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POSITION STATEMENT

# Statins and psoriasis: Position statement by the Psoriasis Task Force of the European Academy of Dermatology and Venerology

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[Correction added on 14-July-2023 after first online publication: "European Society of Dermatology and Venerology" has been changed to "European Academy of Dermatology and Venerology" in the title.]

**Abstract**

**Background:** Psoriasis is associated with an increased mortality risk, with cardiovascular disease being the leading excess cause (in a dose–response manner with psoriasis severity). Statins have demonstrated a reduction in all-cause mortality with no excess of adverse events among the general population. The underuse of interventions in cardiovascular prevention, such as statins, for patients with psoriasis may be the result of an insufficient evaluation.

**Objectives:** To provide the dermatologist with a tool for systematizing the treatment of dyslipidemia in psoriasis, which generally escapes the scope of dermatological practice, and to facilitate decision-making about the referral and treatment of patients.

**Methods:** The Psoriasis Task Force of the European Academy of Dermatology and Venereology performed this two-phase study to achieve a consensus and create recommendations on the use of statin therapy in patients with psoriasis. The first phase included a systematic review to identify a list of outline concepts and recommendations according to guidelines. The second phase consisted in a two-round Delphi study to evaluate those recommendations not literally taken from guidelines.

**Results:** A list of 47 concepts and recommendations to be followed by dermatologists involved in the treatment of patients with moderate–severe psoriasis was created. It included six main concepts about cardiovascular risk and psoriasis, six items related with the role of low-density lipoprotein cholesterol (LDL-c) and the benefits of statin treatment in psoriasis patients, eight recommendations about how cardiovascular risk should be assessed, three on the role of non-invasive cardiovascular imaging, three on LDL-c thresholds, eight key points related to statin prescription, 10 on statin treatment follow-up and three on patient referral to another specialist.

**Conclusions:** The application of this position statement (close final list of concepts and recommendations) will help dermatologists to manage dyslipidemia and help psoriasis patients to reduce their cardiovascular risk.

## INTRODUCTION

Psoriasis is associated with accelerated atherosclerosis and increased risk of cardiovascular (CV) complications. This association is not fully explained by traditional cardiovascular risk factors such as smoking, hypertension and elevated serum cholesterol levels, and immune dysfunction is believed to contribute to CV risk in psoriasis.[1] The traditional risk scales used to estimate CV risk have great limitations, since they were not developed specifically for psoriasis and tend to underestimate the risk.[2] Therefore, increasing awareness of the link between psoriasis and CV diseases (CVDs) represents an educational opportunity and provides a preventive medicine strategy to improve overall health and QoL of patients with psoriasis.

The underuse of interventions in CV prevention, such as statins, for patients with psoriasis may be the result of this

deficient evaluation. Interestingly, only 24% of psoriasis patients eligible for a statin for primary prevention were taking them.[3] This is relevant since lipid-lowering treatment with statins significantly and safely reduced the risk of major vascular events in people with 5-year risk of such an event lower than 10% (and, separately, in those at 5-year risk <5%), and in these people each 1.0 mmol/L reduction in LDL cholesterol produces 11 fewer major vascular events per 1000 treated over 5 years, a benefit that greatly exceeds any known hazards of statin therapy.[4] Statins have a similar effect on lipid reduction and primary prevention of CV events in patients with psoriasis compared to patients without psoriasis.[5] Furthermore, a meta-analysis of randomized controlled studies concluded that oral statins may improve psoriasis, particularly in patients with severe disease.[6] Therefore, particular attention should be paid to the treatment of conventional CV risk factors, including dyslipidemia, in these patients.

Guidelines now incorporate CV risk enhancers—including pro-inflammatory conditions, such as psoriasis—when calculating the 10-year risk of a CV event to guide prevention strategies.[7] However, there is no definite indication to use lipid-lowering therapy only because of the presence of psoriasis. In patients with a history of CVD, the indication of statins is clearer. However, the use of such drugs for primary prevention in patients with psoriasis is more controversial and needs to be elucidated.

Several strategies have been proposed for management of the CV risk in patients with psoriasis. One strategy, according to 2019 AAD/NPF guidelines,[8] is to multiply the CV risk score by 1.5 and follow the recommendations for statin therapy of the general population. Another strategy, according to the 2019 ACC/AHA guidelines[7] and the 2019 ESC guidelines,[9] is to use psoriasis as a CV risk enhancer. Unfortunately the ACC/AHA and ESC guidelines cannot be applied without assessing lipid levels, and lipid screening is woefully underperformed in patients with psoriasis.[10–12] Taking into account these considerations, the objective of our work is to provide the dermatologist with a tool for systematizing the treatment of dyslipidemia in psoriasis patients, which generally escapes the scope of dermatological practice, and to facilitate decision-making about the referral and treatment of these patients.

## METHODS

During 2021 and 2022, a study was carried out by the Psoriasis Task Force of the European Academy of Dermatology and Venereology (EADV) to achieve consensus and create recommendations on the use of statin therapy in patients with psoriasis. A steering committee consisting of four dermatologists (A.G.C., L.P., J.L. and W.H.B.) and two cardiologists (J.L.Z. and J.D.S) with extensive experience in the treatment of moderate-to-severe psoriasis and dyslipidemia respectively was created.

Methodologic support was provided by the Technical Team from the Research Support Unit of the Francisco de Vitoria University Faculty of Medicine and the Documentation Center of Hospital Ramón y Cajal.

### Study phases and literature review

As it is shown in Figure 1, this research was divided in two parts, a systematic review of the literature and a modified Delphi to generate consensus.

For the first phase of the study, a systematic review of the literature following the Cochrane recommendations[13,14] was performed to identify the concepts and recommendations that dermatologists involved in the treatment of patients with moderate to severe psoriasis should follow.

The inclusion criteria for selection of publications were:

- Clinical guidelines that describe CV risk management: screening, classification, treatment and follow up.
- Clinical guidelines on dyslipidemia management.
- Guidelines for management of psoriasis comorbidities.
- Articles describing the role of statins in the treatment of psoriasis patients and inflammatory conditions as CV risk enhancers.
- Systematic reviews on psoriasis and statins.

Bibliographic databases, namely Trip Database, Medline (Pubmed) and Cochrane Library, were searched electronically using the terms "psoriasis", "statin", "hydroxymethylglutaryl coa reductase inhibitors", "cardiovascular risk" and "dyslipidemia". The following institutional webs were consulted: European Atherosclerosis Society (EAS), European Society of Cardiology (ESC), European Academy of Dermatology and Venereology (EADV), American Heart Association (AHA), Canadian Cardiovascular Society (CCS), American College of Cardiology (ACC), American Academy of Dermatology (AAD) and the National Psoriasis Foundation (NPF). The last search was done in January 2022.

Two reviewers independently screened the titles and abstracts of the retrieved records for inclusion in the systematic review. After the screening phase, the same two reviewers independently evaluated the remaining articles to determine eligibility according to the inclusion and exclusion criteria. Disagreements among reviewers were resolved by discussion with a third senior reviewer until a final consensus was reached.

After the systematic review, the Steering Committee selected the topics to be included, which were classified according to the scientific evidence supporting them. The recommendations developed by the steering committee were mostly extracted from guidelines. For those recommendations that were not literally taken from the guidelines or could be considered subjective, a Delphi process was conducted.

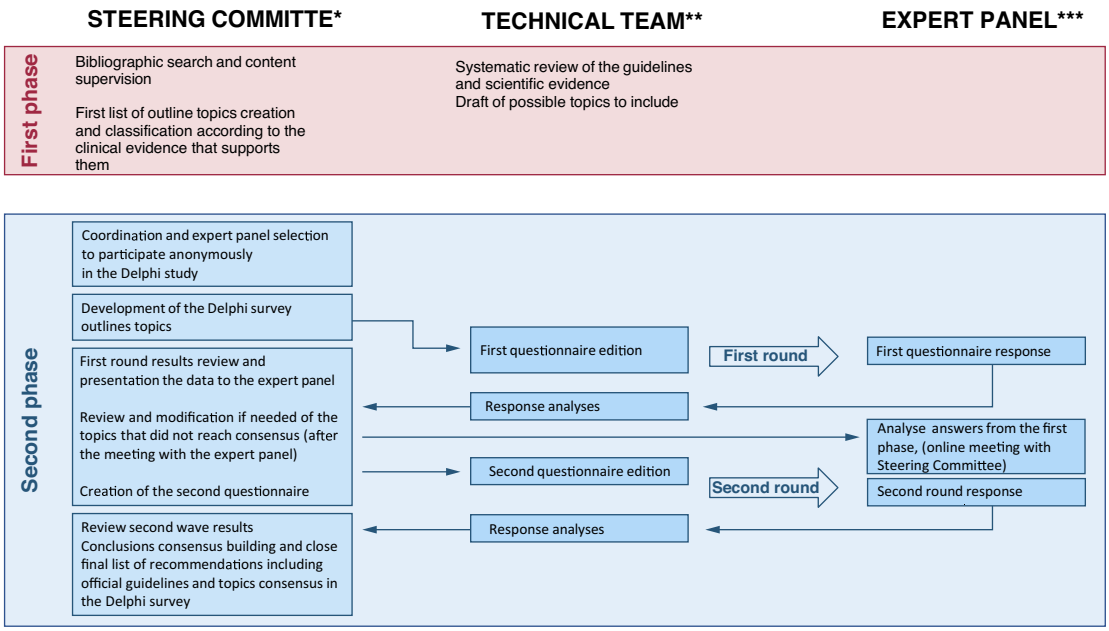


**FIGURE 1** Study design and participants.

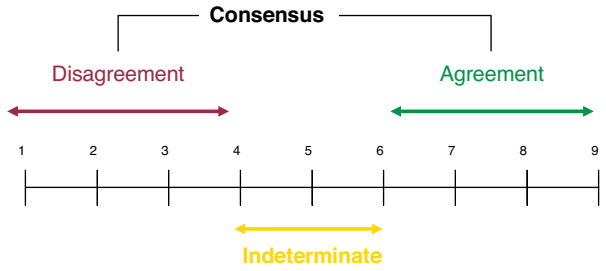


**FIGURE 2** Likert scale included in the Delphi Survey and consensus (agreement or disagreement) interpretation.

## Delphi methodology, design, and application

The Delphi method was developed to provide an effective way of exploring complex problems through structured group communication. Using this approach, it is possible to collect and synthesize opinions from a large group of experts of the study area and to achieve a degree of consensus.[15,16]

We used the modified Delphi method (a technique of professional consensus performed through written surveys) in two rounds[17] (Figure 2). All active members of The Psoriasis Task Force of the European Academy of Dermatology and Venereology were invited to participate in the survey under the supervision of the Steering Committee. A total of 24 dermatologists from various areas of Europe and with substantial experience in managing psoriasis were interested in becoming members of the Expert Panel (Appendix S1) and participated in the survey. Their responsibilities were the following: (i) participation in two rounds of an anonymous questionnaire (ii); attendance at an online group meeting to discuss the first-round results and participate in the second draft survey with the Steering Committee and (iii) attendance at a group discussion to analyse the final results of the Delphi.

To set up the survey, each questionnaire item was formulated as an assertion and assessed on a 9-point, single, ordinal, Likert-type scale: 1–3 = disagree; 4–6 = neither agree nor disagree; 7–9 = agree. Individual observations and new proposals for consideration could be added.

For the analysis and interpretation of the survey responses, the median and interquartile range of the scores were obtained using IBM SPSS Statistics Software version 26 (Armonk, NY, USA). Consensus on an item was considered to be present if more than 75% respondents voted for the majority option; if less than 25% of respondents voted outside the three-point region (1–9); and if voting dispersion was low (interquartile range ≤4). Agreement was considered to be present if the median was ≥7; disagreement if the median was ≤3; and neither agreement nor disagreement in those items with a median between 4 and 6. On the contrary, it was considered that there was no consensus when 25% or more of the panellists voted in regions 1–3 and another 25% or more in regions 7–9; and when dispersion of opinions was high (interquartile range ≥4).

The full Delphi process consisted of two rounds. The results of the first round were presented and discussed with the expert panel, obtaining their feedback in an online meeting. After this meeting, the answers were analysed and re-evaluated/modified by the Steering Committee to improve the understandability of the items. If consistent agreement or disagreement was achieved on specific items, no more voting took place. After the second round, a final list of items was obtained.

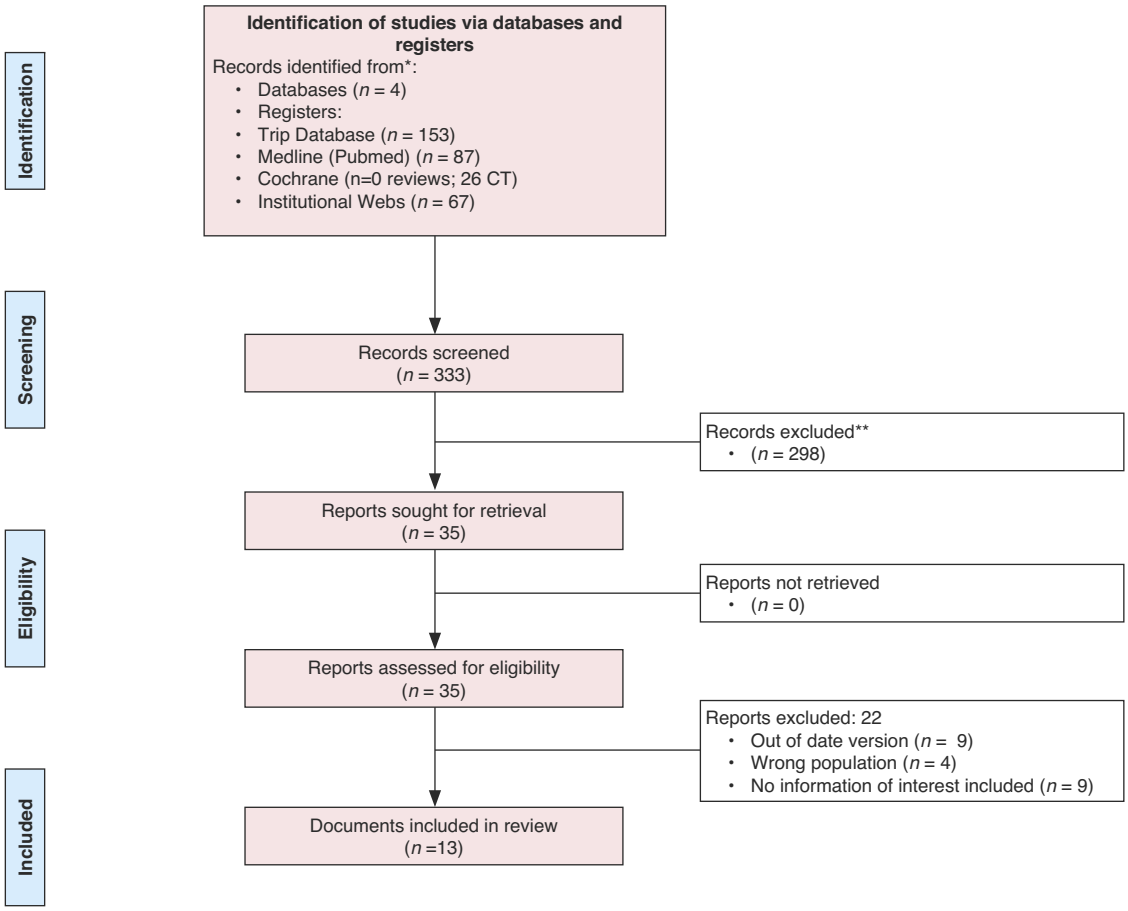


**FIGURE 3** Systematic research results flow diagram (CT: Clinical Trials).

## RESULTS

The search strategy allowed the Steering Committee to identify 49 initial recommendations from 13 publications, most of them clinical guidelines of international societies[6–9,18–26] (Figure 3). Recommendations were divided into 8 sections: (A) CV risk and psoriasis, (B) Role of LDL-c and benefits of statins, (C) CV risk screening, (D) Non-invasive CV imaging, (E) LDL-c thresholds, (F) Treatment with statins, (G) Referral to other specialists, and (H) Follow up.

After evaluation by the Steering Committee, items in the list of recommendations were reduced in number from 49 to 47: 6 in Section A, 6 in B, 3 in C, 8 in D, 3 in E, 8 in F, 3 in G and 10 in H. And, they also decided to submit for consensus the eight recommendations from Section C. Screening CV risk screening in psoriasis patients were submitted for the Delphi consensus.

The Delphi study was conducted in two rounds. All the members of the Expert Panel from the EADV (24 dermatologists) who accepted the invitation to participate were involved. In the first round, five recommendations obtained agreement. By contrast, items C.2, C.3 and C.4 did not reach enough agreement. The results of the first round were presented to the Steering Committee and the Expert Panel. After discussion, the wording of two items was modified. A new Delphi round was held (All the Delphi results are summarized in Appendix S2).

The final list of topics "Concepts and Recommendations to be taken by the dermatologist involved in the treatment of psoriasis patients" that reached consensus is shown in Tables 1 and 2; Figure 4.

## DISCUSSION

Statins are the drug of first choice in patients at increased risk of CVD.[9] In this consensus statement, we aimed to provide dermatologists with a simple tool for systematizing early detection and treatment of dyslipidemia in psoriasis. For that purpose, we brought together a heterogeneous group of dermatologists from the Psoriasis Task Force of the EADV and cardiologists, with broad experience in psoriasis and dyslipidemia, respectively. These professionals were considered to be able to provide experience-based recommendations on the issues covered in this article. The goal of this position statement is to facilitate decision making of

**TABLE 1** Lipid management in Psoriasis. Final list of concepts and recommendations.

**A. CV risk and psoriasis:**

A.1. Psoriasis is a chronic inflammatory skin disease associated with increased cardiovascular morbidity and mortality. Life expectancy in psoriasis patients is reduced by 4–5 years due to cardiovascular disease (CVD), there is an increased risk of myocardial infarction at a younger age and cardiovascular disease is the leading cause of excess deaths in these patients.[8,18]
A.2. The major risk factors for atherosclerotic cardiovascular diseases (ASCVD) are cholesterol, blood pressure, cigarette smoking, diabetes mellitus and adiposity.[19]
A.3. It seems prudent to at least consider CVD risk assessment in patients with psoriasis, and to take this condition into account when there is doubt regarding initiation of preventive interventions. The cumulative disease burden and recent degree of inflammation are important determinants of the risk-enhancing effect of psoriasis.[8,18]
A.4. According to guidelines, it has been suggested that a multiplier of risk factor (1.5) (for patients with either 10% body surface area involvement or those who are candidates for systemic or phototherapy) or an upgrade in risk category should be considered when estimating ACVSD in patients with psoriasis. Psoriasis is a risk modifier and should be consider when estimating total ACVSD.[8,18]
A.5. CVD risk in psoriasis should be treated with similar interventions as in the general high-risk or very high-risk population, as there is evidence that traditional methods to lessen risk (e.g. lipid-lowering treatment) are just as beneficial in preventing (ASCVD).[18]
A.6. In patients with psoriasis dyslipidemia is underdiagnosed and undertreated.[20]

**B. Role of LDL-C and benefits of statins**

B.1. The key initiating event in atherogenesis is the accumulation of low-density lipoprotein (LDL) cholesterol (LDL-C) and other cholesterol-rich apolipoprotein (Apo) B containing lipoproteins within the arterial wall.[9]
B.2. Reduction of LDL-C levels is the major effect of statins.[9]
B.3. Statin treatment has other potential effects; the pleiotropic effects of statins include anti-inflammatory and antioxidant effects that can have a potential role in the cardiovascular disease prevention, although their clinical relevance remains to be proven.[9]
B.4. Statins reduce all-cause mortality, with no excess of adverse events, among people without evidence of cardiovascular events.[9]
B.5. Statins have a similar effect on lipid reduction and primary prevention of CV events in patients with psoriasis compared to patients without psoriasis.[6]
B.6 Statins may improve psoriasis, particularly in patients with severe disease.[6]

**C. CV Risk screening**

C.1. In order to correctly treat patients with very high CVR, and given that patients with psoriasis patients experience their first cardiovascular event at younger ages than patients without psoriasis, a proactive approach to screening for CV risk is critical.[18]
C.2. Dermatologist should promote an adequate management of dyslipidemia in patients with psoriasis according to the European Society of Cardiology recommendations.[8]
C.3. A baseline assessment of lipids levels should be performed in patients with psoriasis and repeated according to national guidelines. A more frequent assessment of lipids should be carried out in patients with moderate to severe psoriasis.[8]
C.4. Total risk estimation using a risk estimation system such us SCORE 2 is recommended for asymptomatic adults with psoriasis without evidence of cardiovascular disease, diabetes mellitus, chronic kidney disease, familial hypercholesterolaemia or LDL > 190 mg/dL.[19]
C.5. Dermatologists should inform patients regarding the association between cardiovascular disease and psoriasis.[8]
C.6. Measures such as lifestyle counselling (diet, smoking cessation and exercises) are very important for psoriasis patients.[18]
C.7. Body Mass Index, blood pressure, cholesterol levels (LDL-C) and haemoglobin A1c should be assessed periodically in psoriasis patients.[8]
C.8. There should be focus on education of patients and health care providers about CV risk and lipid management in psoriasis.[8]

**D. Non-invasive CV imaging:**

D.1. Assessment of arterial (carotid and/or femoral) plaque burden on arterial ultrasonography may be considered as a risk modifier in individuals with psoriasis at low or moderate risk.[9,22]
D.2. Coronary artery calcium (CAC) scoring assessment with CT may be considered as a risk modifier in the CV risk assessment of asymptomatic individuals with psoriasis at low or moderate risk.[9,23]
D.3. Routine collection of other vascular tests or imaging methods (other than CAC scoring or ultrasound for plaque determination) is not recommended.[22,23]

**E. LDL-c thresholds (for cardiovascular risk levels see Figure 3)**

E.1. LDL-c levels in psoriasis patients with low-moderate cardiovascular risk should be lower than 100 mg/dL (2.6 mmoL/L).[19]
E.2. LDL-c levels in psoriasis patients with high cardiovascular risk should be lower than 70 mg/dL (1.8 mmoL/L) and a ≥50% reduction of LDL-C vs. baseline.[19]
E.3. LDL-c levels in psoriasis patients with very high cardiovascular risk should be lower than 55 mg/dL (1.4 mmoL/L) and a ≥ 50% reduction of LDL-C vs. baseline.[19]

**F. Treatment with statins:**

F.1. High-intensity treatment with statins should be prescribed when the treatment aim is at least a 50% LDL-C reduction. (Atorvastatin 40–80 mg daily; rosuvastatin 20–40 mg daily).[9,21,24]
F.2. Moderate-intensity treatment with statins should be prescribed when the treatment goal is a 30% to 49% LDL-C reduction. (atorvastatin 10–20 mg daily; fluvastatin 80 mg daily; lovastatin 40–80 mg; pitavastatin 1–4 mg; pravastatin 40–80 mg; rosuvastatin 5–10 mg; simvastatin 20–40 mg).[7,9,21,24]
F.3. It is recommended that high-intensity statin treatment is prescribed up to the highest tolerated dose to reach the specific level risk.[9]
F.4. The optimal form of statin regimen in psoriasis is unknown, but statins with profound anti-inflammatory effects (e.g., atorvastatin or rosuvastatin) may be particularly beneficial.[7,9,21]
F.5. In patients aged 20 to 75 with severe hypercholesterolemia (LDL-C ≥ 190 mg/dL): initiate high intensity statin therapy immediately, irrespective of 10-year risk of atherosclerotic cardiovascular disease (ASCVD).[7,21]
F.6. In psoriasis patients with diabetes, moderate/high-intensity statin therapy initiation is recommended to achieve the specific LDL target on each risk category.[9,21]
F.7. In psoriasis patients with subclinical atherosclerosis (coronary CT or carotid/femoral arterial ultrasound), moderate/high-intensity statin therapy initiation is recommended.[9]
F.8. If the goals are not achieved with the maximum tolerated dose of a statin, combination with ezetimibe is recommended.[7,9,21]

**G. Referral to other specialists**

G1. Patients with very high CV risk must be evaluated by the cardiologist or primary care physicians to confirm diagnostic and receive a treatment plan.[19,25]
G2. Patients with other specific comorbidities such as diabetes mellitus, chronic kidney disease, familial hypercholesterolaemia or evidence of cardiovascular disease (clinical or unequivocal on imaging) must be referred to and treated by primary care physicians or a specific specialist (endocrinologist, nephrologist, cardiologist…).[19,25]
G3. The use of lipid lowering drugs only on the basis of the presence of psoriasis diseases is not recommended.[26]

*Note*: SCORE2 or SCORE2-OP, can be found at the ESC CVD Risk Calculator app (https://www.escardio.org/Education/ESC-Prevention-of-CVD-Programme/Risk-assessment/esc-cvd-risk-calculation-app).

health care professionals in their daily practice; nevertheless, the final decision concerning an individual must be made in consultation with the patient.

Dyslipidemia, defined as either elevated low-density lipoprotein (LDL) cholesterol or triglycerides or low high-density lipoprotein (HDL) cholesterol serum levels,[27,28] is a driver of multiple systemic comorbid diseases ranging from stroke and heart attack to fatty liver disease, and is highly prevalent in psoriasis patients.[29,30] The potential benefits of statin therapy in patients with psoriasis expand beyond lipid management, since these drugs have demonstrated a reduction in all-cause mortality with no excess of adverse events among the general population in primary prevention.[31] This is relevant since it is known that psoriasis patients have an increased risk of mortality, so much so that it has been proposed that mortality should be determined as a clinically most meaningful endpoint in patients with psoriasis.[30] A recent meta-analysis found that statin was associated with lower risks of mortality and CV events in patients with immune mediated inflammatory diseases (IMIDs). The favourable effect of statin treatment on mortality seemed to be more prominent in patients with IMIDs receiving statin for primary prevention, and the magnitude of the estimate was greater than in the general population.[5] Therefore, the use of statins, especially with the purpose of primary prevention, may contribute to substantially decrease all-cause mortality and avoid some adverse cardiovascular outcomes in patients with psoriasis. These results could be largely ascribed to pleiotropic anti-inflammatory and immunomodulatory effects of statin. In fact, a recent meta-analysis of randomized

**TABLE 2** (H. Follow Up): Summary of recommendations for monitoring lipids and enzymes in patients, before and on lipid-lowering therapy (adapted from 2019 ESC/EAS Guidelines for the management of dyslipidaemias: lipid modification to reduce cardiovascular risk).[9]

| |
|---|
| H.1. Blood lipid measurements should be done 4–12 weeks after therapy is started for assessing treatment adherence and percentage of response after initiating or changing the dose of statins and recommending lifestyle changes. |
| H.2. Statin treatment follow-up requires blood lipid measurements every 3–12 months depending on the patients' needs. |
| H.3. Serum levels of alanine leucine transpeptidase (ALT) should be measured before treatment and 8–12 weeks after starting statins treatment or after a dose increase. |
| H.5. If ALT becomes elevated <3 × ULN (upper limit of normal), therapy should continue, and liver enzymes should be re-check in 4–6 weeks. |
| H.6. If ALT becomes elevated >3 × ULN, therapy should be STOP and liver enzymes should be re-check in 4–6 weeks. |
| H.7. STOP treatment if serum levels of creatin kinase (CK) become elevated >10 × ULN treatment and renal and monitor CK every 2 weeks. |
| H.8. If CK becomes elevated <10 × ULN and the patient has no symptoms, continue statins treatment continue and monitor CK every 2–6 weeks. |
| H.9. If CK becomes elevated <10 × ULN and the patient has symptoms, STOP treatment and monitor CK. |
| H.10. If CK <4 × ULN monitor CK and muscle symptoms, considering low-dose statin, alternate day or once/twice weekly dosing treatment or combination therapy with another lipid-lowering drug. |

Abbreviations: ALT, alanine leucine transpeptidase; CK, creatine kinase; ULN, upper limit of normal.

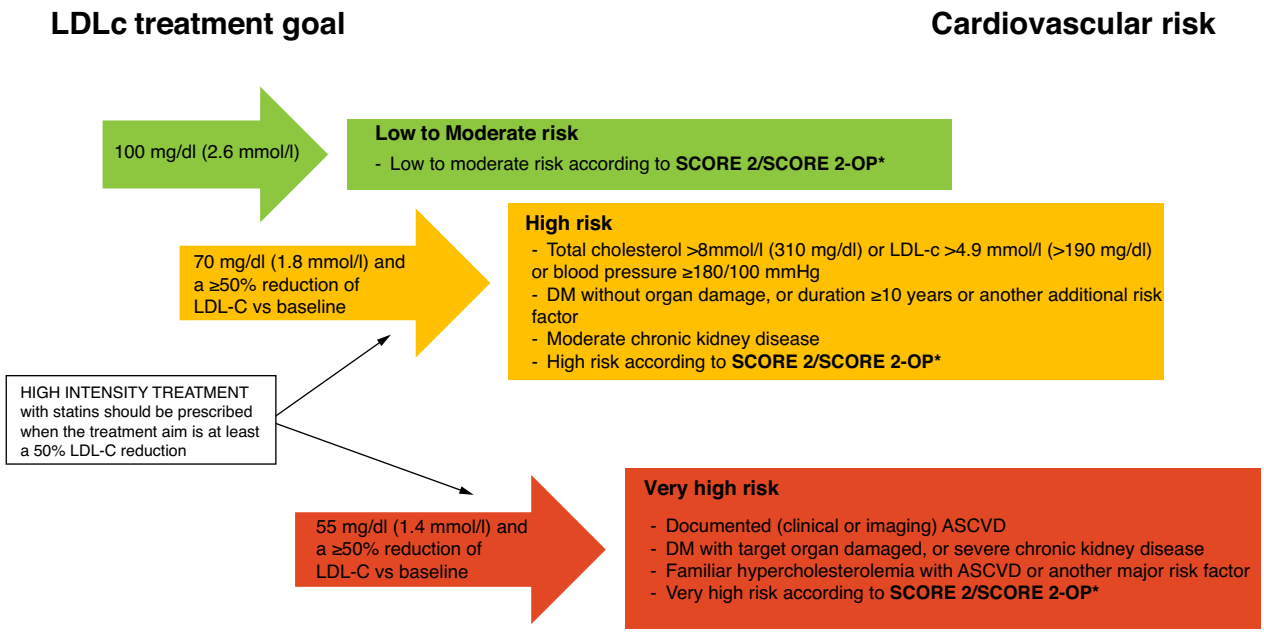


**FIGURE 4** Treatment goals for low-density lipoprotein cholesterol across categories of total CVD risk.[19]

controlled trials showed that oral statins may improve psoriasis, particularly in patients with severe disease.[6]

It is also important to consider that psoriasis patients have an increased risk of diabetes since it appears likely that statin therapy confers a small increased risk of developing diabetes.[32] Nevertheless, given the evidence from clinical trials that statins reduce cardiovascular events in patients with diabetes, both randomized trials and observational studies suggest that the beneficial effects of statins on cardiovascular events and mortality outweigh any increased risk conferred by promoting the development of diabetes.[33] However, whether statin use increases the risk of diabetes in patients with psoriasis needs to be evaluated in future studies.

In this position statement, following ESC/EAS guidelines, we recommend alanine leucine transpeptidase measurement before statin initiation and 8–12 weeks after starting treatment of after dose increase. However, in 2012, the US Food and Drug Administration (FDA) revised its labelling information on statins to only recommend liver function testing prior to initiation of statin therapy and to only repeat such testing for clinical indications.[34] Consequently, some guidelines do not routinely monitor liver function tests in patients receiving statin therapy.

Adverse events of statins include muscle-related symptoms which are relatively uncommon. In this sense, patients treated with statins should be alerted to report the new onset of myalgias or weakness. We suggest not routinely monitoring serum CK levels in patients on statin therapy.[35]

Statins are inexpensive, effective and safe, with an adverse event profile, including muscle symptoms, similar to placebo.[36] Despite the recommendation in the ESC guidelines to systematically assess the global CVD risk in individuals with any comorbidity that increases such risk, like psoriasis,[19] dyslipidemia is underscreened and undermanaged in patients with psoriasis.[20,37] Interestingly, recent findings show a willingness of dermatologists to screen for dyslipidemia and even to prescribe statins if they are educated.[38,39] This is important, since for many patients with psoriasis the dermatologist may be their only source of contact with the health care system, and each outpatient encounter provides an opportunity to improve the overall patients' health in this population with a reduced life expectancy.

Given the complexity of cardiology guidelines and the multiple health aspects that a dermatologist should take into consideration in a single visit (skin, joint, cardiometabolic condition…), in this position statement we intend to summarize the best available evidence, assisting the dermatologist in proposing the management strategy for an individual patient. This strategy may range from detecting inappropriate lipid levels—and referring the patient to the adequate physician—to taking the lead and prescribing statins when needed. A common limitation of expert consensuses, in general, is that they seek a workable compromise but do not guarantee its implementation. We tried to increase the probability of implementation in the future by focusing on practicability and reproducibility, including practical recommendations. As an example, we found relevant for the dermatologist to be aware that according to ESC guidelines, the prevention goal for LDL cholesterol in apparently healthy subjects at low risk of CVD is <100 mg/dL (2.6 mmoL/L).[9,19]

To date, most clinical trials on interventions to reduce CV risk in patients with psoriasis have focused on targeting inflammation.[40] Regarding statin therapy in psoriasis, a pilot randomized clinical trial of 30 patients with moderate psoriasis and a median LDL cholesterol level of 110 mg/dL found that atorvastatin 40 mg daily for 2 weeks significantly decreased vascular inflammation.[41] Due to the paucity of large randomized controlled trials, this position statement is largely opinion-based, founded on current guidelines for cardiovascular disease prevention and the available evidence from psoriasis and other populations and has to be validated and adjusted with developing empirical knowledge. Nevertheless, it is important to increase the knowledge and create recommendations while awaiting results from future studies. In this sense, more research on the impact of statins on psoriasis over time as well as on the impact of statins on atherosclerotic vascular disease in psoriasis are needed.

The results of Delphi exercises are limited by those who choose to participate. Although this effort was large and international, it may have suffered from a lack of representation by all relevant stakeholders, particularly community dermatologists who are not involved in academic research, and importantly, psoriasis patients. Dermatologist should also be aware that, although statin therapy are the cornerstone of CVD prevention, others cardiovascular risk factors, such as hypertension, need also to be addressed.

## ACKNOWLEDGEMENTS

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## CONFLICT OF INTEREST STATEMENT

A. González-Cantero has served as a consultant for AbbVie, Janssen, Novartis, Almirall, Celgene and LEO Pharma receiving grants/other payments, outside the submitted work. W.H. Boehncke has served as a consultant Abbvie, Almirall, Amgen, BMS, Janssen, Leo, Lilly, Novartis, Pfizer, UCB receiving grants/other payments, outside the submitted work. Dr. de Sutter has no conflict of interest to declare. J. L. Zamorano has received speaker honoraria from Bayer, Pfizer and Daichii. J Lambert has received recent grant support from AbbVie, Amgen,

Janssen, Novartis, and UCB, and has served as an advisor to/speaker for AbbVie, argenx, Almirall, Bristol-Meyers-Squibb (BMS), MS Pharma inc., Celltrion, Janssen, Novartis, and UCB. All fees are wired to an institutional scientific account, and not to personal benefit. L. Puig has perceived consultancy/speaker's honoraria from and/or participated in clinical trials sponsored by Abbvie, Almirall, Amgen, Biogen, Boehringer Ingelheim, Bristol Myers Squibb, Janssen, Leo-Pharma, Lilly, Novartis, Pfizer, Sandoz, Sanofi, and UCB.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request. The data are not publicly available due to privacy or ethical restrictions.

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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