

**VOLUMETRIC VISUAL FIELDS AT INTERMEDIATE AND NEAR
DISTANCES IN PRESBYOPIC PATIENTS USING OCCUPATIONAL
AND GENERAL-PURPOSE PROGRESSIVE ADDITION LENSES**

Single-center, randomized, double-blind, crossover clinical trial evaluating differences in volumetric visual fields at intermediate and near distances among three progressive addition lens (PAL) designs in presbyopic patients.

Acronym: CIVIUS2025PAL

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Study Protocol Summary

Title:

Single-center, randomized, double-blind, crossover clinical trial evaluating differences in volumetric visual fields at intermediate and near distances among three progressive addition lens (PAL) designs in presbyopic patients.

Brief Summary

Presbyopia is an age-related condition characterized by progressive loss of accommodation, resulting in reduced near and intermediate visual performance, visual fatigue, and decreased comfort during daily tasks. Progressive addition lenses (PALs) are commonly prescribed to compensate for presbyopia. General-purpose PALs (GP-PALs) are designed to provide vision correction from distance to near vision, whereas occupational PALs (PC-PALs) are optimized for intermediate and near visual tasks, particularly for office and computer use.

Although previous studies have evaluated visual satisfaction and performance with different PAL designs, no studies to date have quantitatively assessed the volumetric extent of clear vision between 4 m and 25 cm using different PAL configurations.

The aim of this clinical trial is to compare the volumetric clear vision fields produced by three PAL designs:

- one general-purpose PAL (VIMAX FIT FRM),
- and two occupational PALs (VIMAX PC 1.5 FWD 4 m and VIMAX ZOOM 1.5 FWD 4 m),

all with plano distance power and +2.00 D near addition.

This is a single-center, cross-sectional, randomized, double-blind, crossover clinical trial conducted at the Faculty of Pharmacy, University of Seville. Approximately 23 to 66 presbyopic participants aged 52–67 years will be enrolled according to inclusion and exclusion criteria.

Each participant will undergo:

- ocular and refractive anamnesis,
- visual acuity assessment,
- accommodative amplitude measurement,
- objective refraction,
- binocular vision screening,
- ocular motility and visual field screening tests.

Participants will sequentially test the three PAL designs in randomized masked order. Using validated optotypes positioned at 4 m, 2 m, 1.33 m, 80 cm, 40 cm, and 25 cm,

horizontal and vertical limits of clear vision will be measured while head movements are restricted.

The primary outcome measure is the volumetric clear vision field (cm^3) generated between 4 m and the corneal apex for each lens design, calculated using a quadrangular frustum geometric model. Secondary outcomes include visual field surface areas at each testing distance and analysis of accommodative amplitude according to age, sex, and near-work habits.

The study is designed to evaluate differences in functional visual performance among PAL designs and to support personalized prescription strategies for presbyopic patients, particularly those requiring optimized intermediate and near vision for occupational tasks.

Study Design

- Interventional clinical trial
- Randomized
- Double-blind
- Crossover assignment
- Single-center
- Cross-sectional

Primary Outcome Measure

Volumetric clear vision field (cm^3) between 4 m and 25 cm for each PAL design.

Secondary Outcome Measures

- Visual field surface area at each tested distance

Population

Presbyopic adults aged 52–67 years with reduced accommodative amplitude (<3 D) and adequate binocular visual function.

Data Protection

Participant data will be pseudonymized and stored securely in password-protected electronic files and locked physical storage accessible only to the investigators. Data will be retained for one year and subsequently destroyed according to institutional data protection regulations.