How to assess the value of innovative medical technologies?

- Experiences with MAST from P@H

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Kidholm et al. (2012)
Model for Assessment of Telemedicine

MAST – Model for Assessment of Telemedicine

STEP 1:

Preceding assessment:

- Is the technology and the organization matured?

STEP 2:

Multidisciplinary assessment (domains):

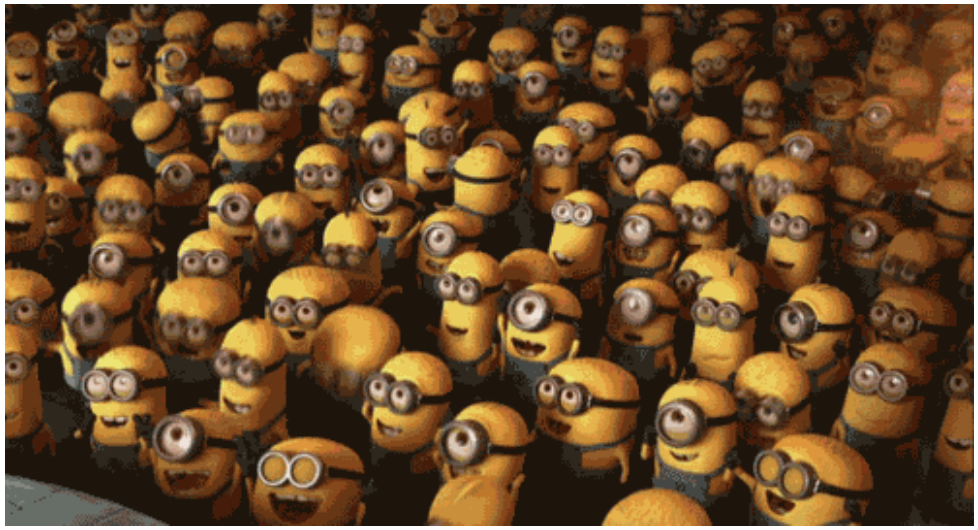
1. Health problem and characteristics of the application
2. Safety
3. Clinical effectiveness
4. Patient perspectives
5. Economic aspects
6. Organisational aspects
7. Socio-cultural, ethical and legal aspects

STEP 3:

Transferability assessment

What has been our experiences?

1. Several usable methods in the preceding assessment!
2. Be aware of the costs of the intervention!
3. Be aware of pro and cons of your design when assessing effects!
4. MAST is usable and has face validity!



1. Usable methods in the preceding assessment!

Involvement of patients and professions is needed to ensure maturity

Methods:

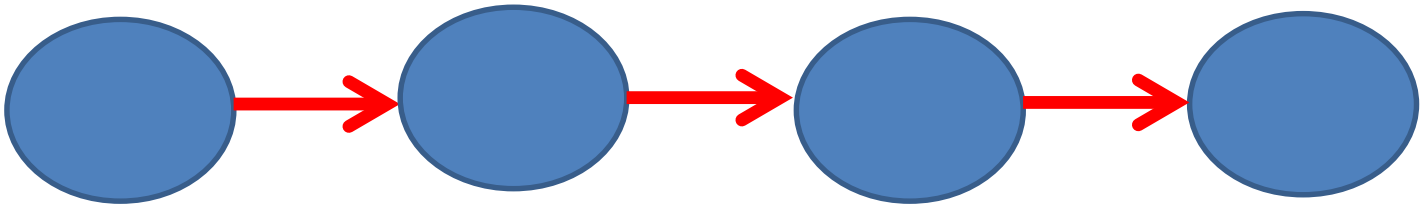
Clemensen et al. (2017)
Participatory design methods in telemedicine research.

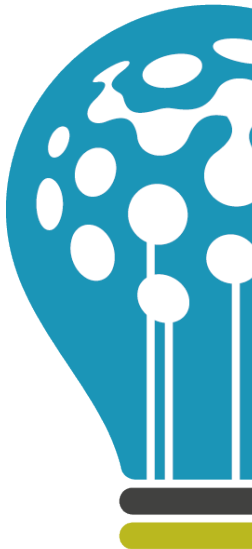
1. **Participatory design - participation of users in the design process**
   - Patient interviews, observation studies, fokus groups interviews…..

2. **Optimization studies – isolate effective elements in complex interventions**
   - Questionnaire or interview studies

Schmidt et al. (2017)
ACQUIRE-HF feasibility study

3. **Pilot studies – test of the study procedures**



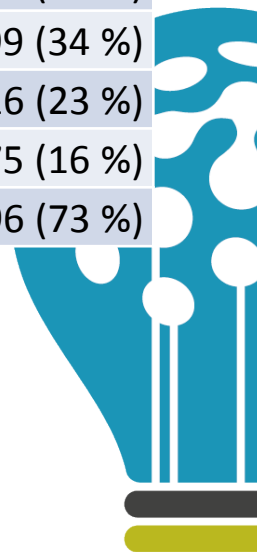


Kidholm, Kristensen (2017)
Review of economic evaluations

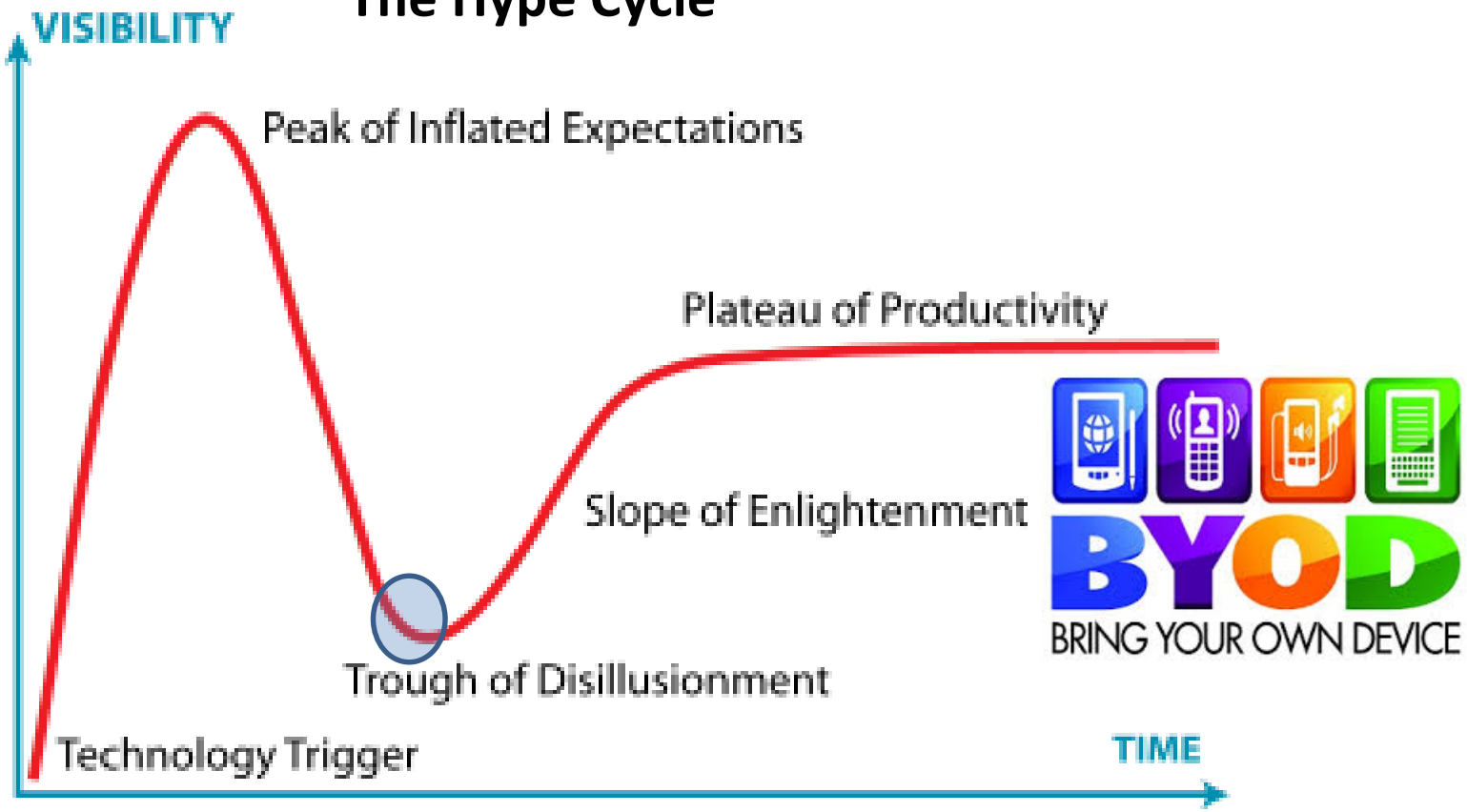
Fasterholdt et al. 2016)
Cost-effectiveness of telemonitoring

2. Be aware of the costs of the intervention!

First author	Mean cost per telemedicine patient, €	Mean cost per control patient, €	Difference	Home monitoring programme costs per patient	Home monitoring equipment costs
De San Miguel	12,706	15,471	-2,765	3,323	1,277 (38 %)
Jódar-Sánchez	2,304	1,105	1,199	237	104 (44 %)
Stoddart	14,486	11,768	2,718	570	365 (64 %)
Udsen	8,793	7,251	1,542	705	335 (48 %)
Henderson*	8,037	7,015	1,042	1,852	848 (46 %)
Fasterholdt	12,641	14,724	-2,086	586	199 (34 %)
Stoddart*	363	225	*138	71	16 (23 %)
Cui	5,062	5,735	-681	1,686	275 (16 %)
Ryan *	441	344	*98	131	96 (73 %)



The Hype Cycle



3. Be aware of pro and cons of your design!

Cohort study

Patients after implementation

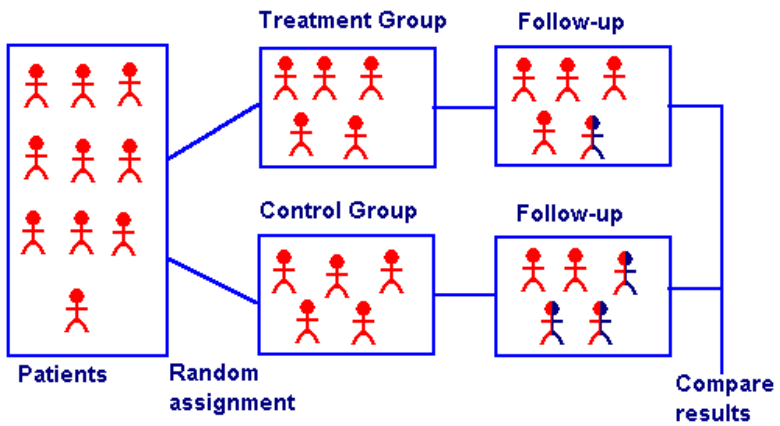
Observational study

Patients before implementation

Patients after implementation

TIME

Randomised controlled trial



Kidholm, Kristensen (2017)
Review of economic evaluations

3. Be aware of pro and cons of your design!

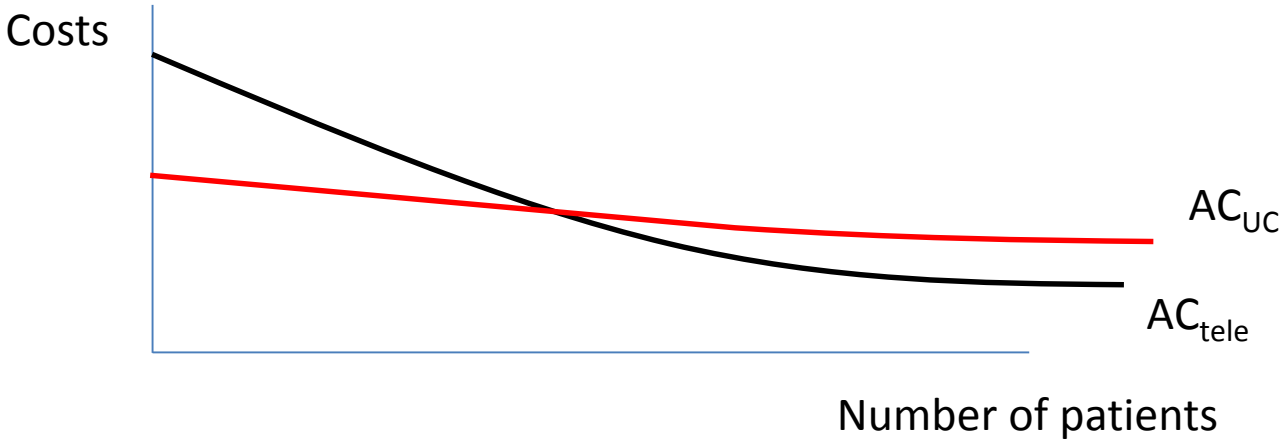
Special features of eHealth interventions:

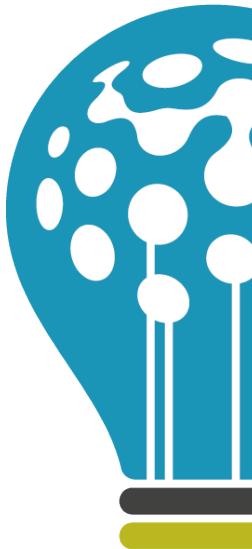
1. Learning curve

If adoption, user education, experience is expected to change over time.
Methods: Long term studies, modelling, observational studies

2. Organisational change

If substantial reorganisation of healthcare is needed.
Methods: Identify need for change, cluster Randomisation





Kidholm et al. (2017)
Review of studies using MAST

Kidholm et al. (2016)
Delphi study of the validity of MAST

4. MAST is usable and has face validity!

Published studies using MAST: 21
Publications refering to MAST: 158

- Delphi process, March 2016
- 19 European health care managers

Result:

- +80% consider the seven domains moderately or highly important

Rojahn et (2016):

- Clinical criteria:
  - Clinical effectiveness
  - Safety
  - Patient compliance
- Health economic criteria
- Evidence on patient satisfaction

Table 2. Response to questions about importance of domains and topics in the Delphi process.

	Results from first round			Results from second round		
Domains and topics	Median	Range	Proportion answering 'moderately important' or 'highly important'	Median	Range	Proportion answering 'moderately important' or 'highly important'
Domain 1: Health problem and description of the application	3	2–3	100%	3	2–3	100%
Health problem of the patients	3	1–3	95%	3	2–3	100%
Description of the application	3	1–3	95%	3	2–3	100%
Technical characteristics	3	0–3	84%	2	1–3	89%
Domain 2: Safety	3	2–3	100%	3	2–3	100%
Clinical safety	3	3–3	100%	3	3–3	100%
Technical safety	3	2–3	100%	3	2–3	100%
Domain 3: Clinical effectiveness	3	1–3	95%	3	2–3	100%
Effects on morbidity	3	2–3	100%	3	2–3	100%
Effects on mortality	3	2–3	100%	3	2–3	100%
Effects on quality of life	2	1–3	68%	2	1–3	84%
Behavioural outcomes	2	1–3	84%	2	1–3	95%
Use of health service	3	2–3	100%	3	2–3	100%
Domain 4: Patient perspectives	3	2–3	100%	3	2–3	100%
Patient satisfaction	3	1–3	95%	3	2–3	100%
Patients understanding of information	3	1–3	89%	3	2–3	100%
Patient acceptance	3	1–3	95%	3	2–3	100%
Patients confidence in the telemedicine treatment	2	1–3	84%	2	2–3	100%
Patients ability to use the application	3	2–3	100%	3	2–3	100%
Patients access and accessibility	2	1–3	95%	3	2–3	100%
Patients empowerment and self-efficacy	2	1–3	84%	2	2–3	100%
Domain 5: Economic aspects	3	2–3	100%	3	2–3	100%
Societal economic evaluation	2	0–3	95%	2	2–3	100%
Business case	2	1–3	84%	2	1–3	95%
Domain 6: Organisational aspects	2	2–3	100%	3	2–3	100%
Consequences for the process	2	2–3	100%	3	2–3	100%
Consequences for the structure	2	1–3	84%	2	2–3	100%
Consequences for the culture	2	1–3	89%	2	2–3	100%
Consequences for the management	2	0–3	79%	2	1–3	95%
Domain 7: Socio-cultural, ethics, legal aspects	2	0–3	89%	3	2–3	100%
Ethical issues	2	0–3	84%	2	2–3	100%
Legal issues	3	0–3	84%	3	0–3	95%
Social issues	2	0–3	79%	2	1–3	95%
Transferability of the described results to your local setting	3	1–3	95%	3	2–3	100%
Transferability of safety	3	1–3	95%	3	2–3	100%
Transferability of clinical effectiveness	3	2–3	100%	3	2–3	100%
Transferability of patient perspectives	2	2–3	100%	3	2–3	100%
Transferability of economic aspects	3	0–3	89%	2	1–3	95%
Transferability of organisational aspects	2	2–3	100%	3	2–3	100%
Transferability of socio-cultural, ethical, legal aspects	2	0–3	89%	2	2–3	100%

Conclusion

1. Assessment of value of medical innovative technologies is needed

2. MAST is used as a framework for assessment in P@H

3. Widely used - 158 publications refer to MAST (google scholar)

4. Experiences:
    - PD, optimization studies, pilots are useable to ensure maturity
    - Be aware of high costs of the intervention
    - Use the right design
    - Face validity of MAST has been demonstrated

Questions?