for Medical and Surgical Interventions.

Craig et al. 2008. Developing and evaluating complex interventions. (Medical Research Council, UK)


Tran et al. Home telehealth for chronic disease management. CADTH, 2008
MAST – Assessment process

Preceding assessment:
- Aim
- Relevant alternatives?
- International/national/regional/local level?  **Step 1**

Multidisciplinary assessment:
1. Health problem and characteristics of the application
2. Safety
3. Clinical effectiveness
4. Patient perspectives
5. Economic aspects
6. Organisational aspects
7. Socio-cultural, ethical and legal aspects  **Step 2**

Transferability assessment:
- Generalizability
- Scalability
- Cross-border  **Step 3**
**Preceding assessment:**
- Aim
- Relevant alternatives?
- International/national/regional/local level?  **Step 1**

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**Transferability assessment:**
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Step 1: Preceding assessment

1. Determine **the aim** of the TM application → Expected outcomes

2. Select relevant **comparators**

   - Usual care?
   - Improved/ upgraded system?
   - Other technologies?

3. Select most appropriate **assessment level**: National, regional or institutional?

   - Legal issues: Is legislation in place?
   - Reimbursement: Is reimbursement in place?
   - Maturity: Is the application fully developed (steady state)?
   - Number of patients: On how many patients will be able to test it?
Multidisciplinary assessment:
1. Health problem and characteristics of the application
2. Safety
3. Clinical effectiveness
4. Patient perspectives
5. Economic aspects
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7. Socio-cultural, ethical and legal aspects  

Transferability assessment:
• Generalizability
• Scalability
• Cross-border
Step 2: Multidisciplinary assessment

Assessment within each of the 7 domains:

1. Health problem and characteristics of the application
   - Description

2. Safety (adverse effects)
3. Clinical effectiveness
4. Patient perspectives
5. Economic aspects
6. Organisational aspects

7. Socio-cultural, ethical and legal aspects
   - Broader societal issues

Specific outcomes
Outcome selection and methods

1. Outcome measures:
   • Must reflect the aim of the TM intervention
   • Must be based on existing evidence and recommendations in the scientific literature
   • Both, effects on short and long run, must be assessed (If differences expected)

2. Methods - For each domain:
   • Use design producing valid and reliable estimates
   • Produce information at the highest possible level of evidence

3. Data collection:
   – Systematic literature review
   – Design of new studies:
     • RCT, Cluster RCT, controlled studies, ...
     • Interview, surveys, focus group interview (Patients, Clinical staff, Technical experts)
Preceding assessment:

- Aim
- Relevant alternatives?
- International/national/regional/local level?  

Multidisciplinary assessment:

1. Health problem and characteristics of the application
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Transferability assessment:

- Generalizability
- Scalability
- Cross-border
Step 3: Transferability assessment

Asks the question: Can results be generalized to other settings?

Regional? National? International? level

Transferability of the results of each domain:

- Health problem: Based on international standards for data communication?
- Safety: Can results be transferred to other patient groups?
- Clinical: Internal and external validity of results?
- Patient: Differences between subgroups?
- Economy: How does cost vary with number of patients?
- Organization: Barriers and facilitators?
- Socio, legal: Legal conditions?
Strengths

- Based on the comments and suggestions from stakeholders
- Based on scientific studies and criteria for quality
- Multidisciplinary and comprehensive
- Provides list of possible outcomes and discusses the appropriateness of each one
- Based on HTA (EUnetHTA): Familiar to stakeholders in EU, hospitals..

Limitations

- Time consuming
- Does not show why telemedicine works
- Focused on outcomes
- Only relevant in assessment of matured telemedicine application
### Applicability of MAST

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Applicability of MAST

MAST Manual (www.renewinghealth.eu)
• Description of domains, methods for data collection, outcome measures
• Guides for data collection: Economic data, minimum dataset, patient satisfaction...

MAST Open public seminar
• Videos with presentations from MAST teaching seminar (Berlin, May 2010):
• www.mast-model.info

Future publications of results
EC project: Renewing Health

Objective:
- Large scale, real life implementation of TM services
- Design: Pragmatic RCT, complex intervention approach

Budget: 14 mill EURO

Pilots:
- 26 pilots in 9 European regions (I, DK, S, N, ES, GR, D, A, FIN)
- Divided in 9 clusters with common objectives and patients
- Patients: 7,900 patients with COPD, diabetes, CHF
Thank you for listening!

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www.renewinghealth.eu
Maturity – is the application fully developed?

**Initial development**

Assess:
- Safety
- Feasibility

**Steady state**

Assess:
- Effectiveness

Step 1: Preceding assessment
Step 1: Preceding assessment

Number of patients

Cost per patient

Number of patients (\times 100)

(* 100)
Economic aspects (1)

MAST recommends include both EE and business case

Economic evaluation:
- Comparative analysis of alternatives in terms of cost and consequences

Types of economic evaluations:

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<td>Cost-minimisation analysis (CMA)</td>
<td>Incremental cost of A</td>
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<td>Cost-effectiveness analysis (CEA)</td>
<td>Incremental cost of A per extra unit of outcome</td>
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<tr>
<td>Cost-utility analysis (CUA)</td>
<td>Incremental cost of A per extra QALY</td>
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<tr>
<td>Cost-benefit analysis (CBA)</td>
<td>Cost-benefit ratio of A?</td>
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Economic aspects (2)

Business case:

Aim: Estimate Return on Investment for the institution using telemedicine

\[
\frac{\text{Increase in revenue (money gain)}}{\text{Expenditures (money invested)}}
\]

Part 1: Expenditures:
E.g. increase in the hospitals total expenditures of treating the patient group

Part 2: Changes in revenue
For public financed hospitals: Changes in reimbursement
Patient perspectives (1)

1. **Perceptions and satisfaction** of: patients (BUT also: relatives, caregivers)

2. **Key aspects** are:
   - Satisfaction or acceptance
   - Understanding of information
   - Confidence
   - Ease of use
   - Access
   - Empowerment and self-efficacy

3. Not easy to define, as includes **many aspects** such as:
   - Feelings, comfort
   - Interaction with professionals
   - Convenience, timeliness
   - Overall satisfaction
   - Preference as compared with face to face interaction
   - Privacy and confidentiality
   - Professionals’ competence and/or personal manner
   - Views about the technology itself
   - Informativeness of professionals
   - Usefulness/potential for future use
   - Self efficacy and empowerment

**Selection:**
An evaluation has to be adapted to the concrete intervention and specify which aspects are important
Patient perspectives (2)

Data collection:

1. Qualitative methods
   - Interviews (semi structured)
   - Diary keeping
   - Patients record and self report their symptoms

2. Quantitative methods
   - Questionnaires to patients
   - Standard satisfaction survey (e.g. Group Health Association of America Consumer Satisfaction Survey)
   - Standard QoL measures (e.g. SF36 – a generic health and well-being scale)
   - Condition related standard measures (e.g. DQOL [Diabetes], DemQOL [Dementia] and others)

3. Mixed methods
   - Selection of qualitative and quantitative tools
Important decision: should the new technology be adapted to the organisation, or should the organisation be adapted to the technology?

**Impact on:**
1. Process (workflow, participating staff, training and resources)
2. Structure and management
3. Culture (staff attitudes towards TM, etc)

**Methods for data collection:**
- systematic literature review
- interviews (single or focus groups)
- questionnaires
- observation
- surveys
- statistical studies