Effectiveness of a novel digital patient education programme to support self-management of early rheumatoid arthritis: a randomised controlled trial

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ABSTRACT

Objectives To evaluate the effectiveness of a novel digital patient education (PE) programme in improving self-management in patients newly diagnosed with rheumatoid arthritis (RA).

Methods This was a parallel, open-label, two arms, randomised controlled trial with superiority design. Patients from five rheumatology clinics were randomised into digital PE (intervention) or face-to-face PE (control). The primary outcome was self-efficacy, measured by average difference in the Rheumatoid Arthritis Self-Efficacy (RASE) score from baseline to month 12. Secondary outcomes were RA knowledge, health literacy, adherence, and quality of life. Healthcare utilisation data and digital PE programme usage were recorded. Self-efficacy, knowledge, and health literacy data were analysed using mixed-effects repeated measures modelling; adherence using logistic regression, and quality of life and healthcare utilization using descriptive statistics with the Wilcoxon rank-sum test.

Results Of the 180 patients randomised (digital PE, n=89; face-to-face PE, n=91), 175 had data available for analysis. Median age was 59.0 years, and 61% were women. The average difference in self-efficacy between groups from baseline to month 12 was significant by a -4.34 difference in RASE score, favouring the intervention group (95%CI -8.17 to -0.51; p=0.026). RA knowledge, health literacy, and quality of life showed minor improvements over time but no difference between groups, except out-patient clinic contacts which were fewer in the intervention group.

Conclusions The findings suggest that digital PE is effective in improving self-efficacy and therefore self-management in patients with early RA. This intervention has potential to lower healthcare costs by decreasing out-patient clinic contacts.

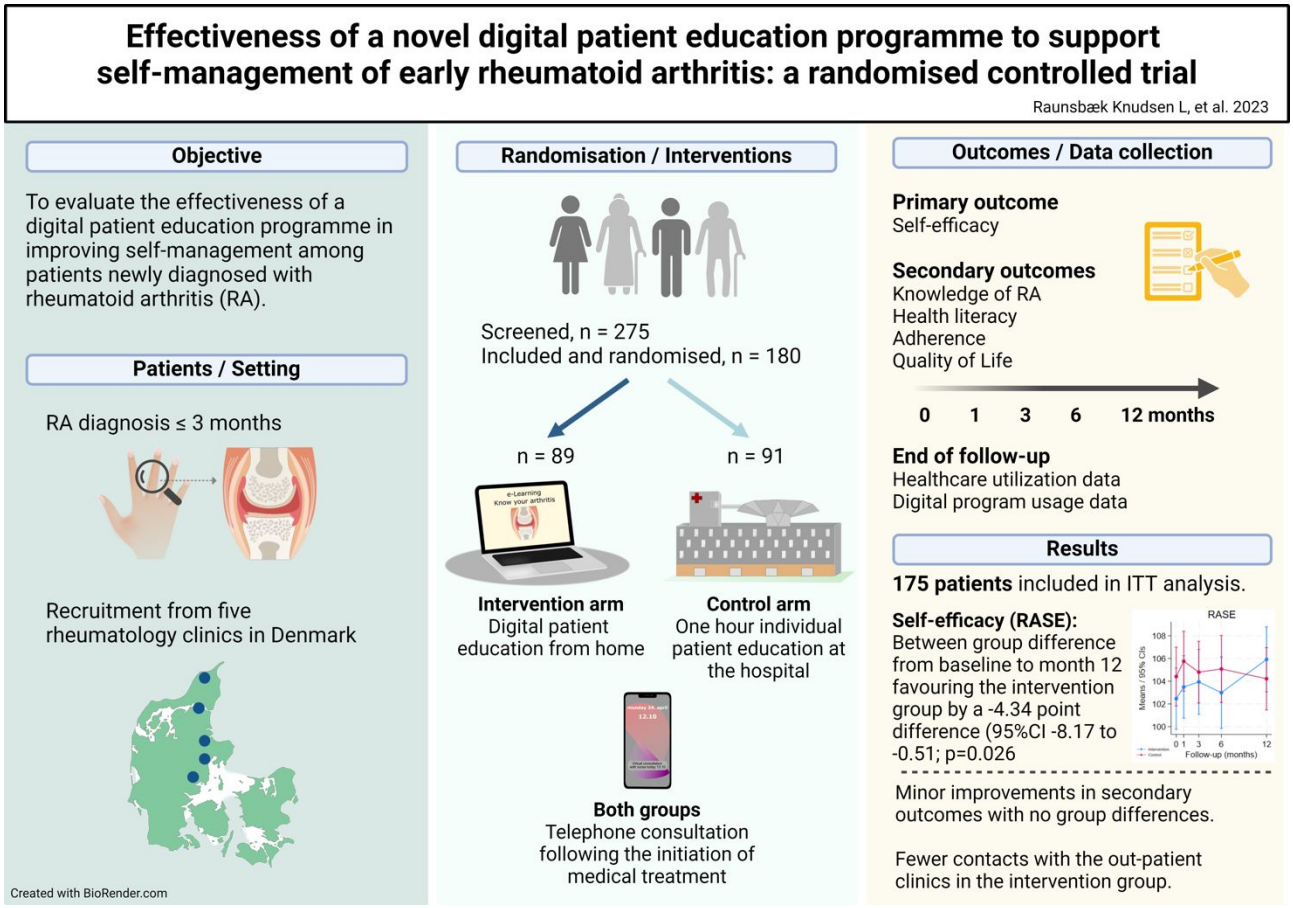
Trial registration number: clinicaltrials.gov, NCT04669340

KEYWORDS

Rheumatoid arthritis, digital patient education, self-management, tele-health, health services research.

KEY MESSAGES

- First randomised controlled trial evidence of digital patient education effectiveness in early rheumatoid arthritis.
- Digital patient education improved self-efficacy more than face-to-face education delivered by rheumatology nurses.
- Integration of digital patient education in the management of early rheumatoid arthritis is warranted.



Graphical abstract

INTRODUCTION

Rheumatoid arthritis (RA) is a systemic inflammatory condition primarily affecting joints and sometimes organs.[1] Despite advancement in treatment aiming for remission, low disease activity and reducing disability,[2] RA remains a chronic condition with fluctuating symptoms, and changes in medical treatments necessitating patient adjustments. Patients need to take an active role in understanding their condition, acquiring self-management skills, and engaging with healthcare services.[3] Patient education (PE) is the means by which patients can be supported to effectively self-manage.[2 4]

Previous research on digital PE in RA[5-11] have yielded varying results. Digital PE can improve outcomes such as self-efficacy and empowerment,[5 7-9] physical activity,[5 8] medication adherence,[10] disease knowledge,[9] and quality of life.[5 7] However, some studies have shown limited or no effects on outcomes such as disease activity,[6 10] health behaviours and health care utilisation,[5] as well as self-management behaviour, health status, fatigue, and pain.[11] These differences could stem from variations in interventions, outcomes, and follow-up period. Most of these RCTs had a relatively short follow-up period (1 to 6 months), and most included patients with long-standing RA. There is a lack of RCT evidence for digital PE in patients with newly diagnosed RA. This is important as self-management is essential from the initial diagnosis and continuing throughout the disease course.[3 4]

Digital PE has the potential to work well with telehealth interventions to enhance timely care and treatment amid healthcare system pressures.[3 12] We have developed a new digital PE programme for patients with RA; *'Know your rheumatoid arthritis'*,[13] and the objective of the present study was to evaluate the effectiveness of this programme in improving self-management in patients recently diagnosed with RA.

METHODS

Study design

This was a parallel, two arms RCT with superiority design, carried out at five rheumatology clinics in Denmark between 2021 and 2023. Ethical approval was given by the Central Denmark Region Scientific Committee (no. 1-16-02-52-19). The study is registered at ClinicalTrials.gov (Identifier NCT04669340), and the protocol has been published elsewhere.[14]

Participants

Between February 2021 and September 2022, we recruited participants from outpatient clinics who meet the following criteria: adults ≥18 years of age; RA classified according to the 2010 Rheumatoid arthritis classification criteria[15] within the past three months; able to read, speak and understand Danish; access to the Internet, a secure mail account to receive emails from the public sector, and a private email account. Exclusion criteria included prior participation in formal RA PE programme, and unwillingness to be randomly assigned to a group. After protocol publication,[14] we added an exclusion criterion for suspected dementia. Study nurses provided eligible patients with written and verbal information followed by time for deliberation, if needed. Subsequently, patients who voluntarily gave written informed consent were enrolled and randomised.

Randomisation

Randomisation was computer-generated using the Research Electronic Data Capture tool (REDCap).[16 17] Allocation lists for the REDCap randomisation-module were generated for treatment-groups using permuted blocks with random varying sizes of 4 and 6, stratified by study site, sex (male/female), and age (<70/70+). Proper concealment of randomization was obtained using an external randomisation service (Clinical Trial Unit, Department of Clinical medicine, Aarhus University, DK). Patients were randomised in a 1:1 ratio to either the intervention group or the control group by study nurses.

Intervention group

The intervention group was given digital PE, which was previously tested for acceptability and usability.[13] The digital PE programme was available immediately after randomisation, and remained accessible at no cost for participants to use at home and share with relatives. It

consisted of three modules, the first of which was mandatory to be completed within approximately one month after enrolment. Participants were reminded by email to complete module 1 three weeks after enrolment. The mandatory part focused on disease-specific knowledge, such as the typical disease course, causes, symptoms, methotrexate (MTX) treatment, and how to respond appropriately to flares, infections, and side-effects. The optional modules elaborated upon module 1, and added information on medical treatment, potential co-morbidities, physical and radiological examinations, as well as guidance and inspiration for managing symptoms, and coping with RA in everyday life.[13] The programme offered information through various means, including animations, graphics, videos, podcasts, written text, spoken content, and interactive tests to engage users and assess their knowledge of methotrexate, as well as appropriate responses to disease flares, side effects, or infections.[13]

Control group

The control group received usual care, that is a one-hour session of individual face-to-face PE facilitated by a rheumatology nurse at the hospital. Relatives could participate as per patient's wishes. The information and guidance were tailored to meet the specific needs of the individual; however, a slide deck was developed to guide the conversation and ensure uniformity. This face-to-face session and the creation of the slide deck were informed by patient education recommendations developed by the European Alliance of Associations for Rheumatology (EULAR).[4] During the session, various topics were covered, such as the basics of RA, the typical disease course, prognosis, medical treatment, emotional responses following diagnosis, as well as daily living strategies for managing RA.

Both groups

All patients were given written and verbal information about the medical treatment. At enrolment, they were provided with basic disease information, including its symptoms and disease signs, infections, and potential side-effects, to ensure that they were aware of how to respond appropriately and timely to disease flares or infections. All participants had a telephone consultation with a nurse approximately three weeks following initiation of MTX, which is first

drug of choice in Denmark, and had access to telephone contact and consultations in the clinics, as needed.

Data collection methods

After enrolment, sociodemographic data was collected by study nurses, while clinical and medical data were obtained from medical records. Primary and secondary outcomes were collected using patient self-administered questionnaires managed electronically through REDCap,[16 17] at baseline and at month 1, 3, 6 and 12 after enrolment, with automated reminders after 7 and 14 days. At the end of the follow-up period, healthcare utilisation data during the study period were retrieved from medical records, and digital PE programme usage data were extracted from the Learning Management System of the programme. All data were recorded in the electronic case report form in REDCap.[16 17]

Outcomes

The primary outcome was self-efficacy, measured by average changes in the Rheumatoid Arthritis Self-Efficacy (RASE)[18 19] scores from baseline to month 12 between groups. The RASE is validated into Danish and the score ranges from 28 to 140, with higher scores reflecting higher levels of self-efficacy.[18 19]

Secondary outcomes were: (i) Knowledge of RA and medication, assessed using the Danish version of the Patient Knowledge Questionnaire (PKQ-RA-11), with scores ranging from 0 to 11, higher scores indicating greater knowledge.[20-22] (ii) health literacy skills, using four sub-scales of the Health Literacy Questionnaire (HLQ), validated in the Danish population.[23 24] The following sub-scales were used; 2 "*Having sufficient information to manage my health";* 4 *"Social support for health";* 6 "*Ability to actively engage with healthcare providers";* and 9 "*Understand health information well enough to know what to do".* The score ranges from 1 to 4 in sub-scale 2 and 4, and 1 to 5 for sub-scale 6 and 9, higher scores indicating a better degree of health literacy.[23 24] (iii) Medication adherence, measured using the Compliance Questionnaire for Rheumatology 5 item (CQR5),[25] categorising patients into "high" or "low" adherence.[25] A reliability test of the Danish CQR19, from which the CQR5 was derived, established its test–retest reliability in patients newly

diagnosed with RA.[26] (iv) Health-related quality of life was measured using the EuroQoL (EQ-5D-5L) questionnaire,[27 28] including the overall health for the day by a 0 to 100 visual analogue scale (VAS), and the EQ-5D index value, that is a summary number reflecting a health state compared to the general population.[29 30] (v) Healthcare utilisation, measured by data on out-patient clinics visits and telephone contacts, and digital PE programme utilisation including information on the completion of modules.

Demographic data included age, sex, civil status, cohabitation, education, and employment. Clinical data encompassed laboratory results, 28-joint count, current RA treatment, and disease activity and health status assessments using the Disease Activity Score (DAS28),[31] the Clinical Disease Activity Index (CDAI),[31] and the Multidimensional Health Assessment Questionnaire (MDHAQ).[32]

Patient and public involvement

The study engaged two patient research partners who participated in the steering group.[14] They contributed to the planning of the RCT, developing the patient information material, and are part of dissemination and future implementation plans.

Sample size

The sample size was based on a previous RCT that found a mean difference of 15.5 in self-efficacy scores (Arthritis Self-Efficacy Scale (ASES)) between an intervention group receiving online education and a control group receiving standard face-to-face education.[7] We aimed to detect a difference of at least 10% in self-efficacy (which equates to 11.2 points on the RASE score[18 19]) between the groups from baseline to month 12 to ensure a clinical relevant difference. We needed 80 participants in each group to attain a significant difference with a statistical power of 90% and a significance level of 0.05. Thus, we planned to enrol 190 participants, considering a dropout rate of approximately 15%.

Statistical analysis

Baseline demographics and clinical characteristics were analysed descriptively using mean and standard deviation (SD) for normally distributed data, median and interquartile range (IQR) for

non-normally distributed data, and numbers and percentages for categorical and dichotomous variables.

Primary and secondary outcomes were analysed on an intention-to-treat (ITT) basis guided by random allocation (figure 1). We hypothesised that digital PE would be superior to face-to-face PE in improving self-efficacy. The RASE, PKQ-RA-11 and HLQ scores were analysed using a mixed-effects model, that is the two-way repeated measurements analysis of variance (ANOVA) with time, group, and interaction between them as factors, to evaluate changes over time within and between groups. Model check and assumptions of normality was verified using residuals plots. Results are presented as mean (SD), mean differences within and between groups at each time point, and the average difference between groups from baseline to 12 months with 95% confidence intervals (CI) and *p*-values. For the CQR5, we used a logistic regression model with time, group, and their interactions as factors, presenting results as odds ratios (OR) and relative odds ratios (ROR) with corresponding 95% CIs and *p*-values.

Analyses of RASE, PKQ-RA-11, HLQ, and CQR5 were adjusted for the following baseline variables; age, sex, disease activity (DAS28), and educational level. Unadjusted analyses were conducted to evaluate result robustness, considering the influence of selected factors, and potential impacts on interpretation and conclusions.

QoL index values and VAS scores were summarized using median (IQR), and differences between groups were analysed using Wilcoxon rank-sum test. Healthcare utilisation data and digital PE programme utilisation are presented as numbers and percentages, and differences in healthcare utilisation between groups were analysed using the Wilcoxon rank-sum test.

The rules for handling missing data due to incomplete responses to questionnaire items were followed where available. No imputation of missing data was performed as the mixed-effects model accounts for missing data by restricted maximum likelihood function. Statistical analyses were performed using STATA version 18.[33]

RESULTS

Participant and characteristics

A total of 180/275 patients were randomised, 89 assigned to the intervention group (84 [93.3%] completed follow-up) and 91 to the control group (91 [100%] completed follow-up). Five withdrew

as they did not have the emotional capacity to continue or regretted their decision to participate, therefore data for 175/180 patients were available for analysis. Figure 1 presents patients' flow from enrolment to data analysis. The questionnaire completion rates were: 100% for baseline, and 96.6%, 93.1%, 90.9% and 86.9%, at months 1, 3, 6 and 12, respectively.

Baseline demographics and characteristics were similar between groups with balanced representation from the five sites (table 1). The median age was 59.0 years, 61% were females, disease activity was moderate, and most were initially treated with methotrexate. Baseline data for those who withdrew is presented in supplementary table S1, available at *Rheumatology* online. Supplementary table S2 (available at *Rheumatology* online) presents the disease status and medical treatment by group at the end of the study.

Self-efficacy

The average difference in self-efficacy between groups from baseline to month 12 favoured the intervention group, with a -4.34-point difference in RASE score (95%CI -8.17 to -0.51, p=0.026) (table 2). This supports the hypothesis of superiority of the intervention over control.

Improvement in RASE score over time were demonstrated within the intervention group, with a statistically significant difference at month 12 compared to baseline (mean difference of 3.46; 95%CI 0.86 to 6.06). No such within-group differences were found in the control group (table 3, figure 2). There were no significant between-group differences at each time point (supplementary table S3, available at *Rheumatology* online).

Patient knowledge

There were no significant between-group differences in the overall average (baseline to month 12) scores (0.14; 95%CI -0.30 to 0.58; p=0.541) (table 2) or at any time point (supplementary table S4, available at *Rheumatology* online). Both groups demonstrated an initial increase in the mean PKQ score from baseline to month 1, which remained stable over time (figure 2). Both groups improved over time (supplementary table S5, available at *Rheumatology* online).

Health literacy

Generally, HLQ scores were high in both groups (supplementary table S4 and figure S1, available at *Rheumatology* online) but significant within-group changes were observed in HLQ2 scores at month 1 and remained stable thereafter. HLQ6 and HLQ9 scores increased in both groups with slightly later rises in the intervention group. No significant between-group differences or HLQ4 changes were observed (supplementary table S4 and S5). There were no significant between-group differences in the overall average scores from baseline to month 12 (table 2).

Adherence

There were no significant differences between the two groups in the odds for low adherence although the unadjusted analyses provided slightly different results showing the odds for low adherence being higher in the intervention group (supplementary table S6, available at *Rheumatology* online). However, the relative odds ratio between groups from baseline to month 12 was not significantly different in either the adjusted or unadjusted analysis (ROR=0.72; 95%CI 0.27 to 1.89; p=0.501) (table 2).

Quality of Life

High EQ-5D index values and high VAS scores were seen in both groups, and only minor changes over time were observed. No significant differences between groups were observed (supplementary table S7, available at *Rheumatology* online). With the EQ-5D-5L descriptives dichotomized into 'no problems' and 'any problems,' compared to baseline, there was a decrease in reported problems across all dimensions at month 12 follow-up (supplementary table S8, available at *Rheumatology* online).

Utilisation of health care

In general, the control group had more out-patient clinic contacts than the intervention group, especially for telephone contacts and planned visits with rheumatologists (Table 4). Most telephone contacts with nurses focused on guidance related to medical treatment (43.6% in the intervention group vs 38.7% in the control group). This was also true in the face-to-face consultations with nurses (74.3% in the intervention group vs 87.9% in the control group) (supplementary table S9, available at *Rheumatology* online).

Utilisation of e-Learning programme

The completion rate for the mandatory module 1 was 90.5%, 3.6% used it partially, and 5.9% did not use it at all. Of those completing the module, 72.3% did so within one month after enrolment. For the optional parts of the programme, module 2 was used by 65.5%, and module 3 by 48.8% of the participants. The average time spent in the first instance was 106.5 minutes (range 20 to 240 minutes).

DISCUSSION

This is the first RCT to investigate the effectiveness of digital PE for self-management of early RA. While the intervention outperformed control at 12 months, the effects (4.34-point RASE difference) fell short of our pre-hypothesised 10% target. The 95%CIs suggest a potential range from 0.5 to 8 points on the RASE score (small to large difference). A definition of a clinically important difference in self-efficacy using RASE is lacking. The only large-scale RCTs using the RASE is a Dutch study,[11] and this found no significant differences between groups. Evidence on self-efficacy using RASE, stems from studies of face-to-face PE programmes: an RCT in RA and psoriatic arthritis found a mean RASE score change of 7.08 (SD 12.08) in the intervention group;[34] a British validation study showed a mean RASE score increase of 5.2 (SD 15.5);[35] and a Danish validation study a mean RASE difference of 5.59 (SD 9.99) immediately after a PE course.[18] These modest RASE gains in other studies and limited RASE benchmarks raise questions about our chosen 10% threshold. Nevertheless, self-efficacy is crucial for effective self-management of chronic diseases,[36] and justified for use in face-to-face PE[34 37-39] and digital PE interventions[5 7 9 11] for RA.

Modest effects in our digital PE programme may be explained by lack of supplementary individual or group support for activities such as learning and practicing behaviours, receiving feedback for improvement, and setting goals all of which help improve self-efficacy.[5 7 36 40] It is also important to note that we compared the digital PE to a robust face-to-face education provided by experienced rheumatology nurses, tailored to individual patient needs and rooted in established professional relationship and clinical practices. Considering this, it might have been more appropriate to design our trial as a non-inferiority study rather than aiming for superiority.[41]

Understanding the disease, its fluctuations, and treatment is important for self-management.[36] In our study both groups showed minor improvements over time, ranging from around 0.50 points to 0.75 points. A prior RCT evaluating a multimedia PE tool in RA established a minimum clinically important difference for PKQ as 0.50,[9] aligning with our findings of noteworthy changes within both groups. Another study on online education for ankylosing spondylitis reported higher knowledge scores in the intervention group compared to the control group, although both groups had within-groups improvements.[40] In contrast, a study on RA-patients using a web-based intervention featuring social support and gamification did not show knowledge changes in either groups.[8]

Health literacy is pivotal for accessing, understanding, and applying information and interacting with healthcare providers to promote health and well-being.[23 42] Like the knowledge scores, health literacy improved in both groups, with no between-group differences. Notably, high initial scores suggest a highly skilled sample aligning with similar findings of a telehealth study involving Danish patients with RA where patients in remote care were more likely to be employed, had higher incomes, less comorbidity and expressed confidence in remote care.[43] However, a different study highlighted disparities in health literacy in patients with rheumatic diseases, emphasizing the need for inclusive interventions and considering diverse health literacy competence levels in future studies.[44]

Our findings showed no group differences in terms of adherence, although the unadjusted analyses gave an impression of the control group tending to adhere more, it is likely a spurious finding as this was not supported in both analyses that adjusted for confounders and there were no specific reasons for a potential difference. However, adherence challenges are common in rheumatic diseases and can be influenced by factors like beliefs, fears, and personal experiences and should be taken into consideration when implementing digital PE.[45]

As the control group had more interactions with out-patient clinics than the intervention group, there are potentials for improving healthcare efficiency which is needed given demographic shifts

and a shortage of healthcare providers.[12] An explanation of this difference could be that the availability of the digital PE programme, with its engaging and entertaining content and easily understandable information,[46] may have contributed to this trend. However, a health-economic evaluation is necessary to provide a comprehensive evidence of cost-effectiveness of digital PE.[47]

The strengths of this study include (i) successful randomisation, ensuring group comparability (ii) inclusion of a diverse patient group in terms of age, sociodemographic backgrounds, and from five different locations in Denmark enhancing the external validity (iii) deploying a thoroughly planned, theory based intervention, which enhances outcome selection and understanding of effects[13] (iv) negligible attrition (5/180 patients), and maintaining sufficient statistical power with 97.2% of patients available for analysis (v) high questionnaire completion rates with similar percentages of missing responses between groups, i.e. missing at random.

The potential limitation of this study is self-selection bias. This study was likely to attract patients who are open to technology and invested in their health. This is evidenced by a high proportion of participants (41%) with a long education. This self-selected group with strong baseline self-efficacy, knowledge, and health literacy may have contributed to the observed modest improvements in outcomes. Demonstrate substantial changes is challenging when starting from high baseline scores. Consequently, the generalisability of these findings to the broader population of patients with RA, especially those with lower health literacy and digital skills, is limited.

In conclusion, this study demonstrated that the novel digital PE programme enhanced self-efficacy in patients newly diagnosed with RA. Knowledge, health literacy, quality of life and adherence saw minor changes, consistent in both groups. As self-efficacy is a key driver of effective self-management, the findings suggest that digital PE could be integrated into clinical practice to support self-management and potentially release staff resources. Further research should focus on tailoring interventions to accommodate patients with diverse backgrounds, health literacy levels and self-management skills for broader impact. Our findings hold great potential for further development of self-management interventions. We have demonstrated that digital PE provides

accessibility to the essential information and skills training. Thus, it will be of utmost importance for patients of tomorrow that we continuously enhance and refine such interventions to enable patients to self-manage their condition, while also considering the utilisation of diverse resources.

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CONFLICT OF INTEREST

All authors declare no competing interests of relevance to this study. The authors, ATH and LRK, developed the e-Learning programme[13] in collaboration with the software developer, Gyldendal eLearning. The Department of Rheumatology at Aarhus University Hospital possesses user rights for the programme but does not have permission to resell the programme.

DATA AVAILABILITY

The data underlying this article are available in the article and in its online supplementary material.

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Table 1. Baseline participant characteristics and baseline scores for primary and secondary outcomes

Characteristic	N	Total (N = 180)	N	Intervention (N = 89)	N	Control (N = 91)
Allocation to study sites, no. %						
- Site 1	62	34.4	30	33.7	32	35.1
- Site 2	46	25.6	23	25.8	23	25.3
- Site 3	35	19.4	17	19.1	18	19.8
- Site 4	27	15.0	14	15.8	13	14.3
- Site 5	10	5.6	5	5.6	5	5.5
Age, years, median (IQR)	180	59.0 (49 to 68)	89	59.0 (50 to 68)	91	59.0 (47 to 68)
Women, no. (%)	180	110 (61.1)	89	54 (60.7)	91	56 (61.5)
Civil status, **partner**, no. (%)	180	148 (82.2)	89	73 (82.0)	91	75 (82.4)
Cohabitation status, Living with other adult(s) no. (%)	180	138 (76.7)	89	67 (75.3)	91	71 (78.0)
Educational level, no. (%)	180		89		91	
- Basic education		22 (12.2)		10 (11.2)		12 (13.2)
- Short education		84 (46.7)		42 (47.2)		42 (46.1)
- Long education		74 (41.1)		37 (41.6)		37 (40.7)
Employment status, no. (%)	180		89		91	
- Working full time		74 (41.1)		38 (42.7)		36 (39.5)
- Working part time		19 (10.5)		12 (13.5)		7 (7.7)
- Retired		66 (36.7)		29 (32.6)		37 (40.7)
- Others		21 (11.7)		10 (11.2)		11 (12.1)
Clinical and laboratory characteristics						
- Rheumatoid factor positive, no. (%)	180	118 (65.6)	89	57 (64.0)	91	61 (67.0)
- Cyclic citrullinated peptide positive, no. (%)	180	121 (67.2)	89	60 (67.4)	91	61 (67.0)
- C-reactive protein (mmol/l), median (IQR)	180	10.0 (4 to 23)	89	9.3 (4 to 20)	91	21.7 (4 to 25.7)
- Swollen joints (range 0 to 28), median (IQR)	180	5 (2 to 9)	89	4 (2 to 9)	91	5 (2 to 9)
- Tender joints (range 0 to 28), median (IQR)	180	6 (3.5 to 10)	89	6 (4 to 10)		7 (3 to 10)
- DAS28 (range 0 to 9.4), mean (SD)	170	4.5 (1.3)	85	4.4 (1.3)	85	4.6 (1.2)
- CDAI (range 0 to 76), median (IQR)	169	18.5 (12.6 to 27.3)	84	17.8 (12.0 to 26.4)	85	20.0 (12.8 to 27.8)
- MDHAQ (range 0-3), median (IQR)	167	0.7 (0.3 to 1.1)	83	0.7 (0.2 to 1.1)	84	0.7 (0.3 1.1)
Medical treatment						
- Methotrexate, no. (%)	180	166 (92.2)	89	86 (96.7)	91	80 (87.9)
- Sulfasalazine, no. (%)	180	2 (1.1)	89	-	91	2 (2.2)
- Steroids (oral), no. (%)	180	9 (5.0)	89	4 (4.5)	90	5 (5.5)
RASE (range 28 to 140), mean (SD)	173	103.4 (12.5)	84	102.3 (11.4)	89	104.5 (13.4)
PKQ-RA-11 (range 0 to 11), mean (SD)	176	7.9 (1.6)	85	8.1 (1.4)	91	7.8 (1.8)
CQR5, high adherer, no. (%)	164	128 (78.1)	81	61 (75.3)	83	67 (80.7)
HLQ2 (range 1 to 4), mean (SD)	174	2.8 (0.5)	84	2.8 (0.6)	90	2.8 (0.5)
HLQ4 (range 1 to 4), mean (SD)	174	3.2 (0.4)	84	3.1 (0.5)	90	3.2 (0.4)
HLQ6 (range 1 to 5), mean (SD)	174	3.8 (0.6)	83	3.8 (0.6)	91	3.8 (0.6)
HLQ9 (range 1 to 5), mean (SD)	174	3.8 (0.5)	83	3.8 (0.5)	91	3.8 (0.6)

QoL value (range -0.757 to 1), median (IQR)	177	0.839 (0.753 to 0.919)	86	0.831 (0.705 to 0.919)	91	0.843 (0.766 to 0.912)
VAS (range 0 to 100), median (IQR)		72 (50 to 83)		70 (50 to 83)		73 (50 to 83)

Site 1, Aalborg University Hospital; Site 2, Aarhus University Hospital; Site 3, Randers Regional Hospital; Site 4, Horsens Regional Hospital; Site 5, Hjørring Regional Hospital.
Educational level, International Standard Classification (ISCED): Basic education, ISCED levels 1-2 = primary school, upper secondary education, Short education, ISCED levels 3-4 = vocational education and short-cycle higher education, Long education, ISCED levels 5-7 = medium-cycle higher education, bachelors and long-cycle higher education.
DAS28, Disease activity score; CDAI, Clinical Disease Activity Index; MDHAQ, Multidimensional health assessment questionnaire.
RASE, Rheumatoid Arthritis Self-Efficacy questionnaire; PKQ-RA-11, Patient Knowledge Questionnaire Rheumatoid Arthritis-11; CQR5, Compliance Questionnaire Rheumatology 5 item; HLQ, Health literacy Questionnaire (item 2, 4, 6, and 9); QoL value; EQ-5D-5L, EuroQoL, Quality of Life Questionnaire index value; VAS, Visual Analog Scale; SD, standard deviation; IQR, interquartile range.

Figure 1. Study flowchart

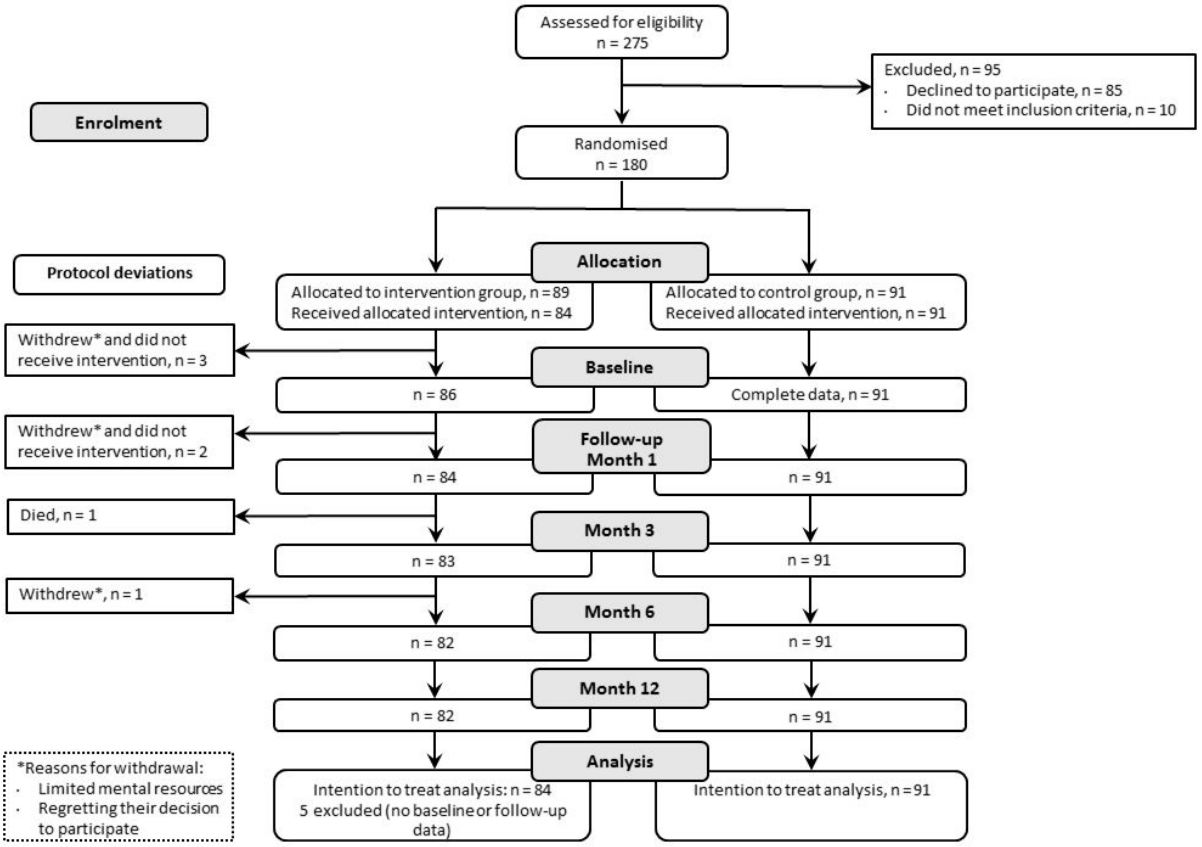


Table 2. Differences between groups in mean change from baseline to month 12 (self-efficacy, knowledge, health literacy and adherence)

Self-efficacy, patient knowledge, health literacy and adherence				
	Unadjusted results Mean difference (intervention – control)		Adjusted results§ Mean difference (intervention - control)	
	Coefficient (95% CI)	*p*-value	Coefficient (95% CI)	*p*-value
Primary outcome				
RASE	-3.65 (-7.25 to -0.05)	0.047	-4.34 (-8.17 to -0.51)	0.026
Key secondary outcomes				
PKQ-RA-11	0.09 (-0.32 to 0.51)	0.645	0.14 (-0.30 to 0.58)	0.541
HLQ2	0.07 (-0.10 to 0.24)	0.425	0.08 (-0.09 to 0.26)	0.383
HLQ4	-0.06 (-0.18 to 0.07)	0.388	-0.09 (-0.22 to 0.05)	0.203
HLQ6	-0.01 (-0.18 to 0.17)	0.965	-0.01 (-0.19 to 0.17)	0.908
HLQ9	0.08 (-0.07 to 0.22)	0.303	0.06 (-0.09 to 0.22)	0.425
	ROR (95% CI)	***p*-value**	**ROR (95% CI)**	***p*-value**
CQR5	0.69 (0.28 to 1.69)	0.416	0.72 (0.27 to 1.89)	0.501

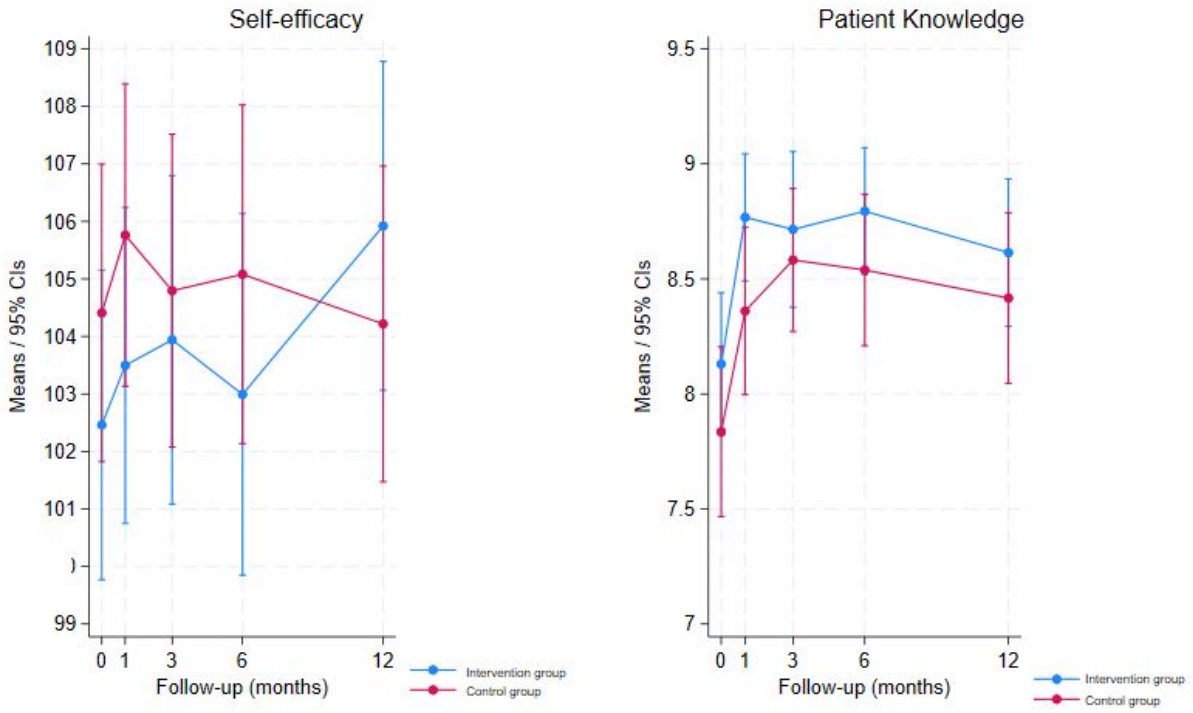
§Adjusted for the following baseline covariates; age, sex, educational level, disease activity (DAS28), and site.
RASE, Rheumatoid Arthritis self-efficacy scale; PKQ-RA-11, Patient Knowledge Questionnaire; HLQ, Health Literacy Questionnaire; HLQ2, Having sufficient information to manage my health; HLQ4, Social support for health; HLQ6, Ability to actively engage with healthcare providers; HLQ9, Understand health information well enough to know what to do; CQR5, Compliance Questionnaire Rheumatology 5-item; CI, Confidence Intervals; ROR, Relative odds ratio.

Table 3. Within group differences in self-efficacy at each time point compared to baseline (unadjusted)

	RASE	Month 1	Month 3	Month 6	Month 12
Intervention group (N=84)	**Mean difference (95% CI)**	1.03 (-1.24 to 3.31)	1.48 (-0.75 to 3.71)	0.53 (-2.76 to 3.82)	3.46 (0.86 to 6.06)
	***p*-value**	0.370	0.192	0.751	0.009
Control group (N=91)	**Mean difference (95% CI)**	1.35 (-0.82 to 3.52)	0.39 (-1.72 to 2.49)	0.67 (-2.41 to 3.75)	-0.19 (-2.69 to 2.30)
	***p*-value**	0.220	0.718	0.668	0.880

ITT, Intention to treat; RASE, Rheumatoid Arthritis self-efficacy scale; CI, Confidence interval.

Figure 2. The linear predicted means of RASE and PKQ-RA-11 from baseline to 12-month follow-up*



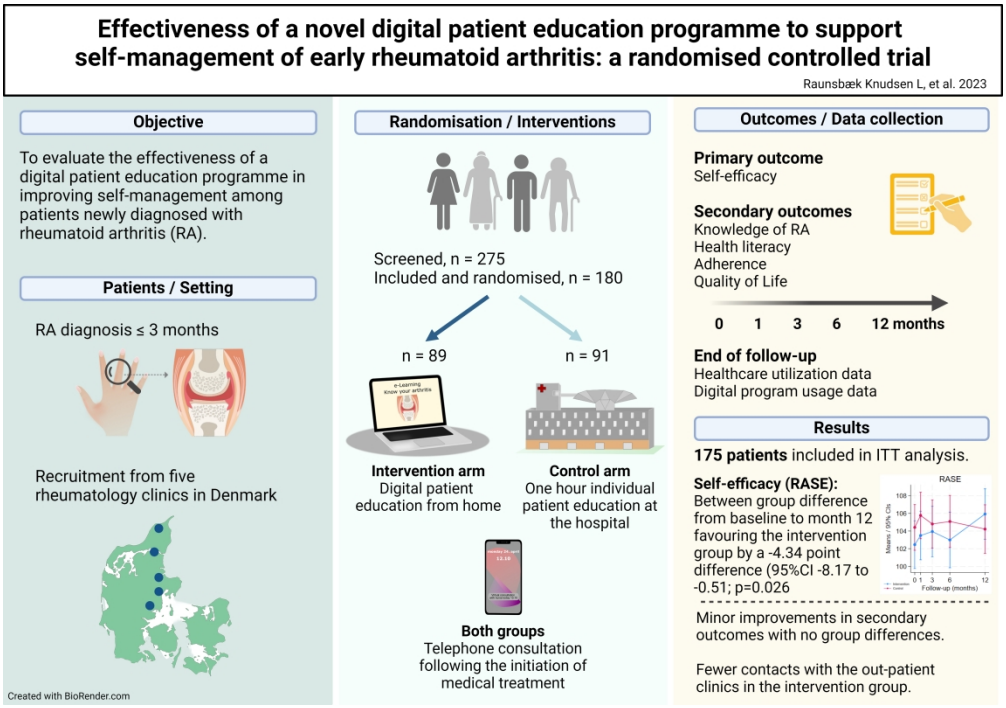
*Analysis is based on the unadjusted ITT analysis. CIs, Confidence intervals.

Table 4. Contacts with the out-patient rheumatology clinic from baseline to 12-month follow-up

	Intervention group			Control group			
	N	**Total no.**	**Average no. per patient**	**N**	**Total no.**	**Average no. per patient**	***p*-value***
Telephone contacts (nurses)	82	456	5.6	91	602	6.6	0.221
Planned visits (nurses)	82	74	0.9	91	108$^{\Delta}$	1.2	0.626
Telephone contacts (rheumatologists)	82	30	0.4	91	48	0.5	0.032
Planned visits (rheumatologists)	82	201	2.5	91	243	2.7	0.036
Acute visits (rheumatologists)	82	58	0.7	91	99	1.1	0.115

*p-value based on Wilcoxon Mann-Whitney rank-sum test.

Δ The control group initially had 199 planned visits with nurses, but to ensure comparability between groups, 91 visits were subtracted. These 91 visits represent the intervention in this group in terms of face-to-face patient education sessions in the clinics. Thus, the initial number of visits in this group was considerably higher before the subtraction.



645x452mm (236 x 236 DPI)

Consistent safety profile with over 8 years of real-world evidence, across licensed indications[1–3]

Cosentyx® secukinumab

1,000,000 patients treated globally, and counting*[4]

100+ clinical trials*[5]

8+ years of real-world evidence[1–3]

8 indications[1–3]

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Real-world evidence shows a consistent safety profile over 6 years[6,7]

No trend toward increased AE rates over time (pooled PsA, AS, PsO):†[6]

AEs of select interest (EAIR per 100 PY)	1 year	2 years	3 years	4 years	5 years	6 years	Cumulative rate
Serious infections Cases	2.0 n=149	1.7 n=475	0.7 n=649	1.3 n=1,841	1.3 n=2,285	1.1 n=2,226	1.3 n=8,719
Malignant or unspecified tumours Cases	0.2 n=15	0.2 n=50	0.2 n=225	0.3 n=422	0.3 n=520	0.3 n=573	0.3 n=1,896
MACE Cases	0.2 n=15	0.1 n=39	0.2 n=151	0.2 n=238	0.2 n=264	0.1 n=287	0.2 n=1,031
Total IBD Cases	0.2 n=12	0.2 n=46	0.2 n=185	0.3 n=340	0.2 n=312	0.1 n=261	0.2 n=1,291
Exposure (PY)	7450	28,549	93,744	137,325	182,024	212,636	680,470

No trend towards increased rates of malignancy, MACE or IBD over time[6]

The most frequently reported adverse reactions are upper respiratory tract infections (17.1%) (most frequently nasopharyngitis, rhinitis).[1,2] Refer to the prescribing information for a summary of adverse events.

Adapted from Novartis Data on File. 2021.[6]

Refer to the Cosentyx Summary of Product Characteristics for full details, dosing and administration, including special populations.

Cosentyx® (secukinumab) licensed indications in rheumatology: Cosentyx, alone or in combination with methotrexate, is indicated for the treatment of active **psoriatic arthritis** in adult patients when the response to previous disease-modifying anti-rheumatic drug therapy has been inadequate; active **ankylosing spondylitis** in adults who have responded inadequately to conventional therapy; active **non-radiographic axial spondyloarthritis** with objective signs of inflammation as indicated by elevated C-reactive protein and/or magnetic resonance imaging evidence in adults who have responded inadequately to non-steroidal anti-inflammatory drugs; active **enthesitis-related arthritis** in patients 6 years and older (alone or in combination with methotrexate) whose disease has responded inadequately to, or who cannot tolerate conventional therapy; active **juvenile psoriatic arthritis** in patients 6 years or older (alone or in combination with methotrexate) whose disease has responded inadequately to, or who cannot tolerate, conventional therapy.[1,2]

Prescribing information, adverse event reporting and full indication can be found on the next page.

*Patients prescribed Cosentyx for any indication since launch.

†Successive time periods of PSUR shown with cumulative rate: 26 Dec 2014 to 25 Dec 2015; 26 Dec 2015 to 25 Dec 2016; 26 Dec 2016 to 25 Dec 2017; 26 Dec 2017 to 25 Dec 2018: 26 Dec 2018 to 25 Dec 2019; 26 Dec 2019 to 25 Dec 2020.[6]

Abbreviations: AE, adverse event; AS, ankylosing spondylitis; EIAR, exposure-adjusted incidence rate; HCP, healthcare professional; IBD, inflammatory bowel disease; MACE, major adverse cardiac event; PsA, psoriatic arthritis; PsO, plaque psoriasis; PY, patient year.

References: 1. Cosentyx® (secukinumab) GB Summary of Product Characteristics; **2.** Cosentyx® (secukinumab) NI Summary of Product Characteristics; **3.** European Medicines Agency. European public assessment report. Available at: https://www.ema.europa.eu/en/documents/overview/cosentyx-epar-medicine-overview_en.pdf [Accessed February 2024]; **4.** Novartis Data on File. Secukinumab – Sec008. 2023; **5.** Novartis. Novartis Cosentyx® positive 16-week PREVENT results advance potential new indication for patients with axial spondyloarthritis. Available at: https://www.novartis.com/news/media-releases/novartis-cosentyx-positive-16-week-prevent-results-advance-potential-new-indication-patients-axial-spondyloarthritis [Accessed February 2024]; **6.** Novartis data on file. Cosentyx Periodic Safety Update Report (PSUR); 26 December 2019 – 25 December 2020. 22 February 2021; **7.** Deodhar A, et al. Arthritis Res Ther 2019;21(1):111.

NOVARTIS

UK | February 2024 | 407722

Cosentyx® (secukinumab) Northern Ireland Prescribing Information.

Please refer to the Summary of Product Characteristics (SmPC) before prescribing.

Indications: Treatment of: moderate to severe plaque psoriasis in adults, children and adolescents from the age of 6 years who are candidates for systemic therapy; active psoriatic arthritis in adults (alone or in combination with methotrexate) who have responded inadequately to disease-modifying anti-rheumatic drug therapy; active ankylosing spondylitis in adults who have responded inadequately to conventional therapy; active non-radiographic axial spondyloarthritis (nr-axSpA) with objective signs of inflammation as indicated by elevated C-reactive protein (CRP) and/or magnetic resonance imaging (MRI) evidence in adults who have responded inadequately to non-steroidal anti-inflammatory drugs; active enthesitis-related arthritis and juvenile psoriatic arthritis in patients 6 years and older (alone or in combination with methotrexate) whose disease has responded inadequately to, or who cannot tolerate, conventional therapy; active moderate to severe hidradenitis suppurativa (acne inversa) in adults with an inadequate response to conventional systemic HS therapy. **Presentations:** Cosentyx 150 mg solution for injection in pre-filled pen; Cosentyx 300 mg solution for injection in pre-filled pen. **Dosage & Administration:** Administered by subcutaneous injection at weeks 0, 1, 2, 3 and 4, followed by monthly maintenance dosing. Consider discontinuation if no response after 16 weeks of treatment. Each 150 mg dose is given as one injection of 150 mg. Each 300 mg dose is given as two injections of 150 mg or one injection of 300 mg. If possible avoid areas of the skin showing psoriasis. *Plaque Psoriasis:* Adult recommended dose is 300 mg monthly. Based on clinical response, a maintenance dose of 300 mg every 2 weeks may provide additional benefit for patients with a body weight of 90 kg or higher. Adolescents and children from the age of 6 years: if weight ≥ 50 kg, recommended dose is 150 mg (may be increased to 300 mg as some patients may derive additional benefit from the higher dose). If weight < 50 kg, recommended dose is 75 mg. However, 150mg solution for injection in pre-filled pen is not indicated for administration of this dose and no suitable alternative formulation is available. *Psoriatic Arthritis:* For patients with concomitant moderate to severe plaque psoriasis see adult plaque psoriasis recommendation. For patients who are anti-TNFα inadequate responders, the recommended dose is 300 mg, 150 mg in other patients. Can be increased to 300 mg based on clinical response. *Ankylosing Spondylitis:* Recommended dose 150 mg. Can be increased to 300 mg based on clinical response. *nr-axSpA:* Recommended dose 150 mg. *Enthesitis-related arthritis and juvenile psoriatic arthritis:* From the age of 6 years, if weight ≥ 50 kg, recommended dose is 150 mg. If weight < 50 kg, recommended dose is 75 mg. However, 150mg solution for injection in pre-filled pen is not indicated for administration of this dose and no suitable alternative formulation is available. *Hidradenitis suppurativa:* Recommended dose is 300 mg monthly. Based on clinical response, the maintenance dose can be increased to 300 mg every 2 weeks. **Contraindications:** Hypersensitivity to the active substance or excipients. Clinically important, active infection. **Warnings & Precautions:** *Infections:* Potential to increase risk of infections; serious infections have been observed. Caution in patients with chronic infection or history of recurrent infection. Advise patients to seek medical advice if signs/symptoms of infection occur. Monitor patients with serious infection closely and do not administer Cosentyx until the infection resolves. Non-serious mucocutaneous candida infections were more frequently reported for secukinumab than placebo in the psoriasis clinical studies. Should not be given to patients with active tuberculosis (TB). Consider anti-tuberculosis therapy before starting Cosentyx in patients with latent TB. *Inflammatory bowel disease (including Crohn's disease and ulcerative colitis):* New cases or exacerbations of inflammatory bowel disease have been reported with secukinumab. Secukinumab, is not recommended in patients with inflammatory bowel disease. If a patient develops signs and symptoms of inflammatory bowel disease or experiences an exacerbation of pre-existing inflammatory bowel disease, secukinumab should be discontinued and appropriate medical management should be initiated. *Hypersensitivity reactions:* Rare cases of anaphylactic reactions have been observed. If an anaphylactic or serious allergic reactions occur, discontinue immediately and initiate appropriate therapy. *Vaccinations:* Do not give live vaccines concurrently with Cosentyx; inactivated or non-live vaccinations may be given. Paediatric patients should receive all age appropriate immunisations before treatment with Cosentyx. *Latex-Sensitive Individuals:* The removable needle cap of the 150mg pre-filled pen contains a derivative of natural rubber latex. *Concomitant immunosuppressive therapy:* Combination with immunosuppressants, including biologics, or phototherapy has not been evaluated in psoriasis studies. Cosentyx was given concomitantly with methotrexate, sulfasalazine and/or corticosteroids in arthritis studies. Caution when considering concomitant use of other immunosuppressants. **Interactions:** Live vaccines should not be given concurrently with secukinumab. No interaction between Cosentyx and midazolam (CYP3A4 substrate) seen in adult psoriasis study. No interaction between Cosentyx and methotrexate and/or corticosteroids seen in arthritis studies. **Fertility, pregnancy and lactation:** *Women of childbearing potential:* Use an effective method of contraception during and for at least 20 weeks after treatment. *Pregnancy:* Preferably avoid use of Cosentyx in pregnancy. *Breast feeding:* It is not known if secukinumab is excreted in human breast milk. A clinical decision should be made on continuation of breast feeding during Cosentyx treatment (and up to 20 weeks after discontinuation) based on benefit of breast feeding to the child and benefit of Cosentyx therapy to the woman. *Fertility:* Effect on human fertility not evaluated. **Adverse Reactions**: *Very Common* (≥1/10): Upper respiratory tract infection. *Common* (≥1/100 to <1/10): Oral herpes, headache, rhinorrhoea, diarrhoea, nausea, fatigue. *Uncommon (≥1/1,000 to <1/100):* Oral candidiasis, lower respiratory tract infections, neutropenia, inflammatory bowel disease. *Rare (≥1/10,000 to <1/1,000):* anaphylactic reactions, exfoliative dermatitis (psoriasis patients), hypersensitivity vasculitis. *Not known:* Mucosal and cutaneous candidiasis (including oesophageal candidiasis). *Infections:* Most infections were non-serious and mild to moderate upper respiratory tract infections, e.g. nasopharyngitis, and did not necessitate treatment discontinuation. There was an increase in mucosal and cutaneous (including oesophageal) candidiasis, but cases were mild or moderate in severity, non-serious, responsive to standard treatment and did not necessitate treatment discontinuation. Serious infections occurred in a small proportion of patients (0.015 serious infections reported per patient year of follow up). *Neutropenia:* Neutropenia was more frequent with secukinumab than placebo, but most cases were mild, transient and reversible. Rare cases of neutropenia CTCAE Grade 4 were reported. *Hypersensitivity reactions*: Urticaria and rare cases of anaphylactic reactions were seen. *Immunogenicity:* Less than 1% of patients treated with Cosentyx developed antibodies to secukinumab up to 52 weeks of treatment. *Other Adverse Effects:* The list of adverse events is not exhaustive, please consult the SmPC for a detailed listing of all adverse events before prescribing. **Legal Category:** POM. **MA Number & List Price:** EU/1/14/980/005 - 150 mg pre-filled pen x2 £1,218.78; EU/1/14/980/010 – 300 mg pre-filled pen x 1 £1218.78. **PI Last Revised:** May 2023. Full prescribing information, (SmPC) is available from: Novartis Pharmaceuticals UK Limited, 2nd Floor, The WestWorks Building, White City Place, 195 Wood Lane, London, W12 7FQ. Telephone: (01276) 692255.

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Adverse Event Reporting:

Adverse events should be reported. Reporting forms and information can be found at www.mhra.gov.uk/yellowcard. Adverse events should also be reported to Novartis via uk.patientsafety@novartis.com or online through the pharmacovigilance intake (PVI) tool at www.novartis.com/report

If you have a question about the product, please contact Medical Information on 01276 698370 or by email at medinfo.uk@novartis.com

Cosentyx® (secukinumab) Great Britain Prescribing Information.

Please refer to the Summary of Product Characteristics (SmPC) before prescribing.

Indications: Treatment of: moderate to severe plaque psoriasis in adults, children and adolescents from the age of 6 years who are candidates for systemic therapy; active psoriatic arthritis in adults (alone or in combination with methotrexate) who have responded inadequately to disease-modifying anti-rheumatic drug therapy; active ankylosing spondylitis in adults who have responded inadequately to conventional therapy; active non-radiographic axial spondyloarthritis (nr-axSpA) with objective signs of inflammation as indicated by elevated C-reactive protein (CRP) and/or magnetic resonance imaging (MRI) evidence in adults who have responded inadequately to non-steroidal anti-inflammatory drugs; active enthesitis-related arthritis and juvenile psoriatic arthritis in patients 6 years and older (alone or in combination with methotrexate) whose disease has responded inadequately to, or who cannot tolerate, conventional therapy; active moderate to severe hidradenitis suppurativa (acne inversa) in adults with an inadequate response to conventional systemic HS therapy. **Presentations:** Cosentyx 75 mg solution for injection in pre-filled syringe; Cosentyx 150 mg solution for injection in pre-filled syringe; Cosentyx 150 mg solution for injection in pre-filled pen; Cosentyx 300 mg solution for injection in pre-filled pen. **Dosage & Administration:** Administered by subcutaneous injection at weeks 0, 1, 2, 3 and 4, followed by monthly maintenance dosing. Consider discontinuation if no response after 16 weeks of treatment. Each 75 mg dose is given as one injection of 75 mg. Each 150 mg dose is given as one injection of 150 mg. Each 300 mg dose is given as two injections of 150 mg or one injection of 300 mg. If possible avoid areas of the skin showing psoriasis. *Plaque Psoriasis:* Adult recommended dose is 300 mg. Based on clinical response, a maintenance dose of 300 mg every 2 weeks may provide additional benefit for patients with a body weight of 90 kg or higher. Adolescents and children from the age of 6 years: if weight ≥ 50 kg, recommended dose is 150 mg (may be increased to 300 mg as some patients may derive additional benefit from the higher dose). If weight < 50 kg, recommended dose is 75 mg. *Psoriatic Arthritis:* For patients with concomitant moderate to severe plaque psoriasis see adult plaque psoriasis recommendation. For patients who are anti-TNFα inadequate responders, the recommended dose is 300 mg, 150 mg in other patients. Can be increased to 300 mg based on clinical response. *Ankylosing Spondylitis:* Recommended dose 150 mg. Can be increased to 300 mg based on clinical response. *nr-axSpA:* Recommended dose 150 mg. *Enthesitis-related arthritis and juvenile psoriatic arthritis:* From the age of 6 years, if weight ≥ 50 kg, recommended dose is 150 mg. If weight < 50 kg, recommended dose is 75 mg. *Hidradenitis suppurativa:* Recommended dose is 300 mg monthly. Based on clinical response, the maintenance dose can be increased to 300 mg every 2 weeks. **Contraindications:** Hypersensitivity to the active substance or excipients. Clinically important, active infection. **Warnings & Precautions:** *Infections:* Potential to increase risk of infections; serious infections have been observed. Caution in patients with chronic infection or history of recurrent infection. Advise patients to seek medical advice if signs/symptoms of infection occur. Monitor patients with serious infection closely and do not administer Cosentyx until the infection resolves. Non-serious mucocutaneous candida infections were more frequently reported for secukinumab in the psoriasis clinical studies. Should not be given to patients with active tuberculosis (TB). Consider anti-tuberculosis therapy before starting Cosentyx in patients with latent TB. *Inflammatory bowel disease (including Crohn's disease and ulcerative colitis):* New cases or exacerbations of inflammatory bowel disease have been reported with secukinumab. Secukinumab, is not recommended in patients with inflammatory bowel disease. If a patient develops signs and symptoms of inflammatory bowel disease or experiences an exacerbation of pre-existing inflammatory bowel disease, secukinumab should be discontinued and appropriate medical management should be initiated. *Hypersensitivity reactions:* Rare cases of anaphylactic reactions have been observed. If an anaphylactic or serious allergic reactions occur, discontinue immediately and initiate appropriate therapy. *Vaccinations:* Do not give live vaccines concurrently with Cosentyx; inactivated or non-live vaccinations may be given. Paediatric patients should receive all age appropriate immunisations before treatment with Cosentyx. *Latex-Sensitive Individuals:* The removable needle cap of the 75mg and 150 mg pre-filled syringe and 150mg pre-filled pen contains a derivative of natural rubber latex. *Concomitant immunosuppressive therapy:* Combination with immunosuppressants, including biologics, or phototherapy has not been evaluated in psoriasis studies. Cosentyx was given concomitantly with methotrexate, sulfasalazine and/or corticosteroids in arthritis studies. Caution when considering concomitant use of other immunosuppressants. **Interactions:** Live vaccines should not be given concurrently with secukinumab. No interaction between Cosentyx and midazolam (CYP3A4 substrate) seen in adult psoriasis study. No interaction between Cosentyx and methotrexate and/or corticosteroids seen in arthritis studies. **Fertility, pregnancy and lactation:** *Women of childbearing potential:* Use an effective method of contraception during and for at least 20 weeks after treatment. *Pregnancy:* Preferably avoid use of Cosentyx in pregnancy. *Breast feeding:* It is not known if secukinumab is excreted in human breast milk. 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Rare cases of neutropenia CTCAE Grade 4 were reported. *Hypersensitivity reactions*: Urticaria and rare cases of anaphylactic reactions were seen. *Immunogenicity:* Less than 1% of patients treated with Cosentyx developed antibodies to secukinumab up to 52 weeks of treatment. *Other Adverse Effects:* The list of adverse events is not exhaustive, please consult the SmPC for a detailed listing of all adverse events before prescribing. **Legal Category:** POM. **MA Number & List Price:** PLGB 00101/1205 – 75 mg pre-filled syringe x 1 - £304.70; PLGB 00101/1029 - 150 mg pre-filled pen x2 £1,218.78; PLGB 00101/1030 - 150 mg pre-filled syringe x2 £1,218.78; PLGB 00101/1198 – 300 mg pre-filled pen x 1 £1218.78. **PI Last Revised:** June 2023. Full prescribing information, (SmPC) is available from: Novartis Pharmaceuticals UK Limited, 2nd Floor, The WestWorks Building, White City Place, 195 Wood Lane, London, W12 7FQ. Telephone: (01276) 692255.

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If you have a question about the product, please contact Medical Information on 01276 698370 or by email at medinfo.uk@novartis.com