CMGF 18E CONGRÈS MÉDECINE GÉNÉRALE FRANCE
Organisé par CMG collège de la médecine générale

Digital technology in Family medicine/ General Practice Quality and Safety perspectives

Ass Clin Prof Andree Rochfort, GP

Irish College of GPs, Dublin, Ireland

Prof Dorien Zwart, GP.

University Medical Center Utrecht, University Utrecht, The Netherlands

On behalf of EQuiP Network, WONCA Europe

https://www.qualityfamilymedicine.eu/

Andrée Rochfort, Academic GP Ireland

Irish College of GPs, Dublin, Director of Quality Improvement

- *Doctor Health & Wellbeing, Medical Education and Supports*
- *Sustainable Healthcare & Planetary Health, Glas Toolkit*

University College Dublin, Assistant Prof.

President EQuiP, Q&S Network in WONCA Europe

UCD School of Medicine
Scoil an Leighis UCD

Dorien Zwart, Academic GP in Utrecht, The Netherlands
President Elect, EQuiP, Q&S Network, WONCA Europe

UMC Utrecht

As a GP Researcher: focus on Quality & Safety of GP care

Universiteit Utrecht

Wonca
World family doctors. Caring for people.
EUROPE

EQuiP
European Association for Quality and Safety in General Practice/Family Medicine

World Organisation of National Colleges and Academic associations of GP/FamMed

European Quality & Safety Network

www.qualityfamilymedicine.eu

equip@qualityfamilymedicine.eu

We both have no conflict of interest to declare for this presentation

The Quality & Safety Perspective

Mentimeter survey

menti.com

CODE 8792 9969

https://www.mentimeter.com/app/presentation/al45wrjffu1ptivxejm4evx7uxpebopt/edit?question=himj4areqph9

Agenda

- **Defining ‘digital technologies in FM/GP care’**
- **Tools & Technologies**
- **Participants discussions**
- **Evidence and experiments**
- **Wrap up**

‘Digitalisation’

Changes taking place in society and the economy as a result of the increasing influence of information and communication technology (‘ICT’) (VHIC, 15/02/2007)

Nederlands Huisartsen Genootschap

Digitalisation

Changes taking place in society and the economy as a result of the increasing influence of information and communication technology (‘ICT’)

E-health

The application of both digital information and communication to support and/or improve health and healthcare

(NICTIZ, 2019)

Nederlands Huisartsen Genootschap

Digitalisation

Changes taking place in society and the economy as a result of the increasing influence of information and communication technology (‘ICT’)

E-health

The application of both digital information and communication to support and/or improve health and healthcare

Digital healthcare

E-health as an integral part of healthcare

Nederlands Huisartsen Genootschap

Digitalisation

Changes taking place in society and the economy as a result of the increasing influence of information and communication technology (‘ICT’)

E-health

The application of both digital information and communication to support and/or improve health and healthcare

Digital healthcare

E-health as an integral part of healthcare

In accordance with the professional standards

Wkkgz
wet BIG
GDPR
WGBO
MDR
ZVW
Science, guideline, conduct, experience

Nederlands Huisartsen Genootschap

Digitalisation

Changes taking place in society and the economy as a result of the increasing influence of information and communication technology (‘ICT’)

E-health

The application of both digital information and communication to support and/or improve health and healthcare

Digital healthcare

E-health as an integral part of healthcare

Digital FM/GP care

Digital care as part of the primary process of FM/GP care

nhg Nederlands Huisartsen Genootschap

Digitalisation

Changes taking place in society and the economy as a result of the increasing influence of information and communication technology ('ICT')

E-health

The application of both digital information and communication to support and/or improve health and healthcare

Digital healthcare

E-health as an integral part of healthcare

Digital FM/GP care

Digital care as part of the primary process of FM/GP care

Supported by appropriate ICT infrastructure

nhg Nederlands Huisartsen Genootschap

Digital care by the GP

EXAMPLES OF TOOLS

GPinfo.nl

Information on disease and health

Preparing healthcare consultation

Online access in electronic patient record

Access to healthcare

Digital triage
Triage decision support

Triage

Diagnostic decision support

Diagnostics

Anamnese

Examination

Medical Evaluation

Management

Telemonitoring

Patient education

Treatment

Follow up

Digitale consultation

Consultation & referral

Evaluation of the care process

Based on the format of NHG-guidelines and the primary process of FM/GP care

Digital Tools & Technologies

Digital Tools & Technologies

Q Help or Hindrance?

Digital care by the GP

EXAMPLES OF TOOLS

GPinfo.nl

Information on disease and health

Preparing healthcare consultation

Online access in electronic patient record

Access to healthcare

Digital triage
Triage decision support

Triage

Diagnostic decision support

Diagnostics

Anamnese

Examination

Medical Evaluation

Management

Telemonitoring

Patient education

Treatment

Follow up

Digitale consultation

Consultation & referral

Evaluation of the care process

Based on the format of NHG-guidelines and the primary process of FM/GP care

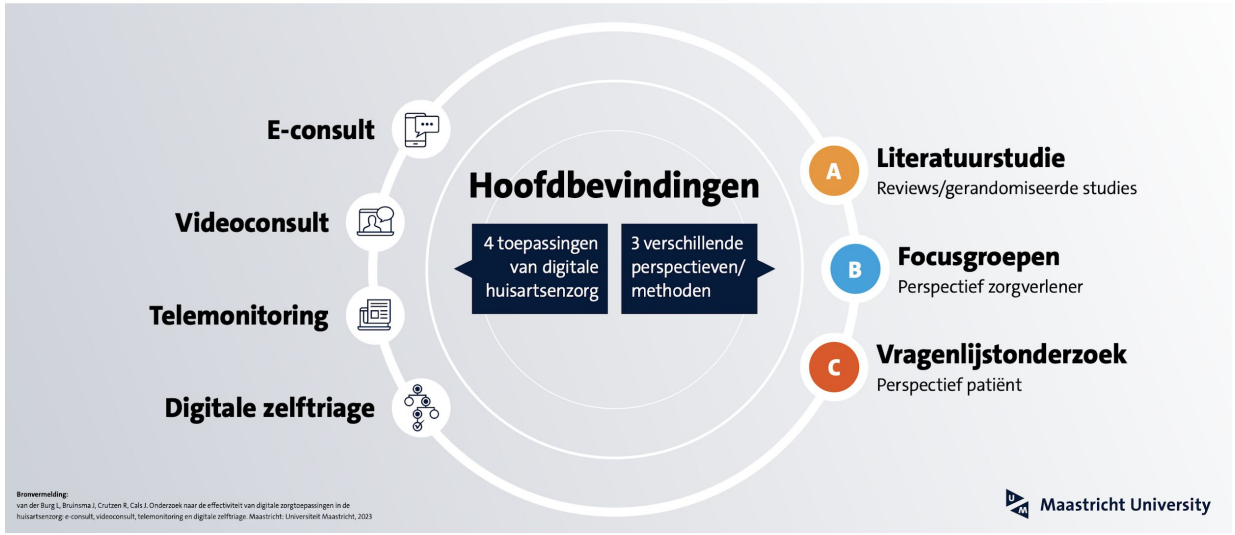

EVIDENCE
EVIDENCE
EVIDENCE
EVIDENCE

E-Consult, Video consultation, Telemonitoring

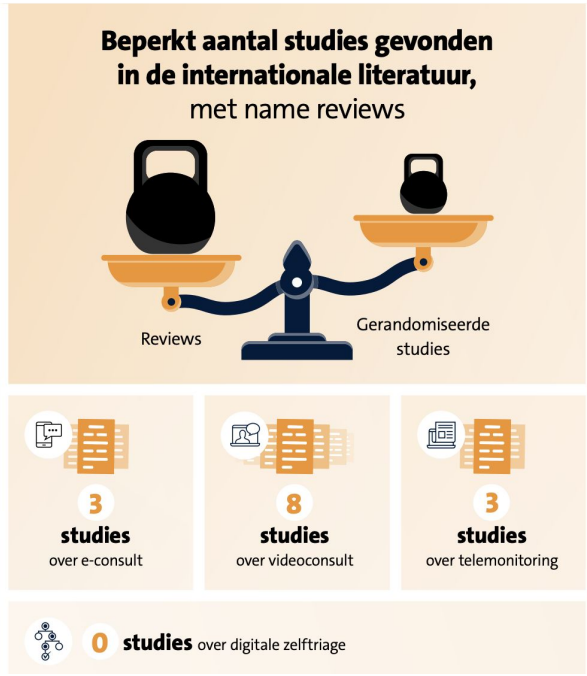
Literature review 2023 of GP-colleagues, Maastricht University

INFOGRAPHIC

DIGITALE ZORGTOEPASSINGEN IN DE HUISARTSENZORG



A **Literatuurstudie**
Reviews/gerandomiseerde studies



E-consult

- ✓ Leercurve mogelijk bij zowel patiënt als zorgverlener
- ✓ Toename gebruiksgemak en toegankelijkheid voor patiënt
- ✗ Gebrek aan bewijs over (kosten)effectiviteit en effect op werkdruk
- ✗ Zorgen bij zorgverleners over juist gebruik door patiënt

Videoconsult

- ✓ Tevredenheid bij patiënt en zorgverlener
- ✓ Tijdsbesparing voor patiënt (minder reistijd)
- ✗ Zorgen over privacy/veiligheid bij patiënt
- ✗ Ongeschikt voor complexere hulpvragen

Telemonitoring

- ✓ Mogelijk verbetering van glucosewaarden op korte termijn, mogelijk ook op (middel)lange termijn, ten opzichte van reguliere zorg
- ✗ Geen verbetering van bloeddrukwaarden op korte en middellange termijn ten opzichte van reguliere zorg

Digital Triage

Review 2024 by GP researchers UMC Utrecht:

Scoping; Grey literature: 32
Systematic; Scientific literature: 10

Results:

- Level of evidence low
- Accuracy & efficiency varied widely
- Satisfaction among users high

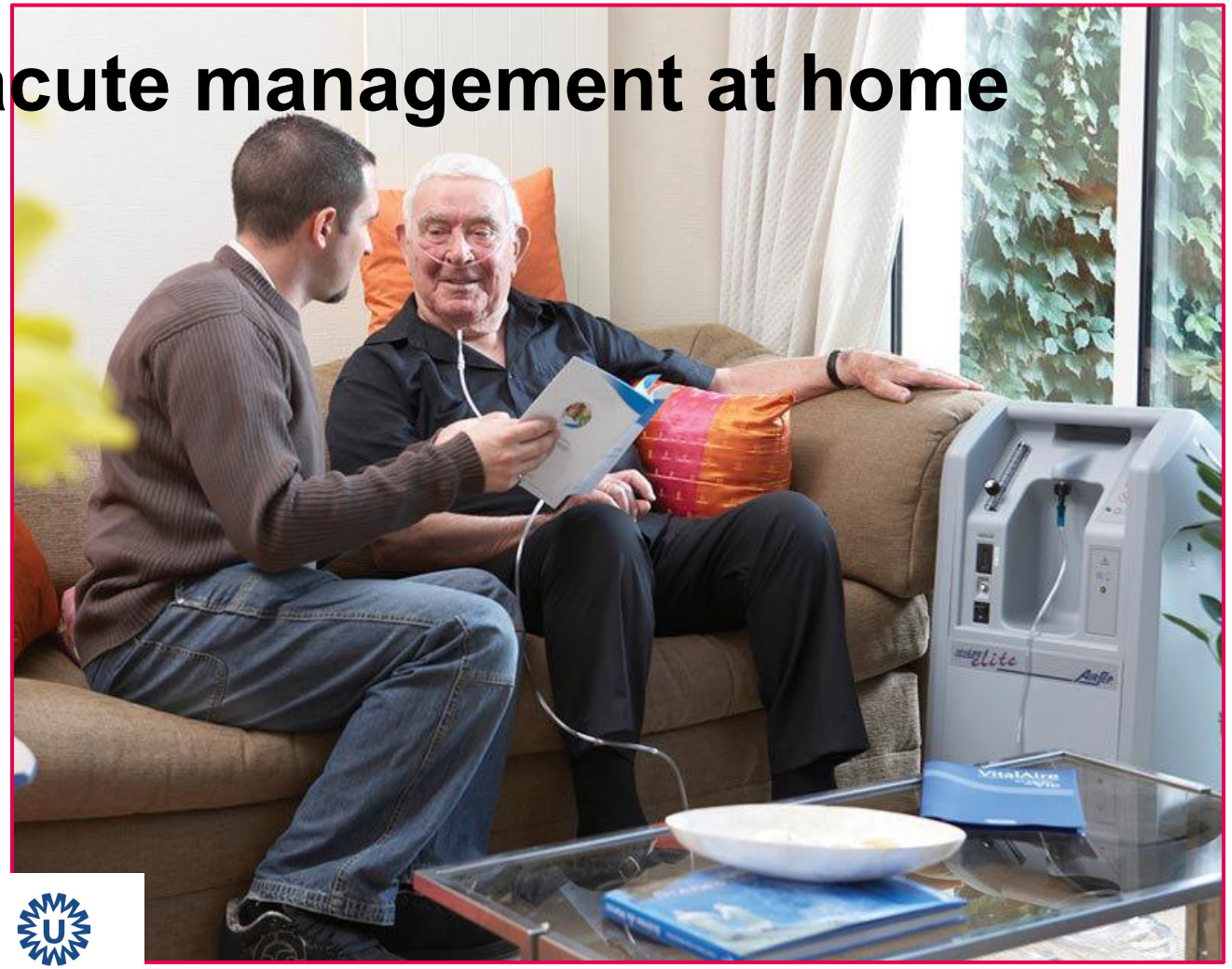
Remote monitoring plus acute management at home

SAT@HOME COVID-19

THERAPY@HOME COVID-19

HOME-ART Clinical Trial

OmU@Home

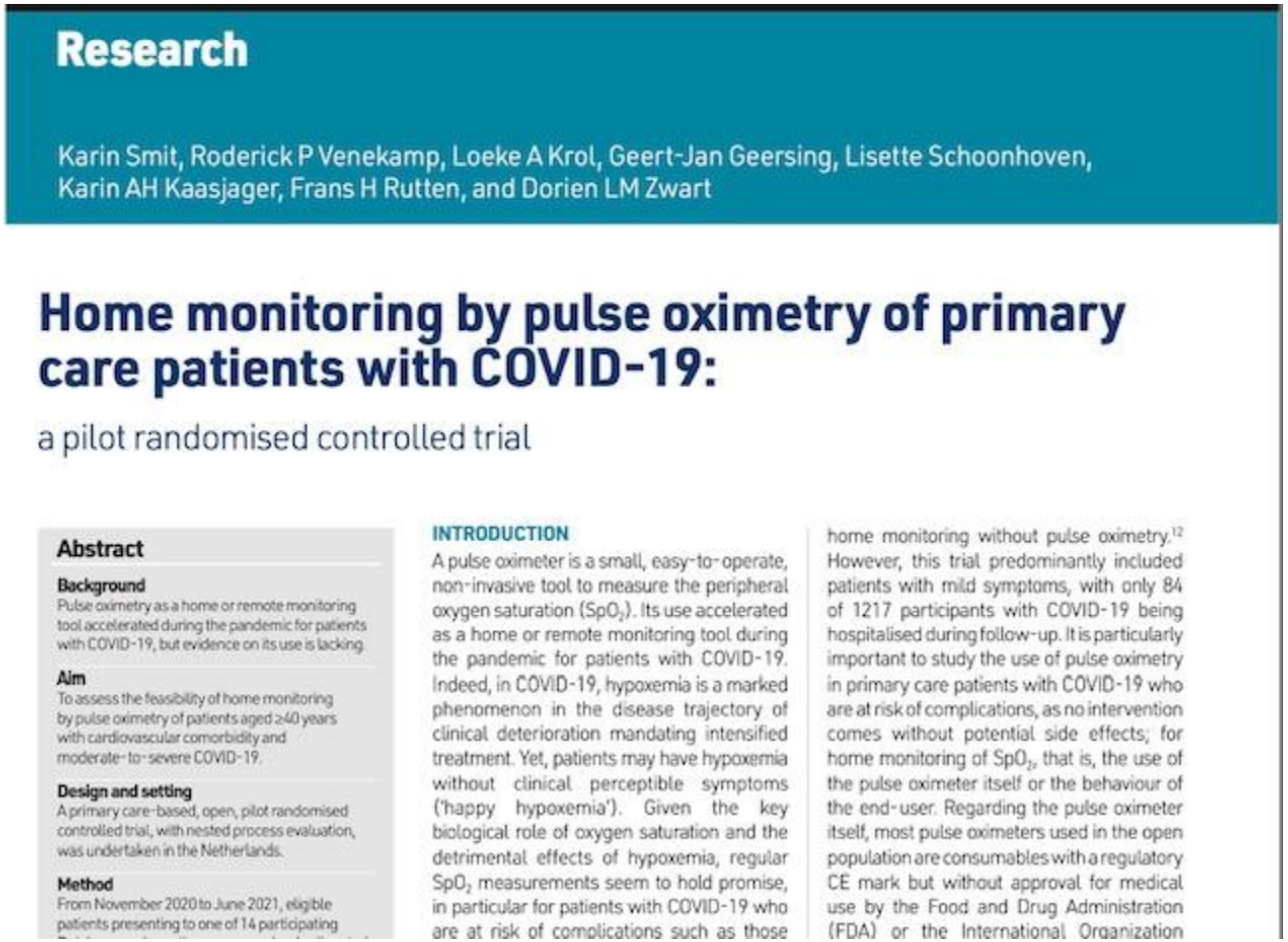


UMC Utrecht

SAT@HOME
COVID-19

RCT- feasibility study for monitoring acutely ill patients in GP practice with pulse oximeter

- Adherence high
- PROM feeling safety high
- No extra GP consultations



Research

Karin Smit, Roderick P Venekamp, Loeke A Krol, Geert-Jan Geersing, Lisette Schoonhoven, Karin AH Kaasjager, Frans H Rutten, and Dorien LM Zwart

Home monitoring by pulse oximetry of primary care patients with COVID-19:

a pilot randomised controlled trial

Abstract

Background
Pulse oximetry as a home or remote monitoring tool accelerated during the pandemic for patients with COVID-19, but evidence on its use is lacking.

Aim
To assess the feasibility of home monitoring by pulse oximetry of patients aged ≥40 years with cardiovascular comorbidity and moderate-to-severe COVID-19.

Design and setting
A primary care-based, open, pilot randomised controlled trial, with nested process evaluation, was undertaken in the Netherlands.

Method
From November 2020 to June 2021, eligible patients presenting to one of 14 participating

INTRODUCTION

A pulse oximeter is a small, easy-to-operate, non-invasive tool to measure the peripheral oxygen saturation (SpO_2). Its use accelerated as a home or remote monitoring tool during the pandemic for patients with COVID-19. Indeed, in COVID-19, hypoxemia is a marked phenomenon in the disease trajectory of clinical deterioration mandating intensified treatment. Yet, patients may have hypoxemia without clinical perceptible symptoms ('happy hypoxemia'). Given the key biological role of oxygen saturation and the detrimental effects of hypoxemia, regular SpO_2 measurements seem to hold promise, in particular for patients with COVID-19 who are at risk of complications such as those

home monitoring without pulse oximetry.[12] However, this trial predominantly included patients with mild symptoms, with only 84 of 1217 participants with COVID-19 being hospitalised during follow-up. It is particularly important to study the use of pulse oximetry in primary care patients with COVID-19 who are at risk of complications, as no intervention comes without potential side effects; for home monitoring of SpO_2, that is, the use of the pulse oximeter itself or the behaviour of the end-user. Regarding the pulse oximeter itself, most pulse oximeters used in the open population are consumables with a regulatory CE mark but without approval for medical use by the Food and Drug Administration (FDA) or the International Organization

UMC Utrecht

THERAPY@HOME
COVID-19

- ‘Acute disease management’ at home
- Collaborative network care
- Including remote monitoring
- Involving of informal carers

- Intervention development pilot in t

UMC Utrecht

Open access Protocol

BMJ Open **Home-based management of hypoxaemic COVID-19 patients: design of the Therapy@Home pilot study**

Josi A Boeijen ,[1] Alma C van de Pol,[1] Rick T van Uum ,[1] Roderick P Venekamp ,[1] Karin Smit,[1] Karin A H Kaasjager,[2] Robert van den Broek,[3] Wilma Bijsterbosch,[3] Lisette Schoonhoven,[1] Frans H Rutten ,[1] Dorien L M Zwart[1]

To cite: Boeijen JA, van de Pol AC, van Uum RT, *et al*. Home-based management of hypoxaemic COVID-19 patients: design of the Therapy@Home pilot study. *BMJ Open* 2024;**14**:e079778. doi:10.1136/bmjopen-2023-079778

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (http://dx.doi.org/10.1136/bmjopen-2023-079778).

Received 11 September 2023
Accepted 07 January 2024

ABSTRACT

Introduction During the COVID-19 pandemic, hospital capacity was strained. Home-based care could relieve the hospital care system and improve patient well-being if safely organised.

We designed an intervention embedded in a regional collaborative healthcare network for the home-based management of acutely ill COVID-19 patients requiring oxygen treatment. Here, we describe the design and pilot protocol for the evaluation of the feasibility of this complex intervention.

Methods and analysis Following a participatory action research approach, the intervention was designed in four consecutive steps: (1) literature review and establishment of an expert panel; (2) concept design of essential intervention building blocks (acute medical care, acute nursing care, remote monitoring, equipment and technology, organisation and logistics); (3) safety assessments (prospective risk analysis and a simulation patient evaluation) and (4) description of the design of the

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ We describe five essential elements ('building blocks') that comprise complex interventions for home-based management of acutely ill COVID-19 patients.
⇒ These generic building blocks could also be applied to the development of home-based management for other acutely ill patients.
⇒ The design of the intervention was iteratively developed and extensively evaluated by a multidisciplinary expert panel.
⇒ Informed consent will be asked from acutely ill patients, which may lead to a high participation barrier.
⇒ The current study will give important information on the feasibility of the intervention implementation, but it will not yield data on the formal efficacy of the intervention.

THERAPY@HOME
COVID-19

Collaborative acute care at home for hypoxemic COVID-19 patients:

- **O2 and medication at home**
- **After elective diagnostic work up at ED**
- **instead of hospital admission home**

- **5 building blocks**


Medical care


Oxygen/equipment


Remote monitoring


Acute nursing care


Organisation and Logistics

THERAPY@HOME
COVID-19

THERAPY@HOME
COVID-19

THERAPY@HOME
COVID-19

Boeijen *et al. BMC Health Services Research* (2023) 23:1257
https://doi.org/10.1186/s12913-023-10191-6

BMC Health Services Research

RESEARCH Open Access

Home-based initiatives for acute management of COVID-19 patients needing oxygen: differences across The Netherlands

Josi A. Boeijen[1*], Alma C. van de Pol[1], Rick T. van Uum[1], Karin Smit[1], Abeer Ahmad[1,2], Eric van Rijswijk[3], Marjan J. van Apeldoorn[4], Eric van Thiel[5], Netty de Graaf[5], R. Michiel Menkveld[6], Martijn R. Mantingh[7], Silke Geertman[1], Nicolette Couzijn[1], Leon van Groenendael[8], Henk Schers[8], Jettie Bont[2], Tobias N. Bonten[9], Frans H. Rutten[1] and Dorien L. M. Zwart[1]

Abstract

Objective During the COVID-19 pandemic new collaborative-care initiatives were developed for treating and monitoring COVID-19 patients with oxygen at home. Aim was to provide a structured overview focused on differences and similarities of initiatives of acute home-based management in the Netherlands.

Methods Initiatives were eligible for evaluation if (i) COVID-19 patients received oxygen treatment at home; (ii) patients received structured remote monitoring; (iii) it was not an 'early hospital discharge' program; (iv) at least one patient was included. Protocols were screened, and additional information was obtained from involved physicians. Design choices were categorised into: eligible patient group, organization medical care, remote monitoring, nursing care, and devices used.

Results Nine initiatives were screened for eligibility; five were included. Three initiatives included low-risk patients and two were designed specifically for frail patients. Emergency department (ED) visit for an initial diagnostic work-

Overview of design choices

Vulnerable patients	Yes	No	No
ED evaluation	Only if >3L O2	Yes	Yes
GP responsible	Yes	Yes	No
Maximum O2	3L	4L	3L
Remote monitoring	Pulse oximetry + app	Pulse oximetry + app	Pulse oximetry + app
Frequency reporting vitals	3	3	4
Home visits	GP	GP	Nurse (1x)

Inclusion of patients

Potentially eligible	**123**	**13**	**44**	**66**
Informed consent	**82 (67%)**	**10 (78%)**	**27 (61%)**	**45 (68%)**
GP files available	**62 (50%)**	**9 (69%)**	**24 (55%)**	**29 (44%)**

Patient characteristics - demographics

Man	47 (57%)	7 (70%)	13 (48%)	27 (60%)
Age (years)	62	66	64	60
BMI (mean)*	29	28	28	29
Actual smoker	4 (6%)	1 (14%)	1 (5%)	2 (5%)
Former smoker	20 (29%)	4 (57%)	7 (32%)	9 (23%)
Any comorbidity	37 (46%)	8 (89%)	14 (52%)	15 (33%)
Any medication	52 (64%)	7 (78%)	18 (67%)	27 (60%)

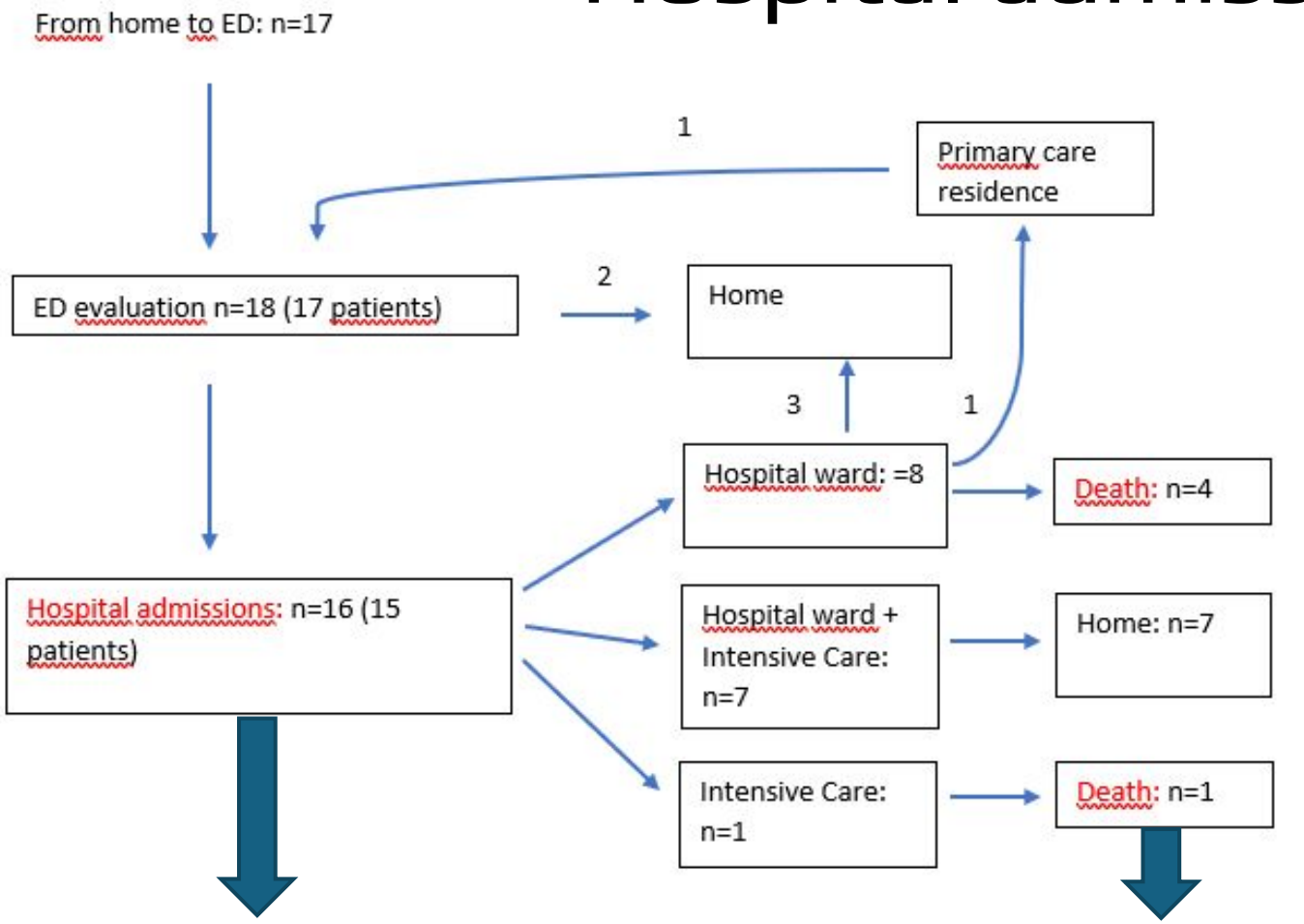
Patient characteristics – at inclusions / care duration

Prior illness (days)	10	6	9	10
Lowest SaO2 at start*	91%	87%	90%	92%
Days monitoring	16	16	15	16
Days O2	11	10	13	10

Workload GP: GP contacts

Patient with contact	40 (65%)	7 (78%)	21 (88%)	12 (41%)
Total contacts	128	33	74	21
Contacts per patients	3.2	4.7	3.5	1.8

Hospital admissions/mortalit



15/82 patients: 18% admission

5/82 patients: 6% mortality

Acute home management programmes for COVID-19 in ‘ care as usual’ context

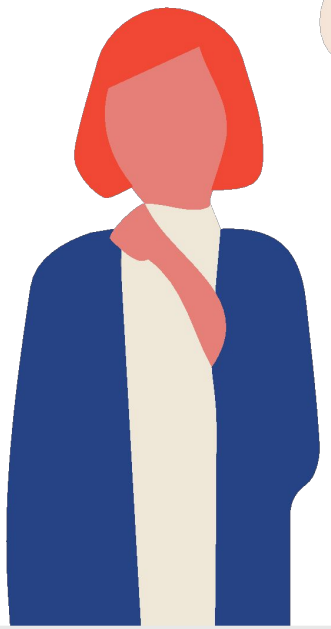
- 3 initiatives managed 123 patients at home with O2
- 1 programme for vulnerable patients; in 2 the GP was responsible
- All used pulse oximetry + app for remote monitoring

Clinical outcomes of patients

- Mean O2 duration at home 11 days
- Workload for GP was substantial, also when specialist was responsible
- 82% were fully managed at home instead of in-hospital

>> HOME-ART Clinical Trial ome-based management of patients with hypoxemia due to respiratory tract infections

Studies on ‘User perspectives’



Technician & researcher

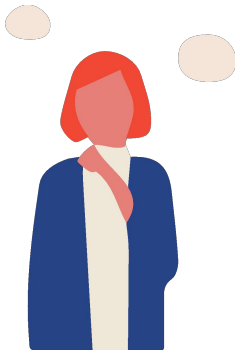
Patient and caregiver

Physician GP

Technician's/researcher's perspective:

Very eager to innovate and implement, yet worries on

1. Validation of technology for clinical practice
2. False alerts & unexpected technical issues



Patient's and caregiver's perspective:
in hindsight all very satisfied to have been treated at home,
but initial concerns on

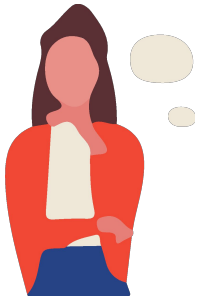
1. Is my home suitable?
2. Can I handle the technical devices?
3. What if I have questions?
4. Concerns for the informal carer





Physician's perspectives:

1. What is best for the patient in front of me?
2. Can I do my job well enough?
3. Making the healthcare system fit for the future



Take Home

- Bringing tools & technologies to patients' homes has great potential for quality of care
- Implementation in real world practice brings challenges

  The devil is in the details

  "The key to discovering latent need is observation"

- Capturing the promises of tools & technologies in *real world healthcare* needs co-creation, experimental and careful evaluation!

Thank you for participating....

EQuiP Website

www.qualityfamilymedicine.eu

EQuiP email

equip@qualityfamilymedicine.eu