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	Révision :	
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STATISTICAL ANALYSIS PLAN

Protocol title: Efficacy of an Active Geriatric Evaluation for geriatric syndromes (AGE tool) to prevent functional decline in elderly patients in family medicine: a pragmatic cluster randomized trial

Protocol number : ClinicalTrials.gov NCT02618291 ; CER-VD 2016-00422

Protocol version and date : Version 9, 19/12/2018

SAP author : Yolanda Müller Chabloz

SAP version : v2, 09.07.2020


SAP Revision : -

SAP implementation : Yolanda Müller Chabloz, Isabella Locatelli

Reference person : Yolanda Müller Chabloz

CONFIDENTIEL

Le plan d'analyses statistiques doit être préparé par le chercheur et le statisticien, afin de décider de la meilleure approche pour répondre aux objectifs de l'étude. Ainsi, le SAP doit être rédigé par le(s) chercheur(s) et par le statisticien : le statisticien responsable doit écrire le SAP, ou le passer en revue si l'investigateur fournit un SAP complet. Les auteurs du SAP sont responsables de s'assurer que le SAP soit produit en suivant les spécifications correctes de l'étude et de le faire parvenir pour révision à l'investigateur

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Version 1, 29.11.2018

Approbation :

Approved by :

Name : . Dr Yolanda Müller Chabloz *Date*
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Principal investigator



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ABBREVIATIONS

ADL	Activities of Daily Living
AE	Adverse Event
AGE	Active Geriatric Evaluation
BAT	Brief Assessment Tool
CER VD	Commission d'Ethique de la Recherche sur l'être humain du canton de Vaud
CRC	Centre de Recherche Clinique
CRF	Case Report Form
eCRF	Electronic Case Report Form
CTCAE	Common terminology criteria for adverse events
FP	Family Practitioner
GCP	Good Clinical Practice
Ho	Null hypothesis
H1	Alternative hypothesis
IADL	Instrumental activities of daily living
IQR	Interquartile range
ITT	Intention to treat
PIM	Potentially Inappropriate Prescription
SAE	Severe Adverse Event
SAP	Statistical Analysis Plan
SOP	Standard Operating Procedure
WHOQOL-OLD	WHO quality of life score for the elderly

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1. STUDY OBJECTIVES

1.1. Overall Objective

The aim of the project is to determine whether an active geriatric evaluation performed in family medicine, combining a brief assessment tool (BAT) for the early diagnosis of geriatric syndromes with a structured diagnostic and management strategy (AGE tool), impacts on the functional decline and quality of life of elderly patients.

1.2. Primary Objective

The primary objective of this project are to determine whether the AGE tool used in family medicine:

1. reduces the functional decline of elderly patients.


1.3. Secondary Objectives

The secondary objectives of this project are to determine if the AGE tool used in family medicine:

2. improves the quality of life of elderly patients.
3. reduces the incidence of hospital admissions
4. reduces the incidence of institutionalizations
5. reduces the incidence of emergency visits
6. impacts on the number of FP outpatient visits
7. improves the processes of care (diagnoses and management) of elderly patients
8. is acceptable and feasible for patients and family practitioners

1.4. Safety Objectives

The **safety objective** of this project is to determine if the AGE tool administered in family medicine impacts the quality of life, hospitalization and death rate of elderly patients.

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2. RESEARCH QUESTIONS AND HYPOTHESES

2.1. Efficacy :

1. The AGE tool used in family medicine reduces the functional decline of elderly patients.

Hypothesis 1.1:

The null hypothesis is that there is no difference in the proportion of patients having lost at least one IADL after 2 years of follow-up after 2 years of follow-up, between elderly patients followed by a family practitioner using the AGE assessment and management tool and elderly patients followed in usual care.

The alternative hypothesis is that there will be a difference of at least 15% in the proportion of patients having lost at least one IADL after 2 years of follow-up, between elderly patients followed by a family practitioner using the AGE assessment and management tool, and elderly patients followed in usual care. We assume that 25% are expected to lose at least one IADL after 2 years without intervention.

Hypothesis 1.2:

The null hypothesis is that there is no difference in the proportion of patients having lost at least one ADL after 2 years of follow-up between elderly patients followed by a family practitioner using the AGE assessment and management tool and elderly patients followed in usual care.

The alternative hypothesis is that there will be a difference of at least 15% in the proportion of patients having lost at least one ADL after 2 years of follow-up, between elderly patients followed by a family practitioner using the AGE assessment and management tool and elderly patients followed in usual care.

Hypothesis 1.3:

The null hypothesis is that there is no difference in the proportion of patients having lost at least one ADL of the combined IADL and ADL after 2 years of follow-up between elderly patients followed by a family practitioner using the AGE assessment and management tool and elderly patients followed in usual care.


The alternative hypothesis is that there will be a difference of at least 15% in the proportion of patients having lost at least one ADL of the combined IADL and ADL after 2 years of follow-up, between elderly patients followed by a family practitioner using the AGE assessment and management tool and elderly patients followed in usual care.

2. The AGE tool used in family medicine improves the quality of life of elderly patients.

Hypothesis 2.1:

The null hypothesis is that there is no difference in the evolution of the total transformed scale of the WHOQOL-OLD score after 2 years of follow-up between elderly patients followed by a family practitioner using the AGE assessment and management tool and elderly patients followed in usual care.

The alternative hypothesis is that there will be a difference in the evolution of the standardised in total transformed scale of the WHOQOL-OLD score (0 to 100) after 2 years of follow-up, between elderly patients followed by a family practitioner using the AGE assessment and management tool and elderly patients followed in usual care.

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Hypothesis 2.2:

The null hypothesis is that there are no differences in all facets of the WHOQOL-OLD transformed total score after 2 years of follow-up between elderly patients followed by a family practitioner using the AGE assessment and management tool and elderly patients followed in usual care.

The alternative hypothesis is that there will be a difference on a transformed total score scale of 0 to 100) in at least one of the six facets of the WHOQOL-OLD score after 2 years of follow-up, between elderly patients followed by a family practitioner using the AGE assessment and management tool and elderly patients followed in usual care.

3. The AGE tool used in family medicine reduces the incidence of hospital admissions

Hypothesis 3.1:

The null hypothesis is that there is no difference in the admission rate (number of admission per person-year) between patients of intervention and control arm

The alternative hypothesis is that there will be a relative difference of at least 10% in the admission rate (number of admission per person-year) between patients of intervention and control arm

4. The AGE tool used in family medicine reduces the incidence of institutionalizations

Hypothesis 4.1:

The null hypothesis is that there is no difference in the institutionalization rate (number of institutionalization per person-year) between patients of intervention and control arm

The alternative hypothesis is that there will be a relative difference of at least 10% in the institutionalization rate (number of institutionalization per person-year) between patients of intervention and control arm

Hypothesis 4.2:

The null hypothesis is that there is no difference in the time to institutionalization between patients of intervention and control arm

The alternative hypothesis is that there will be a difference in the time to institutionalization between patients of intervention and control arm

5. The AGE tool used in family medicine reduces the incidence of emergency visits


Hypothesis 5.1:

The null hypothesis is that there is no difference in the emergency visit rate (number of emergency visit per person-year) between patients of intervention and control arm

The alternative hypothesis is that there will be a relative difference of at least 10% in the emergency visit rate (number of emergency visit per person-year) between patients of intervention and control arm

6. The AGE tool used in family medicine impacts on the number of FP outpatient visits

Hypothesis 6.1:

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The null hypothesis is that there is no difference in the consultation rate (number of FP consultation per person-year) between patients of intervention and control arm

The alternative hypothesis is that there will be a difference of at least 10% in the consultation rate (number of FP consultation per person-year) between patients of intervention and control arm

7. The AGE tool used in family medicine improves the processes of care (diagnoses and management) of elderly patients

Hypothesis 7.1:

Use of the AGE tool increases the number of chronic conditions diagnosed, in particular for diagnoses specifically relevant in the context of geriatric syndromes

Hypothesis 7.2:

Use of the AGE tool increases the number of patients referred to a specialist

Hypothesis 7.3:

Use of the AGE tool enhances clinical assessment of patients

Hypothesis 7.4:

Use of the AGE tool enhances communication between FPs and home-based care

Hypothesis 7.5:

Use of the AGE tool enhances communication between FPs and patient families

Hypothesis 7.6:

Use of the AGE tool limits polymedication

Hypothesis 7.6:

Use of the AGE tool limits the number of potentially inappropriate medications

The changes in these processes of care will be described by arm, without a formal predefined hypothesis to test.

8. The AGE tool used in family medicine is acceptable and feasible for patients and family practitioners


Hypothesis 8.1

At least 50% of physicians in the intervention arm used the BAT at least once

Hypothesis 8.2

At least 50% of physicians in the intervention arm used the BAT at least once for all their patients included in the study

Hypothesis 8.3

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At least 50% of the patients included in the intervention arm had a BAT result

Hypothesis 8.4

At least 50% of the patients who had a BAT once had a second BAT repeated after one year

Hypothesis 8.5

When using the BAT, physicians reported at least 50% of the items (4 out of 8 syndromes screened)

Hypothesis 8.6

When using the BAT, physicians reported at least 87.5% of the items (7 out of 8 syndromes screened)

Hypothesis 8.7

Agreement between BAT result and physician judgement was at least moderate ($\kappa > 0.4$) in suspecting geriatric syndromes

Hypothesis 8.8

A plan of care is completed in at least 50% of patients with a suspected geriatric syndrome

Hypothesis 8.9

Adhesion to the recommendations of the plan of care is documented in at least 50% of patients with a suspected geriatric syndrome

Qualitative analysis

In addition, the following aspects will be evaluated in the qualitative analysis: acceptability and feasibility of the intervention, and of perceptions of autonomy in elderly patients and family physicians

Safety:

- The AGE tool administered in family medicine does not impact the quality of life, hospitalization and death rate of elderly patients.


Hypothesis 9.1:

The incidence rate of severe adverse events (SAE) (per person-year) in the intervention group does not exceed incidence rate in the control group (relative difference $< 10\%$)

Hypothesis 9.2:

The total WHOQOL-OLD score of patient in the intervention group is not inferior (difference < 5 points on a transformed scale of 0 to 100) to the score of patients in the control group

Hypothesis 9.3:

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The admission rate (number of admission per person-year) in the intervention group does not exceed admission rate in the control group (relative difference <10%)

Hypothesis 9.4:

The institutionalization rate (number of institutionalization per person-year) in the intervention group does not exceed institutionalization rate in the control group (relative difference <10%)

Hypothesis 9.5:

The death rate (number of deaths per person-year) in the intervention group does not exceed death rate in the control group (relative difference <10%)

Economic analysis

Hypothesis 10.1

Use of the AGE tool increases in ambulatory costs (number of consultations, referrals, investigations)

Hypothesis 10.2

Use of the AGE tool decreases medication costs

Hypothesis 10.3


Use of the AGE tool decreases the number of hospitalization, institutionalization, and use of home-based care

3. MODIFICATIONS OF STUDY OBJECTIVES DURING THE STUDY

Protocol amendment 04/09/2017, approved by CER-VD on 27.09.2017:

Preliminary analysis of baseline data of the first 247 patients showed that the majority of patients had a baseline IADL score of 8. Therefore, initial assumption of a mean score of 5 and use of a Poisson model were not appropriate anymore. We reformulated our hypothesis to show a difference in the proportion of patients not independent on IADL, i.e. patients that score less than 8 IADL[1]. Also, we refined the intraclass correlation estimation for the sample size calculation, because by contrast with our previous AGE1 and AGE2 study, IADL are assessed by a single rater in AGE3. However, the effect of the intervention itself might differ by FP, causing some degree of intracluster correlation after 2 years in the intervention arm.

However, after realizing that many men start below 8 not because of a loss of independence, but because they never performed some activities done by their spouse, we further reformulated our hypothesis to show a difference in "incident disability", i.e. patients that lose at least one IADL between baseline and after 2 years [1].


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4. STUDY DESIGN

Controlled, open label, cluster randomized superiority trial. The unit of randomization is a family practitioner (FP). FP are recruited in french-speaking Switzerland and randomly allocated (1:1 ratio) to one of the two parallel arms (AGE or usual care). A total of 46 FP's will be recruited by arm. Ten patients aged 75 years and over will be recruited per FP. Therefore in total 46 FP's and 460 patients will be involved (see sample size estimate below). The follow-up of patients will be for 2 years per patient.

Efficacy :

1. The AGE tool used in family medicine reduces the functional decline of elderly patients.
Outcome: Activities of daily living (ADL) score and instrumental ADL (IADL) score
Source: Phone interview
Recoding: Category of patients with at least one loss of IADL, respectively ADL and IADL + ADL, between baseline and 2 years.
2. The AGE tool used in family medicine improves the quality of life of elderly patients.
Outcome: Health related quality of life (WHOQOL-OLD) score
Six facets: 1) Sensory abilities, 2) Autonomy, 3) Past, present and future activities, 4) Social participation, 5) Death and dying and 6) Intimacy
Source: Phone interview
Recoding: according to WHO Manual (The WHOQOL-OLD module – manual, WHO European office, May 2006):
 - Recoding of negatively worded items
 - Summing items belonging to a facet (raw facet score; range 4 to 20)
 - Standardising mean facet score (raw facet score divided by number of items, any decimal value between 1 and 5)
 - Transferring to raw score to a transformed scale score between 0 and 100
 - Similarly, adding the facet scores to constitute a total raw score, a total standardized mean score and a total transformed (0 to 100) score
3. The AGE tool used in family medicine reduces the incidence of hospital admissions
Outcome: Incidence of hospital admissions (number of admission per person-year of follow-up)
Source: FP medical record
Recoding: Exclusion of hospital admissions <24 hours (corresponding to ambulatory visits but reported by mistake in this section)

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4. The AGE tool used in family medicine reduces the incidence of institutionalizations
Outcome: Incidence of institutionalization (number of institutionalization per person-year of follow-up)


Source: FP medical record

Recoding: none
5. The AGE tool used in family medicine reduces the incidence of emergency visits
Outcome: Incidence of emergency visits (number of emergency visits per person-year of follow-up)
Source: FP medical record

Recoding: none
6. The AGE tool used in family medicine impacts on the number of FP outpatient visits
Outcome: Incidence of outpatient visits (number of outpatient visits per person-year of follow-up)
Source: FP medical record

Recoding: none
7. The AGE tool used in family medicine improves the processes of care (diagnoses and management) of elderly patients

Outcome:
 - Number of geriatric syndromes identified, respectively confirmed, in intervention arm
 - Number of new chronic conditions diagnosed after baseline, in particular:
 - o Rectal incontinence – D17
 - o New eye condition (entire F group, F83 (retinopathy), F84 (macular degeneration), F94 (blindness))
 - o New ear condition (entire H group, H02 (hearing problem) H86 (deafness))
 - o New transitory ischemic incident (H89), cerebrovascular event (H90), cerebrovascular disease (K91)
 - o New osteoporosis (L95)
 - o New urinary incontinence (U04)
 - o New dementia (P70), memory disorder (P20), depression (P76)
 - o New fracture (L72 to L76)
 - o Source: Process questionnaire, data from medical records
 - Comparison of a selected number of managements strategies between intervention and control arm
 - o Hip replacement (medical record)
 - o Knee replacement (medical record)
 - o Cataract intervention (medical record)
 - Comparison of patient follow-up
 - o Number of consultations
 - o Number of contact with family / helpers, physically or by phone
 - o Number of contact with home-based care
 - o Number of specialist referrals: ophthalmologist, gynaecologist, urologist, neurologist, geriatrician, rheumatologist, orthopedist, ENT, dentist, memory clinic, other.
 - o Number of phone contact with geriatrician


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- Number of weight assessments
- Number of height assessment
- Clinical examination: neurological, osteoarticular, digestive, urogenital or anal, mouth, vision
- Evaluation of alcohol consumption, nutrition (food intake), physical exercise
- Score use: MMSE, Moca, GDS, IADL, other
- Prescription of home-based care, physiotherapy, ergotherapy, pelvic physiotherapy, urinary protection, physical exercise, nutrition supplements
- Comparison of investigations
 - Blood count, HbA1c, creatinine clearance, liver function tests, gammaGT, Na, K, Ca, vitamin B12, Folic acid, urinary stick, thyroid function, cerebral RMN, osteodensitometry
- Comparison of medication
 - Number of patients on Calcium and/or vitamin D (A12AX00)
 - Number of patients with biphosphonates
 - Number of patients on anticholinergic
 - Number of patients with antidepressant
 - Number of patients with precognitive medication
- Deprescription
 - Number of oral+ parenteral medication
 - Number of potentially inappropriate prescriptions (PIMs) according to 2015 Beers criteria
 - Specific PIMs (ATC code):
 - Benzodiazepines and other psychotropic medications (N05 N06)
 - Statins (C10A)
 - Drugs at risk orthostatic hypotension: peripheral and central alpha-1 blockers (C02CA)
 - Hypoglycaemic drugs (chlorpropamide A10BB02, glyburide A10BB01, insulin A10A)

8. The AGE tool used in family medicine is acceptable and feasible for patients and family practitioners

Outcome:

- Proportion of physicians in the intervention arm using the BAT at least once
- Proportion of physicians in the intervention arm using the BAT at least once for all their patients included in the study
- Proportion of physicians in the intervention arm using the BAT a second time, after using it the first time
- Proportion of use of the different items contained in the BAT
- Proportion of adhesion the different items contained in the plan of care, separated into investigations and attitudes
- By section: proportion of FPs adhering to at least half of the recommended investigations, respectively attitudes
- Agreement between assessment by the BAT and by FP
- Qualitative analysis of acceptability and feasibility of the intervention, and of perceptions of autonomy in elderly patients and family physicians

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Safety:

9. The AGE tool administered in family medicine does not impact the quality of life, hospitalization and death rate of elderly patients.

Outcome:

- Annual incidence of SAE between intervention and control arm (nb of events per person-year)
 - o Recoding: SAE reviewed by study coordinator to check if really fitting SAE definition
- Annual incidence of admissions between intervention and control arm (nb of events per person-year)
- Annual mortality rate between intervention and control arm (nb of deaths per person-year)
- WHOQOL-OLD score between intervention and control arm

Economic analysis

Outcome: incremental cost-effectiveness ratio par preserved ADL

Hypothesis 10.1

Use of the AGE tool increases in ambulatory costs

Outcomes:

- o Billing data of GPs for patients included in the study
- o Number of consultations,
- o Number of referrals,
- o Number of investigations

Hypothesis 10.2

Use of the AGE tool decreases medication costs

Outcomes:


- o Prescription data by ATC-code
- o Estimated cost difference between arms for medications with at least 5% difference in prescription by arm.

Hypothesis 10.3

Use of the AGE tool decreases the number of hospitalization, institutionalization, and use of home-based care

Outcomes:

- o Number of hospitalizations
- o Number of institutionalization
- o Time to institutionalization
- o Use of home-based care (use / no use and frequency of use)

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5. POPULATION - SAMPLING

Sampling

The study will be conducted in primary care practices located in the canton of Vaud. Because target of FP recruitment proved difficult to achieve in only one canton, the study was extended to FPs working in other french-speaking cantons of Switzerland (Valais, Neuchâtel and Fribourg) in January 2017. The study is will be proposed to any patients aged 75 years or older being followed-up in a FP practice consulting during the recruitment period. Before starting enrolment, FP decide whether they prefer to propose the study consecutively to all eligible patients until 12 are enrolled, or whether they prefer to propose the study to only one patient per consultation day, selected randomly. Random selection is done by tossing a coin (if two patients) or drawing a number from a bag containing numbered chips corresponding to the numbers of eligible patients.

Details about recruitment procedure and eligibility criteria can be found in the study protocol.

Sample size calculation

In order to estimate the sample size needed for our purposes, we assumed that 10% of patients would lose independence in at least one activities (IADL) in the intervention group, compared with 25% in the control group. This is in line with what was observed in other similar interventional studies[2].

A mixed effect logistic model was adopted in order to describe data, with a doctor-related random effect. With these parameters, cluster data were generated with n FP's per group and m patients per FP ($n = 5, 10, \dots, 55, 60$; $m = 5, 10, \dots, 25, 30$). For each combination of n and m , 10'000 datasets were generated and the power was empirically calculated as the percentage of datasets on which a significant ($\alpha=0.05$) difference between the two arms was obtained via the logistic mixed effect model, for different levels of ICC. Results are shown in Figure 1. In the absence of available data of intracluster coefficient (ICC) for such a type of interventions, and with an ICC of 0 at baseline, we expect only a cluster effect in half of the participants after 2 years (intervention arm), which we postulated to be 0.10 considering the standardized nature of the intervention.

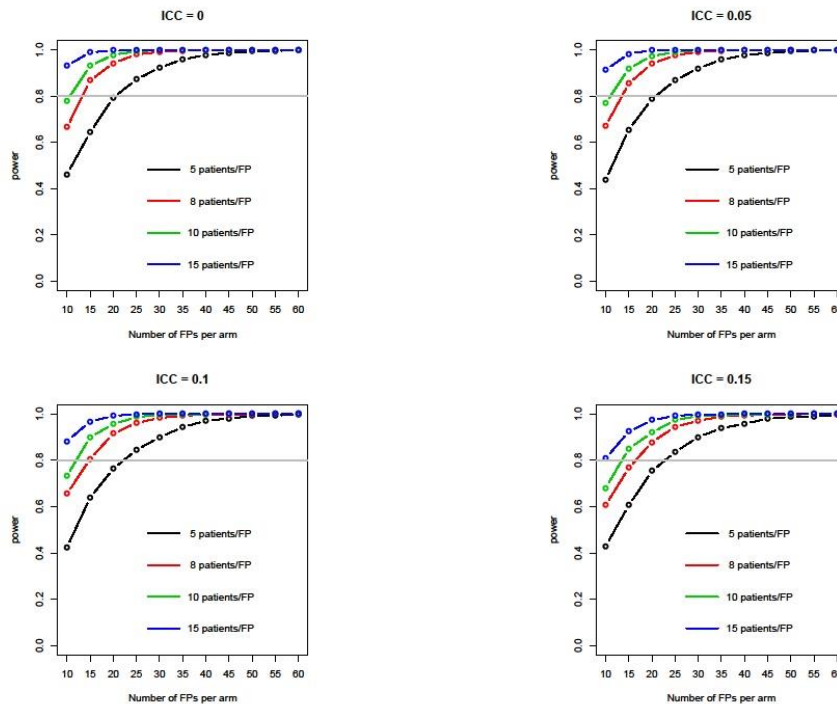


Figure 1. Simulation for sample size calculation

This approach allows choosing the best cluster combination that includes also feasibility considerations. For example to achieve a power of 90%, 8 patients per FP are sufficient if we have 20 FP's per arm, based on an ICC is 0.10. Taking into account the loss to follow-up estimated at 15%, we increased the number of patients per FP to $8/(1-0.15)=10$, corresponding to a total of **40 FP's and 400 patients**.

Sample size calculation was based on IADL because of the larger variance observed in this variable with respect to ADL on AGE 1 data. It represents therefore the "worst case scenario".

Qualitative sub-study

The study population for the qualitative evaluation is a subset of the AGE3 trial study population. We aim to recruit about 20 patients and 6 to 8 physicians, before reaching data saturation.


The sample size for patients has been estimated in order to cover the main patient constellations in terms of age, gender, support by home care, level of profession, and geography (rural/semi-urban/urban residence).

For physicians, we aim for a balanced age and sex distribution. In addition, we will consider group versus single practice and canton (Vaud versus other), as well as their practice location (rural/semi-urban/urban).

Randomisation, arm allocation and blinding

Randomisation

The randomisation unit will be the family practitioner, allocated on a 1:1 ratio to the intervention or usual

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care group. Randomisation will take place during training sessions organised during half a day for FPs participating in the study.

Participating FPs will be given a unique ID at the time of the previsit by the study staff. An independent statistician generated a randomisation list based on uneven block size. He will then prepare sealed opaque envelopes containing the allocation arm, with a printed number (identification number, ID) on the outside. When attending the training session, the FP opened the envelope corresponding to his unique ID. The allocation lists (containing the identification number and allocation after each randomisation session) was kept in sealed envelopes by the PI.

Blinding procedures

FPs and study participants will be unblinded to their allocation. The study staff (medical assistant) performing the main outcome measures (phone interviews) is blinded to the allocation. The study coordinator in charge of study and data monitoring also is also blinded to the allocation. The study assistant that conducts the annual visits to the family practice is not blinded to the allocation. Data related to the BAT specifically will be monitored by the unblinded study assistant and an external statistician. The study statistician in charge of the interim and final analysis will be blinded to the allocation.

Allocation masking


Allocation will be recorded into the eCRF because this information is necessary to determine which forms the FP has to complete, but it will not be visible to users (study staff). The forms recording information on the AGE tool will not be accessible to users apart from FP and study assistant conducting annual visits. Data monitoring of AGE-specific sections will be performed on unlinked datatables, after recoding of the identifier by an external datamanager so that it cannot be linked to patient or FP. Queries will be transmitted back to the FP through this data manager.

Details about procedures to minimize risk of bias can be found in the study protocol.

6. GLOSSARY OF STUDY VARIABLES


Main outcomes :

- Activities of daily living (ADL) score and instrumental ADL (IADL) score[3, 4]
The use of (instrumental) "activities of daily living" scales (IADL and ADL) is the simplest and most reliable way to assess functional decline. According to previous studies using this outcome in similar populations, one point (= one activity) lost avoided out of 8 activities (for IADL) over 1 year can be considered as a significant and meaningful improvement.[2, 5]
These two instruments have been used in numerous studies, are sensitive to change and foremost can be reliably administered by phone[6, 7] . Although very frequently used, psychometric properties of this scale can be questioned, in particular because of a marked ceiling effect [8]. Also, many items of the classic ADL scales are gender-specific, and reduced scores can be more related to traditional roles in society more than actual disability.
- Health related quality of life (WHOQOL-OLD) score [9, 10]
- This broadly validated instrument is composed of six facets: 1) Sensory abilities, 2) Autonomy, 3) Past, present and future activities, 4) Social participation, 5) Death and dying and 6) Intimacy. [10] Like with ADL and IADL, this questionnaire can be administered by phone. Pre-post intervention studies testing the effect of hearing aids and cardiac surgery


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among elderly people have reported improvements between 2 and 8 points/100[11-14]. Comparisons of mean scores were usually based on paired t-tests, sometimes also used adjusted linear models. One study has compared the proportion of patients with improved / no change / worsened WHOWOL-OLD score[11]. We found no population-based data reporting longitudinal evolution of WHOQOL-OLD score in the absence of intervention.


Variable name	Data table	Variable type : Categoric, ordinal, quantitative	Modalities (coding)	Description	Recoding
tel	5.Téléphone	Ordinal	1 Vous utilisez le téléphone de votre propre initiative, cherchez les numéros, appelez, répondez, etc. 2 Vous n'appelez que quelques numéros bien connus 3 Vous répondez au téléphone, mais n'appelez pas 4 Vous n'utilisez pas le téléphone 9 Ne sait pas / ne veut pas répondre / non évaluable	IADL	1/3=1 4=0 9=.
comm	5.Téléphone	Ordinal	1 Vous vous occupez de tous les achats et commissions, indépendamment 2 Vous vous occupez uniquement de petits achats 3 Vous avez besoin d'être accompagné(e) pour chaque commission 4 Vous êtes complètement incapable de faire vos commissions 9 Ne sait pas / ne veut pas répondre / non évaluable	IADL	1=1 2/4=0 9=.
repas	5.Téléphone	Ordinal	1 Vous planifiez, préparez et servez des repas adéquats, de façon indépendante 2 Vous préparez des repas adéquats, pour autant que la matière première soit fournie 3 Vous réchauffez des repas ou préparez des repas MAIS ne maintenez pas une diète adéquate 4 Vous avez besoin d'avoir des repas préparés et servis 9 Ne sait pas / ne veut pas répondre / non évaluable	IADL	1=1 2/4=0 9=.

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menage	5.Téléphone	Ordinal	<p>1 Vous vous occupez du ménage seul(e) ou avec de l'assistance occasionnelle (p.ex. travaux de réparation lourds)</p> <p>2 Vous vous occupez seulement de tâches ménagères légères comme laver la vaisselle ou faire le lit</p> <p>3 Vous vous occupez seulement de tâches ménagères légères MAIS êtes incapables de maintenir un niveau de propreté adéquat</p> <p>4 Vous nécessitez de l'assistance pour toutes les tâches ménagères, mais vous participez</p> <p>5 Vous ne participez pas aux tâches ménagères</p> <p>9 Ne sait pas / ne veut pas répondre / non évaluable</p>	IADL	1/4=1 5=0 9=.
lessive	5.Téléphone	Ordinal	<p>1 Vous faites toute votre lessive</p> <p>2 Vous ne vous occupez que de « petite lessive » (p.ex. chaussettes, etc)</p> <p>3 Toute la lessive doit être faite par d'autres personnes</p> <p>9 Ne sait pas / ne veut pas répondre / non évaluable</p>	IADL	1/2=1 3=0 9=.
transports	5.Téléphone	Ordinal	<p>1 Vous voyagez indépendamment en utilisant les transports publics ou votre propre voiture</p> <p>2 Vous voyagez indépendamment en taxi MAIS n'utilisez pas d'autres transports publics</p> <p>3 Vous voyagez en utilisant les transports publics MAIS uniquement lorsqu'accompagné-e</p> <p>4 Vous voyagez uniquement en taxi ou automobile et avec accompagnement</p> <p>5 Vous ne voyagez pas du tout</p> <p>9 Ne sait pas / ne veut pas répondre / non évaluable</p>	IADL	1/3=1 4/5=0 9=.
medic	5.Téléphone	Ordinal	<p>1 Vous êtes entièrement responsable de prendre vos médicaments à dose correcte et horaire prescrit</p> <p>2 Vous êtes responsable de prendre vos médicaments s'ils sont préparés à l'avance en doses séparées</p> <p>3 Vous êtes incapable de prendre seul-e vos médicaments</p> <p>9 Ne sait pas / ne veut pas répondre / non évaluable</p>	IADL	1=1 2/3=0 9=.

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finances	5.Téléphone	Ordinal	1 Vous vous occupez de vos paiements et finances indépendamment (vous payez le loyer, faites vos paiements, etc.) 2 Vous vous occupez des paiements quotidiens, MAIS nécessitez de l'aide pour maintenir les autres 3 Vous êtes incapable de vous occuper des paiements 9 Ne sait pas / ne veut pas répondre / non évaluable	IADL	1/2=1 3=0 9=.
hygiene	5.Téléphone	Ordinal	1 Vous ne recevez aucune assistance 2 Vous recevez de l'assistance pour laver une partie du corps (dos ou jambes) 3 Vous recevez de l'assistance pour laver plus qu'une partie du corps 9 Ne sait pas / ne veut pas répondre / non évaluable	bADL	1/2=1 3=0 9=.
habil	5.Téléphone	Ordinal	1 Vous prenez vos habits de l'armoire et des tiroirs et vous vous habillez sans assistance 2 Vous prenez vos habits de l'armoire et des tiroirs et vous vous habillez sans assistance, à l'exception des chaussures 3 Vous recevez de l'assistance pour prendre vos habits, ou pour vous habiller, ou vous ne vous habillez pas vous-mêmes 9 Ne sait pas / ne veut pas répondre / non évaluable	bADL	1/2=1 3=0 9=.
toilet	5.Téléphone	Ordinal	1 Vous allez aux toilettes, vous vous nettoyez et vous vous rhabillez sans assistance 2 Vous recevez de l'assistance pour aller aux toilettes ou pour vous nettoyer après ou pour vous rhabiller ou pour l'utilisation du vase, de l'urinal ou de la chaise percée 3 Vous ne pouvez pas utiliser les toilettes 9 Ne sait pas / ne veut pas répondre / non évaluable	bADL	1=1 2/3=0 9=.
transfert	5.Téléphone	Ordinal	1 Vous sortez, entrez dans le lit ou d'une chaise sans assistance (peut utiliser une canne ou un déambulateur) 2 Vous sortez et entrez dans le lit ou d'une chaise avec assistance seulement 3 Vous ne sortez pas du lit 9 Ne sait pas / ne veut pas répondre / non évaluable	bADL	1=1 2/3=0 9=.

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continence	5.Téléphone	Ordinal	1 Vous contrôlez urine et selles totalement de vous-même 2 Vous avez des « accidents » occasionnels 3 Vous nécessitez une supervision pour rester propre ou vous nécessitez un cathéter, ou vous êtes incontinent 9 Ne sait pas / ne veut pas répondre / non évaluable	bADL	1=1 2/3=0 9=.
aliment	5.Téléphone	Ordinal	1 Vous vous nourrissez sans assistance 2 Vous vous nourrissez seul mais nécessitez de l'assistance pour couper la viande ou beurrer le pain 3 Vous recevez de l'assistance pour vous nourrir ou vous êtes nourri partiellement ou complètement par sonde ou en parentéral (intraveineux) 9 Ne sait pas / ne veut pas répondre / non évaluable	bADL	1/2=1 3=0 9=.
f25_1	5.Téléphone	Ordinal	1 Pas du tout, 2 Un peu, 3 Modérément, 4 Beaucoup 5 Enormément 9 Ne sait pas / ne veut pas répondre / non évaluable	WHOQOL-OLD	9=. 1=1 4=2 5=5
f25_3	5.Téléphone	Ordinal	1 Pas du tout, 2 Un peu, 3 Modérément, 4 Beaucoup 5 Enormément 9 Ne sait pas / ne veut pas répondre / non évaluable	WHOQOL-OLD	9=. 1=1 4=2 5=5
f26_1	5.Téléphone	Ordinal	1 Pas du tout, 2 Un peu 3 Modérément, 4 Beaucoup 5 Extrêmement 9 Ne sait pas / ne veut pas répondre / non évaluable	WHOQOL-OLD	9=.
f26_2	5.Téléphone	Ordinal	1 Pas du tout, 2 Un peu 3 Modérément, 4 Beaucoup 5 Extrêmement 9 Ne sait pas / ne veut pas répondre / non évaluable	WHOQOL-OLD	9=.
f26_4	5.Téléphone	Ordinal	1 Pas du tout, 2 Un peu 3 Modérément, 4 Beaucoup 5 Extrêmement 9 Ne sait pas / ne veut pas répondre / non évaluable	WHOQOL-OLD	9=.

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f29_2	5.Téléphone	Ordinal	1 Pas du tout, 2 Un peu 3 Modérément, 4 Beaucoup 5 Extrêmement 9 Ne sait pas / ne veut pas répondre / non évaluable	WHOQOL-OLD	9=. 1= 4=2 5
f29_3	5.Téléphone	Ordinal	1 Pas du tout, 2 Un peu 3 Modérément, 4 Beaucoup 5 Extrêmement 9 Ne sait pas / ne veut pas répondre / non évaluable	WHOQOL-OLD	9=. 1= 4=2 5
f29_4	5.Téléphone	Ordinal	1 Pas du tout, 2 Un peu 3 Modérément, 4 Beaucoup 5 Extrêmement 9 Ne sait pas / ne veut pas répondre / non évaluable	WHOQOL-OLD	9=. 1= 4=2 5
f29_5	5.Téléphone	Ordinal	1 Pas du tout, 2 Un peu 3 Modérément, 4 Beaucoup 5 Extrêmement 9 Ne sait pas / ne veut pas répondre / non évaluable	WHOQOL-OLD	9=. 1= 4=2 5
f25_4	5.Téléphone	Ordinal	1 Pas du tout, 2 Un peu 3 Modérément, 4 Beaucoup 5 Entièrement 9 Ne sait pas / ne veut pas répondre / non évaluable	WHOQOL-OLD	9=. 1= 4=2 5
f26_3	5.Téléphone	Ordinal	1 Pas du tout, 2 Un peu 3 Modérément, 4 Beaucoup 5 Entièrement 9 Ne sait pas / ne veut pas répondre / non évaluable	WHOQOL-OLD	9=.
f27_3	5.Téléphone	Ordinal	1 Pas du tout, 2 Un peu 3 Modérément, 4 Beaucoup 5 Entièrement 9 Ne sait pas / ne veut pas répondre / non évaluable	WHOQOL-OLD	9=.
f27_4	5.Téléphone	Ordinal	1 Pas du tout, 2 Un peu 3 Modérément, 4 Beaucoup 5 Entièrement 9 Ne sait pas / ne veut pas répondre / non évaluable	WHOQOL-OLD	9=.

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f28_4	5.Téléphone	Ordinal	1 Pas du tout, 2 Un peu 3 Modérément, 4 Beaucoup 5 Entièrement 9 Ne sait pas / ne veut pas répondre / non évaluable	WHOQOL-OLD	9=. f28_4 f28_4
f27_5	5.Téléphone	Ordinal	1 Très insatisfait-e, 2 Insatisfait-e 3 Ni satisfait-e, ni insatisfait-e 4 Satisfait-e, 5 Très satisfait-e 9 Ne sait pas / ne veut pas répondre / non évaluable	WHOQOL-OLD	9=.
f28_1	5.Téléphone	Ordinal	1 Très insatisfait-e, 2 Insatisfait-e 3 Ni satisfait-e, ni insatisfait-e 4 Satisfait-e, 5 Très satisfait-e 9 Ne sait pas / ne veut pas répondre / non évaluable	WHOQOL-OLD	9=.
f28_2	5.Téléphone	Ordinal	1 Très insatisfait-e, 2 Insatisfait-e 3 Ni satisfait-e, ni insatisfait-e 4 Satisfait-e, 5 Très satisfait-e 9 Ne sait pas / ne veut pas répondre / non évaluable	WHOQOL-OLD	9=.
f28.7	5.Téléphone	Ordinal	1 Très insatisfait-e, 2 Insatisfait-e 3 Ni satisfait-e, ni insatisfait-e 4 Satisfait-e, 5 Très satisfait-e 9 Ne sait pas / ne veut pas répondre / non évaluable	WHOQOL-OLD	9=.
f27.1	5.Téléphone	Ordinal	1 Très malheureux/se, 2 Malheureux/se 3 Ni heureux/se, ni malheureux/se 4 Heureux/se, 5 Très heureux/se 9 Ne sait pas / ne veut pas répondre / non évaluable	WHOQOL-OLD	9=.
f25.2	5.Téléphone	Ordinal	1 Très mauvais, 2 Mauvais 3 Ni bon, ni mauvais, 4 Bon 5 Très bon 9 Ne sait pas / ne veut pas répondre / non évaluable	WHOQOL-OLD	9=.
f30.2	5.Téléphone	Ordinal	1 Pas du tout, 2 Un peu, 3 Modérément, 4 Beaucoup 5 Enormément 9 Ne sait pas / ne veut pas répondre / non évaluable	WHOQOL-OLD	9=.

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f30.3	5.Téléphone	Ordinal	1 Pas du tout, 2 Un peu 3 Modérément, 4 Beaucoup 5 Extrêmement 9 Ne sait pas / ne veut pas répondre / non évaluable	WHOQOL-OLD	9=.
f30.4	5.Téléphone	Ordinal	1 Pas du tout, 2 Un peu 3 Modérément, 4 Beaucoup 5 Entièrement 9 Ne sait pas / ne veut pas répondre / non évaluable	WHOQOL-OLD	9=.
f30.7	5.Téléphone	Ordinal	1 Pas du tout, 2 Un peu 3 Modérément, 4 Beaucoup 5 Entièrement 9 Ne sait pas / ne veut pas répondre / non évaluable	WHOQOL-OLD	9=.

Composite variables:

Variable name	Data table	Variable type	Modalities (coding)
		: Categoric, ordinal, quantitative	
avqi	5.Téléphone	Ordinal	Avqitel +avqicomm +avqirepas +avqimenage +avqilessive +avqitransports +avqimedic +avqifinances
avqb	5.Téléphone	Ordinal	avqbhygiene +avqbbabil+avqbtoilet +avqbtransfert+avqbcontinence+avqb
avqtot	5.Téléphone	Ordinal	avqi+avqb
OLD_SAB_s	5.Téléphone	Ordinal	f25_1_rec+ f25_3_rec+ f25_4_rec+ f25_2
OLD_AUT_s	5.Téléphone	Ordinal	f26_1 +f26_2 +f26_4 +f26_3
OLD_PPF_s	5.Téléphone	Ordinal	f27_3 +f27_4 +f27_5 +f27_1
OLD_SOP_s	5.Téléphone	Ordinal	f28_4+ f28_1 +f28_2 +f28_7
OLD_DAD_s	5.Téléphone	Ordinal	f29_2_rec +f29_3_rec +f29_4_rec +f29_5_rec
OLD_INT_s	5.Téléphone	Ordinal	f30_2 +f30_3 +f30_4 +f30_7
OLD*_m	5.Téléphone	Quantitative	Mean scores (1 to 5)
OLD*_t	5.Téléphone	Quantitative	Standardized scales (0 to 100) = 100*(mean score – 1)/4


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OLD_total_s	5.Téléphone	Ordinal	OLD_SAB_s+OLD_AUT_s+OLD_PPF_s+OLD_SOP_s+OLD_DAD_s+OLD...
OLD_total_n	5.Téléphone	Ordinal	anycount(f25_1_rec f25_3_rec f25_4_rec f25_2 f26_1 f26_2 f26_4 f26_3 / f27_3 f27_4 f27_5 f27_1 f28_4 f28_1 f28_2 f28_7 f29_2_rec f29_4_rec f29_5_rec /// f30_2 f30_3 f30_4 f30_7), values(1/5)
OLD_total_m	5.Téléphone	Quantitative	OLD_total_s/OLD_total_n
OLD_total_t	5.Téléphone	Quantitative	Standardized scales (0 to 100) = 100*(mean score – 1)/4

Outcomes 3 to 6:

- Incidence of hospital admissions (number of admission per person-year of follow-up)
- Incidence of institutionalizations (number of institutionalizations per person-year of follow-up)
- Incidence of emergency visits (number of emergency visits per person-year of follow-up)
- Number of FP outpatient visits

Variable name	Data table	Variable type : Categoric, ordinal, quantitative	Modalities (coding)	Description	Recoding
dateinc	3.Inclusion	Date		Date of inclusion	-
datefin	8.FinSuivi	Date		Date of end of follow-up	Actual date of decision to follow-up (or withdrawal) correspond to datefin, in v cas it is manually recoded. =datedec if death before
Hospit	6.Processus	Binary	1 Oui, 0 Non, 9 Ne sait pas	Any admission	Recoded 0 stohosp-sta (less than 2
Institcourt	6.Processus	Binary	1 Oui, 0 Non, 9 Ne sait pas	Any short institutional stay	
institlong	6.Processus	Binary	1 Oui, 0 Non, 9 Ne sait pas	Any long institutional stay	

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cslt	6.Processus	Binary	1 Oui, 0 Non, 9 Ne sait pas	Any emergency consultation
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Composite variables:


Variable name	Data table	Variable type : Categoric, ordinal, quantitative	Modalities (coding)	Description
Futime		Quantitative	Datefin-dateinc	Duration of follow-up in the study
Nhosp	e_6_proc_hosp bloc within 6.Processus	Quantitative	Sum of number of hospitalisation	
ninstit	e_6_proc_instit bloc within 6.Processus	Quantitative	Sum of number of short institutional stays + institlong	
ncons	e_6_proc_cons bloc within 6.Processus	Quantitative	Sum of FP consultations	

Process of care outcomes

Variable name	Data table	Variable type : Categoric, ordinal, quantitative	Modalities (coding)	Description	Recodage
dateinc	4.egb	Date		Number of geriatric syndromes identified, respectively confirmed, in intervention arm	-
datefin	8.FinSuivi	Date		Date of end of follow-up	Actual decision of follow-up (consent withdrawal) not coded to date, which manual recode =datefin of death datefin

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Hospit	6.Processus	Binary	1 Oui, 0 Non, 9 Ne sait pas	Any admission	Recorded stay longer than 2
Institcourt	6.Processus	Binary	1 Oui, 0 Non, 9 Ne sait pas	Any short institutional stay	
institlong	6.Processus	Binary	1 Oui, 0 Non, 9 Ne sait pas	Any long institutional stay	
csit	6.Processus	Binary	1 Oui, 0 Non, 9 Ne sait pas	Any emergency consultation	
Contpro	6.Processus	Binary	1 Oui, 0 Non, 9 Ne sait pas	Au cours de l'année écoulée, selon le dossier médical, le médecin a-t-il eu contact avec les proches, physiquement ou par téléphone ?	
Contprophys	6.Processus	Quantitative		Nombre d'entretiens face-à-face	
contprotel	6.Processus	Quantitative		Nombre d'entretiens téléphoniques	
Contcms	6.Processus	Quantitative		Contact with home-based care	
ncontcms	6.Processus	Quantitative		Number of contact with home-based care (contcmsphys+contcmstel+contcmslet)	
ophthalmo gyneco uro neuro geriatr rhumato ortho orl dentiste memoir specaut	6.Processus	Binary		Number of specialist referrals: ophthalmologist, gynaecologist, urologist, neurologist, geriatrician, rheumatologist, orthopedist, ENT, dentist, memory clinic, other.	
contgertel	6.Processus	Quantitative		Number of phone contact with geriatrician	
exneuro exos exdig exuro exdent exvis	6.Processus	Binary	1 Oui, 0 Non, 9 Ne sait pas	Clinical examination: neurological, osteoarticular, digestive, urogenital or anal, mouth, vision	

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evalof evalalim evalexe	6.Processus	Binary	1 Oui, 0 Non, 9 Ne sait pas	Evaluation of alcohol consumption, nutrition (food intake), physical exercise
scmmse scmoka scgds scavqi scaut	6.Processus	Binary	1 Oui, 0 Non, 9 Ne sait pas	Score use: MMSE, Moca, GDS, IADL, other
ordcms ordergo ordphys ordspec ordurin ordex ordprot ordaut*	6.Processus	Binary	1 Oui, 0 Non, 9 Ne sait pas	Prescription of home-based care, physiotherapy, ergotherapy, pelvic physiotherapy, urinary protection, physical exercise, nutrition supplements
fs hba1c clair asat ggt nak ca b12 folate stix thyr irm densito	6.Processus	Binary	1 Oui, 0 Non, 9 Ne sait pas	Comparison of investigations <ul style="list-style-type: none"> Blood count, HbA1c, creatinine clearance, liver function tests, gammaGT, Na, K, Ca, vitamin B12, Folic acid, urinary stick, thyroid function, cerebral RMN, osteodensitometry

Composite variables:

Variable name	Data table	Variable type : Categoric, ordinal, quantitative	Modalities (coding)	Description
Nsynd	4.egb	Discrete	urin dep cog vis aud chute osteo denut if (tot`x'==1 tot`x'`ver==1) +1 if ((chute==1 marche==1)) & totchut!=1 & totchutver!=1	Number of geriatric syndromes identified in intervention arm as to BAT (tot) or according to FP (ver)
Nsyndconf	4.egb / 6.Processus	Discrete	Sum of: <ul style="list-style-type: none"> New ccu04 diagnosis (urinary incontinence) Confirmed depression depconf or new ccp76 Confirmed cognitive disorder cogconf or new ccp70 or ccp20 New eye condition (entire F group, F83 (retinopathy), F84 (macular degeneration), F94 (blindness)) New ear condition (entire H group, H02 (hearing problem) H86 (deafness)) 	Number of newly identified geriatric syndromes in intervention arm (as to control arm but without EGB var)

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			<ul style="list-style-type: none"> - Chute OR marche - Fracture OR new osteoporosis (ccl95) OR new fracture L72 to L76 - Denutrition (T08 OR T91? Not optimal!) 	
Pthnew	6.Processus	Binary	Pth (end) – pth (baseline)	Number of patient new hip replacement since baseline
Ptgnew	6.Processus	Binary	Ptg (end) – ptg (baseline)	Number of patient new knee replacement since baseline
Catanew	6.Processus	Binary	Cataract (end) – cataract (baseline)	Number of patient new hip replacement since baseline
Npoids	e_6_proc_cons 6.Processus	Discrete		Number of weight assessments
nweight	e_6_proc_cons 6.Processus	Discrete		Number of height assessment
nbmed	12.Traitement	Discrete		Number of oral+parenteral medication
nbcats	12.Traitement	Categorical	1 "0-4" 2 "5-9" 3 "10-14" 4 "15+"	Category of polymedication
maxA12AX00	12.Traitement	Binary		Number of patient Calcium and/or Vitamin D
maxM05B	12.Traitement	Binary		Number of patient bisphosphonates, other drugs affecting bone mineralization, bone structure
?	12.Traitement	Binary		Number of patient anticholinergic
maxN06A	12.Traitement	Binary		Number of patient antidepressant
maxN06D	12.Traitement	Binary		Number of patient precognitive medication
npim	12.Traitement	Discrete	Manual recoding from David	Number of potential inappropriate prescriptions (PI) according to 2011 criteria
maxN06A	12.Traitement	Binary		Number of patient antidepressant


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maxN05 maxN06	12.Traitement	Binary	Specific PIM: Benzodiazepine other psychotropic medications
maxC10A	12.Traitement	Binary	Specific PIM: St
maxC02CA	12.Traitement	Binary	Specific PIM: Dr risk orthostatic hypotension: per and central alpha blockers
maxA10BB01 maxA10BB02 maxA10A	12.Traitement	Binary	Specific PIM: Hypoglycaemic (chlorpropamide A10BB02, glybu A10BB01, insuli
	12.Traitement	Binary	Specific PIM:

Feasibility and acceptability outcomes

Composite variables

Variable name	Data table	Variable type : Categorical, ordinal, quantitative	Modalities (coding)	Description
gpanyegb	4.EGB	Quantitative	Per FP: N with at least one dateegb not missing	Proportion of ph in the interventio using the BAT a once
anyegb	4.EGB	Quantitative	Per patient: N with at least one dateegb not missing (withdrawal within 3 months of inclusion excluded)	Proportion of ph in the interventio using the BAT once for all their included in the s
anyrepegb	4.EGB	Quantitative	Per patient: N with at least two dateegb not missing (withdrawal within 3 months of inclusion excluded)/ N still under FU 1 year after inclusion	Proportion of ph in the interventio using the BAT a time, after using first time
fonct1 fonct2 fonct3 fonct4 urg temps effort protur	4.EGB	Quantitative		Proportion of us different items contained in the

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depr
plaisir
horl
mots
oeild
oeilg
oreild
oreilg
chute
marche
fracture
diff1
diffail
parocc
paroccfait
cotbass
poids0
poids1
perte1
poids6
perte6

Not detailed 4.EGB

Proportion of ad
the different item
contained in the
care, separated
investigations an
attitudes

Not detailed 4.EGB

By section: prop
FPs adhering to
half of the
recommended
investigations,
respectively attit


Tot*acc and
tot*ver 4.EGB

Agreement betw
assessment by t
and by FP

Safety outcomes

Composite variables

Variable name	Data table	Variable type :	Modalities (coding)	Description
totSAE	11.SAE / logSAE	Quantitative	Recoding: SAE reviewed by study coordinator to check if really fitting SAE definition	Annual incidence between inter and control arm events per person

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Death	11.SAE	Binary	11.SAE: Categsae==1 OR 8.FinSuivi: motif==1 Manual recoding if death info but no record in SAE, and according to date of death	Annual mortality between intervention and control arm deaths per person
--------------	--------	--------	---	--

Economic analysis:

Variables included in "process of care", and billing data

Composite variables

Variable name	Data table	Variable type : Categorical, ordinal, quantitative	Modalities (coding)	Description
totmontprest	13.prestation	Quantitative	Sum of all montprest	Sum of all billed amounts between inclusion and follow-up


7. STATISTICAL ANALYSES

7.1 INTERMEDIATE ANALYSES

Analysis of baseline data will be conducted by the coPI once recruitment is complete. Mean and variance of IADL were assessed in slightly different patient populations than the AGE3 study population. If the analysis of baseline data shows important discrepancies compared to the assumptions made for the initial sample size calculation (baseline IADL, intra-class correlation), a new sample size estimation may be performed. If recruitment of additional FPs is needed to need sufficient power, this will be discussed with the steering committee and the protocol will be amended accordingly.

One interim analysis will be performed when at least 50% of patients have had their one year assessment. The interim analysis will be performed by the study statistician. If a difference on the main outcome (IADL) superior to the one expected after two years (difference in proportion having lost at least 1 IADL>15%) is observed between the two groups, the code will be broken and if it is shown that the difference is in favor of the intervention arm, the AGE tool will be offered to the patients of the usual care group. This decision will be made in collaboration with the steering committee. No futility rule is planned, as we acknowledge that the effect of the intervention may be somewhat delayed and therefore not necessarily apparent after one year only.

An annual safety analysis will be done by the study coordinator, comparing the incidence of hospital admissions and deaths between both groups. This will be included in the annual safety report submitted to the steering committee and the Ethics committee. If there is a significant difference ($p < 0.05$) between the two groups in terms of hospital admissions and deaths, the steering committee can decide to halt the study.

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7.2 FINAL DATA ANALYSIS

7.2.1 Data management

Dataset

The AGE3 dataset consists of 685 variables for approximately 460 patients, organized in 13 study-specific forms.

Forms

0. Contact
1. Médecin
2. Screening
3. Inclusion
4. EGB (Evaluation Gériatrique Brève)
5. Téléphone
6. Processus
7. Visites
8. FinSuivi
9. PlanSoins
11. SAE
12. Traitement
13. Prestations

Data are specified in an excel file describing each variable, variable label, type, value label, condition, limits and error messages.

Volume : Aug2017 : 288 Ko for Raw data (zipped csv file), 1.4 Mo for .dta files.

Expected volume at the end of study: 1 Mo for raw data.

Storage volume for incremental monthly extracts: about 1 Go

Qualitative evaluation

- Audio files and transcripts of patient observation, physician interviews and patient interviews
- MaxQDA files

Data collection:

The AGE3 database was designed using the secuTrial software, version 4.8.0.19. Data are stored in an Oracle database (v11), managed by the Informatic System Department of the CHUV, Lausanne.


Access:

The data manager has access to all study data (raw data extracts) and is in charge of preparing these extracts for data monitoring and analysis. In particular, he will remove contact details, recode age in years and remove date of birth, and unlink BAT and AGE related information from the unique identifier.

He has no role in data analysis per se.

The study statistician cannot enter or modify data but has access to all the study data, except contact details. BAT and AGE plan of care (which would reveal allocation) will only be linked to specific patients after completion of the ITT analysis.

Electronic and central data validation

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AGE3 data are collected via secuTrial.

Predefined checks incorporated in secuTrial are:

concern mainly

- Respect of the time intervals between annual study visits.
- Height (≥ 120 and <220 cm)

Secutrial software has an inbuilt data management tool allowing investigators to produce queries.

Each form is revised by a member of the study staff. After solving of the pending queries, each form is locked, preventing further modification.

Completion status of each section was predefined during database development. The secuTrial system includes visual aid to inform of data entry completion.

Monthly exports of the data as .csv files are performed by the data manager and stored in her personal folder. Data are then transformed to respect anonymisation (excluding Contact information) and blinding of study coordinator (_4_egb and _10_plansoins forms unlinked to study ID), and stored in .dta format for further management within Stata.

The study coordinator performs monthly data monitoring. These data extracts are stored in a securised folder on the Polyclinique Médicale Universitaire's server until the final analysis is completed.

The study coordinator analyses the data on a monthly basis, to identify missing items or discrepancies. If these are not, an electronic query is made in secuTrial to the person responsible of data entry for this section, who will see it and try to resolve it the next time the database is entered. Paper-based queries will be used for FP using paper data collection.

Source data validation (when applicable) is performed by the study assistant during his/her annual visits to each practice ("review A"). These visits are also an opportunity to solve all remaining queries. A final data validation takes place when data entry is considered complete. The database will be locked after all study data have been validated and monitoring review has been completed.

Data recoding:

- Removal of "test patients" from the dataset (patients created while training study physicians in using the secutrial, ID terminating by 00).
- Recoding of dates in Stata date formats (saved as strings in initial extracts)
- Treatments: manual review of treatment without ATC-code, for data entry mistakes or items missing in the predefined treatment list


09.07.2020:

Cleaning of screening form :

- 28 missing date of screening – 23 missing date of birth (incl 12 missing both): date of screening replaced by random date between minimum and maximum date of screening of same idmed

Cleaning of Processus form

- Removal of hospital admission <24hours.
- Correction of date of inclusion recorded in processus form based on information from inclusion form
- Number of consultations per year : recalculated based on date of inclusion
- Date of admission and institutionalization : attributed to year 1 and year 2 based on date of inclusion and date of end-of –follow-up

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Data versioning and naming:

- Raw data extracts are saved every month in the "Raw" folder, sub-folder with the extraction date
- Recoded data are saved every month in the "Rec" folder, sub-folder with the extraction date
- At the end of data collection, a final dataset will be extracted and used for final analysis.

Metadata:

Project level:

Identifier:

Creator: Yolanda Müller Chabloz

Affiliation: Department for ambulatory Care and Community Medicine – University of Lausanne – Switzerland

Title: Active Geriatric Evaluation program – AGE4: Implementation of an electronic comprehensive assessment and management tool for geriatric syndromes in family medicine

Date: 2018 - 2021

Language: french

Funder: Swiss National Fund

Hosting Institution: Department for ambulatory Care and Community Medicine – University of Lausanne – Switzerland

["Readme" file to be developed]

In addition to the study-specific variables, the following information is associated with each data export:

cn/casenodes : Table de base avec une ligne par patient

- mnppid : Identifiant patient secTrial permettant de lier avec les autres tables.
- (Add-ID) mnpaid : Identifiant du sujet.

(Centre information) ctr/centres : Table des centres

(Queries and Comments) cts/comments & qas/queries : tables des commentaires et requêtes.

- fcolname : Nom de la variable associée
- qacdate : Date du commentaire/requête
- qaccontent : Contenu du commentaire/requête.

(Project Setup)


1. vp/visit plan : Liste des visites (visitid + label)
2. vpfs/visitplan forms : Relation entre visite et formulaire (visitid + formid)
3. fs/forms : Liste des formulaires et sous-formulaires associés (formid + tablename + name)
4. qs/questions : Liste des groupes d'items (séparé par ligne blanche sur l'interface)
5. is/items : Liste des variable avec le libellé associé (colname + label)

_xxx : tables associées à chaque formulaire

- mnppid : Identifiant patient
- mnpdocid : Identifiant de l'enregistrement.
- mnpvisid : Identifiant de la visite
- mnpvisno : Numéro de la visite
- mnpvispdt : Date de la visite
- mnpvisfdt : Date de la première saisie de donnée

e_xxx : tables associées aux sous-formulaires

- mnppid : Identifiant patient
- mnpdocid : Identifiant de l'enregistrement (pour lier à la table mère)
- position : Numéro de répétition-1

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Data access

- The AGE3 secutrial database is accessed via an internet browser. Each user has a specific user name and login allowing access to different sections of the data. For example, contact information is only available to the study staff that needs to contact the patients.
- Data are crypted for transfer.
- Data are stored on the server of the CHUV, Lausanne (for storage and back-up specificaiton, see 3.1).
- Data extracts are stored on the NAS-CHUV.
- Access to different parts of the data on the NAS are also defined according to different user rights.

Data ownership

The dataset is propriety of the University Institute of Family Medicine of the Department of Ambulatory Care and Community Medicine, University of Lausanne.
Deidentified data will be shared under a creative common CCBY license.

Data storage

Secutrial data are stored by the Service d'Informatique of the CHUV, Lausanne (DSI-CHUV), who is responsible data storage and back-up system.

During data collection, monthly raw extracts are saved by the data manager on the server of the Department of Ambulatory Care and Community Medicine, University of Lausanne

2 copies of the data are stored in two separate locations by the DSI CHUV.

Data archiving

The final recoded dataset will be stored in .csv format on the server of the Department of Ambulatory Care and Community Medicine, University of Lausanne.

Other essential documents including anonymous screening logs will be stored in pdf format on the server of the Department of Ambulatory Care and Community Medicine, University of Lausanne

Nominative inclusion logs will be stored as paper format and stored in the ISF, but electronic forms will be destroyed.

All contact information will be destroyed at the end of data collection.

All study data will be archived for a minimum of 10 years after study termination or premature termination of the clinical trial. Electronic data will be stored at the Lausanne University Hospital server.

Paper study data (apart from source medical files which will remain in the FP's practice and stored according to specific regulation) will be stored at the Polyclinique Médicale Universitaire in Lausanne for a period of ten years under the responsibility of the principal investigator.


Access to data for analysis:

- Study statistician (Isabella Locatelli): access to raw and recoded data
- Study coordinator (Yolanda Müller): access to recoded data

Parts of the recoded data will be shared with partners for the following subanalyses:

Polymedication:

- 6. Processus + 12.Traitement + 3.Inclusion shared with medical student working on polymedication

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- Recoded and anonymised data (containing patient study ID, medication, and coded diagnosis) will be shared with the Pharmacy staff of the HUG (Geneva University Hospital) for running the PIM-check tool (automated analysis of inappropriate medication)
- Economic analysis
 - Access to recoded data will be given to Clémence Perraudin, health economist at the Department of Ambulatory Care and Community Medicine, and used for the costing of the intervention
- Qualitative evaluation
 - Access to sociologist (Joëlle Schwarz) and physician (Ophélie Viret) in charge of qualitative evaluation of the AGE tool

Data sharing

Published data will be made available in a non-for-profit repository such as Zenodo after publication

There are limitations on data sharing in order to protect human personal data.

Prof. Senn will decide when to publish and if it is possible to make Research Data accompanying the article publicly available including whether to supply research data to a new user.

Data deidentification will be conducted by a data manager to make anonymized datasets publicly available.

In particular:

- Physician and patient ID will be recoded
- Location will be discarded (canton, CMS)
- Date of birth replaced by age in years at inclusion
- All dates referring to a specific patient will be shifted by a random number of days (consultation dates, hospitalization date, etc)
- Removal of free text fields (comments, details on profession)
- SAE information

Softwares for data analysis


- Stata 15.1 (College Station, USA)
- R
- MaxQDA for qualitative analysis

7.2.1.1 Missing Data

As recommended for pragmatic trials (and nowadays for clinical trials in general), we shall follow an Intention-to-treat approach. However, we shall face the problem of a high number of missing outcome data, considering that many patients approach end-of-life age.

Main outcome - ADL

Missing outcome data are expected to occur mainly because of death considering the age of participants, and because of consent withdrawal (patients refusing to answer phone questionnaire). Missing outcome data cannot be considered missing completely at random, as patients approaching end-of-life, usually with a worse functional status, are more likely to refuse to answer the questionnaire. However, ADL may be imputed (assuming a Missing at random MAR mechanism) using following covariates: age, sex, ADL and IADL at baseline (and at 1 year if available), schooling, previous profession, living alone, using home-based care, frequency of contact with children and “proches aidants”, driving, intervention arm and GP random intercept.

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We shall start by doing a complete case analyses, completed by the following simple imputations:

- Patients who died before end-of-follow-up are considered to have declined functionally
- Patients who are institutionalized before the end of the study and who withdrew (without measured outcome) are considered to have declined functionally

Sensitivity analyses

- Last observation carried forward: ADL result at 1 year carried forward to 2 years if missing and patient not dead
- Worst-case scenario: all missing cases considered as having lost at least one ADL
- Best-case scenario: all missing outcome considered as having maintained ADL
- Multiple imputation of ADL data, based on baseline and 1-year values, age, sex, schooling, previous profession, living alone, using home-based care, frequency of contact with children and “proches aidants”, driving, intervention arm and GP random intercept

Main outcome – WHOQOL-OLD

Partly missing WHOQOL:

As recommended by the guidelines for scoring WHOQOL, if one of the items of a specific domain is missing, a domain score should be calculated by substituting a person specific average across the completed items in the same scale. If two or more items are coded missing in these two domains, the domain score should not be calculated.

Completely missing WHOQOL:

- If the patient died, we shall considered his score to be 0 (standardised scale).
- Multiple imputation of WHOQOL-score, using baseline and 1-year values, age, sex, schooling, previous profession, living alone, using home-based care, frequency of contact with children and “proches aidants”, driving, intervention arm and GP random intercept

Other outcomes


For time to event analysis (time to institutionalization, time to death), drop-outs will be censored. If date of end of follow-up is missing, we shall randomly select date between last consultation recorded and date of reported end of follow-up.

Otherwise, we expect that missing data among the planned adjustment factors will be limited. Multiple imputation is therefore not planned for additional variables.

We do not expect major missingness in variables collected as part of the medical file. Some events may not be recorded in the medical file and will not be captured by our data collection, but we have no ways of correcting this. Process data might be more difficult to obtain in the control group because of less attention given to file notes, resulting in a higher number of missing data. This will be checked in the interim analysis.

7.2.1.2 Extreme values

Predefined checks included in the data collection software prevented a number of aberrant values. For the main outcomes, model post-estimation will include assessment of outliers, which may be excluded on a case-by-case assessment.

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7.2.2 Descriptive analyses

7.2.2.1. Data cleaning

Data monitoring will be done continuously (at least monthly) by the study coordinator, blinded to group allocation. BAT data will be monitored separately, after unlinking of the data with patient and FP identifier.

7.2.2.2. Descriptive analysis

For continuous variables: mean, standard deviation, interquartile range, min/max and boxplot, per arm
For ordinal variables: median, interquartile range, mode, min/max and bar plot, per arm
For categorical variables: Cross-tabulation, per arm

7.2.2.3. Demographical characteristics

Basic sociodemographic and clinical characteristics (comorbidities) of patients and FP characteristics will be described for both arms.

Patient characteristics will also be compared by sex/gender.

7.2.3 Multivariate analyses

Hypothesis 1.1

The primary analysis will compare the difference in proportion of patients having lost at least 1 IADL after 2 years between intervention and control group, using a generalised 2-level linear mixed model with a logit distribution. Clustering by FP will be taken into account by the mixed model („physician effect“). Baseline and 1-year IADL will be included in the model if available (repeated measures). Important determinants of FP variance will be explored and included in the model if relevant (practice size and type, age, gender of FP, specialty type, comprehensiveness of care)


The following analyses are also planned to be performed by the study statistician after database closure:

- Difference in proportion of patients having lost at least 1 ADL after 2 years between intervention and control group, using a generalised linear mixed model
- Difference in WHOQOL-OLD after 2 years between intervention and control group, using a generalised linear mixed model
- Difference in IADL, ADL and WHOQOL-OLD difference (delta) between baseline measurement and after 2 years between intervention and control group, using a generalised linear mixed model

For the primary outcome, subgroup analysis will be performed by patient characteristics (gender, age category, baseline disability, comorbidities) and FP characteristics (gender, age, urban/rural/semi-urban)

- Number of hospital admissions, institutionalizations, emergency visits and routine visits using a linear mixed model
- Survival analysis of time to institutionalization and time to death

For process evaluation, the number of geriatric syndromes suspected, confirmed and acted upon will be compared after 2 years. Implementation of management strategies (investigations, medication adaptation, referral to specialty care, supportive measures) included in AGE will be compared

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	SOP CRC-CHUV DM201 AN01	
	SOP AGE3 DM AN01	Version : V02
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	Révision :	
	Approbation:	IL, NS

between both groups, based on the information in the medical file. Based on a predefined scale, FP adhesion to the AGE tool will be estimated for each patient.


Sensitivity analyses

We will also whether the primary outcome is dependent of the % adhesion to AGE. A complier average causal effect analysis will be used to estimate the effect of the intervention in the intervention group, had all FPs adhered to it [15, 16].

A more classical "per protocol" analysis will restrict the analysis to the population of patients in the intervention group which had both BAT performed (at least 7 out of 8 items screened) in the planned timeframe, and at least 50% adherence of FP to the AGE tool.

Qualitative analysis

A thematic analysis will be performed throughout the data collection using MaxQDA. A first code system will be derived from the response to research questions. After review of the material by the first coder, the material will be coded again independently by a second researcher and results will be compared in order to ensure coding consistency (cross-checking procedure). Codes will be encompassed in themes with a broader level of meaning and organized in a way that answers the research questions.

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