

ANKLE SPRAINS: DIAGNOSIS AND THERAPY SYNTHESIS





Belgian Health Care Knowledge Centre

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Disclaimer: **The external experts were consulted about a (preliminary) version of the scientific report. Their comments were discussed during meetings. They did not co-author the scientific report and did not necessarily agree with its content.**

Subsequently, a (final) version was submitted to the validators. The validation of the report results from a consensus or a voting process between the validators. The validators did not co-author the scientific report and did not necessarily all three agree with its content.

Finally, this report has been approved by common assent by the Executive Board.

Only the KCE is responsible for errors or omissions that could persist. The policy recommendations are also under the full responsibility of the KCE.

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■ FOREWORD

Whoever is venturing to develop a state of the art clinical guideline, is soon or late facing surprises. This is what happened to us when we were working out this guideline on the diagnosis and treatment of ankle sprain. The first surprise was that there were hardly any good, recent guidelines on this subject: all told, we found four of them that were more recent than the year 2000. This doesn't mean that an ankle sprain is not an important matter – when all's said and done, it is a frequent trauma, accompanied by a great deal of discomfort and medical expenses.

Our second surprise was even greater – and perhaps explains the first one – regarding the lack of good scientific proof of the effectiveness of a number of *treatments* that people almost automatically advocate in daily practice, such as the combination of rest – ice – compression – elevation (RICE). Either there were a few studies, but they didn't demonstrate any effect, or there were simply no studies at all of adequate quality. Anyway, for the guideline developer the result is the same: you can't make any *evidence-based* recommendation! This undoubtedly is at odds with the clinical perception of the care-providers in the field, and it may lead some of them to reject the whole idea of *evidence-based medicine*.

That same tension between scientific proof (or the lack of it) and clinical expertise and experience of course came to the fore in the discussions with clinicians and experts during the course of the study. It brought us to formulate a number of additional recommendations, based on expert consensus. Not ideal, but probably still better than nothing; it's just that there are fewer studies available on subjects involving small commercial interests.

The good news is that for the *diagnosis* of ankle sprains clear insights from the literature *are* emerging, e.g. the finding that systematic radiography is not recommended in the absence of certain clinical signs.

With all of this in mind, we hope that this guideline can contribute towards choosing the best possible approach, which is one with less unjustified exposure to X-rays, and without immobilising people in cast when it's not really necessary.

Our last word is a word of thanks to the dozens of experts and the representatives of the physiotherapists, emergency nurses, emergency doctors, orthopaedists, podiatrists, general practitioners, professionals specialized in bandaging and radiologists who have made constructive contributions towards making this guideline a useful instrument.

Christian LÉONARD
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■ SUMMARY

INTRODUCTION

Ankle sprain is a frequent reason for encounter, both in primary care and in emergency departments.

Since 1992, the Ottawa ankle rules (OAR) are objective criteria (see below) that can assist physicians in determining whether an X-ray should be performed after an ankle injury. In practice, however, litigation risks, policies of insurance companies (e.g. work injuries or sport accidents) or patient expectations often jeopardize the possibility to avoid X-rays even when the OAR give negative results. Moreover, the performance of other diagnostic methods (such as ultrasounds or magnetic resonance imaging) is questionable.

The therapeutic modalities currently used for ankle sprain are multiple (rest, medication, ankle support, physiotherapy...) and their application varies according to the health care provider. In particular the stakeholders involved in this study raised questions on the effectiveness and preferred type of immobilisation or other ankle support after ankle trauma.

OBJECTIVE AND SCOPE OF THIS GUIDELINE

The aim of this guideline is to offer an overview of the current evidence on diagnosis and treatment of ankle sprain and to formulate recommendations to health care providers taking care of patients with ankle injuries, in primary care or emergency settings.

This guideline focuses on diagnosis and conservative treatment of **acute lateral ankle sprain** in **adults and youngsters** (16 years and over). Specific management of athletes' injuries and surgical treatments are out of scope.

METHODS

Systematic review of the literature

A search for clinical guidelines was carried out in several databases (i.e. the National Guideline Clearinghouse, NICE, SIGN, G.I.N.). The search for systematic reviews, meta-analyses and primary studies was carried out in



Medline (OVID), EMBASE, the Cochrane database of systematic reviews, PEDro, CINAHL and Medion. Two independent researchers performed the selection, the quality appraisal of the studies and the data extraction. The analysis followed a hierarchical approach:

1. Extraction of the data from the systematic reviews and meta-analyses; in the absence of high quality systematic reviews and meta-analyses, clinical guidelines of high quality were considered as a starting point.
2. Search for the most recent primary studies to complete the evidence found in the previous step (randomised and prospective controlled trials).

The search covered the period from 01/01/2000 to 06/12/2011.

Elaboration of the recommendations

On the basis of the evidence collected, the KCE researchers (PJ, DP, KH, LS) elaborated a first draft of recommendations.

To determine the level of evidence and strength of recommendation, the GRADE methodology was followed (Tables 1 & 2).

Recommendations were then submitted to a panel of clinical experts and stakeholders, including representatives of professional organisations (see colophon), who rated them with a score ranging from 1 ('completely disagree') to 5 ('completely agree') and discussed them at a meeting.

Finally, three other external validators assessed and validated this guideline by using the Agree II checklist. The validation process was chaired by CEBAM (Belgian Centre for Evidence-Based Medicine). According to a proposal by the validators of this report, recommendations based on expert consensus were labelled as "Best practice".

Declarations of interest were officially recorded.

Table 1 – Levels of evidence according to GRADE^a

Quality level	Definition	Methodological Quality of Supporting Evidence
High	We are very confident that the true effect lies close to that of the estimate of the effect	RCTs without important limitations or overwhelming evidence from observational studies
Moderate	We are moderately confident in the effect estimate: the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different	RCTs with important limitations (inconsistent results, methodological flaws, indirect, or imprecise) or exceptionally strong evidence from observational studies
Low	Our confidence in the effect estimated is limited: the true effect may be substantially different from the estimate of the effect	RCTs with important limitations or observational studies or case series
Very low	We have very little confidence in the effect estimate: the true effect is likely to be substantially different from the estimate of the effect	

Table 2 – Strength of recommendations according to GRADE^b

Grade	Definition
Strong	The desirable effects of an intervention clearly outweigh the undesirable effects (<i>the intervention is to be put into practice</i>), or the undesirable effects of an intervention clearly outweigh the desirable effects (<i>the intervention is not to be put into practice</i>).
Weak	The desirable effects of an intervention probably outweigh the undesirable effects (<i>the intervention probably is to be put into practice</i>), or the undesirable effects of an intervention probably outweigh the desirable effects (<i>the intervention probably is not to be put into practice</i>).

^a Balshem H, Helfand M, Schunemann HJ, Oxman AD, Kunz R, Brozek J, et al. GRADE guidelines: 3. Rating the quality of evidence. J Clin Epidemiol. 2011;64(4):401-6.

^b Guyatt GH, Oxman AD, Kunz R, Falck-Ytter Y, Vist GE, Liberati A, et al. Going from evidence to recommendations.[Erratum appears in BMJ. 2008 Jun 21;336(7658): doi:10.1136/bmj.a402]. BMJ. 2008;336(7652):1049-51.



CLINICAL RECOMMENDATIONS

The details of the evidence used to formulate the recommendations and best practice below are available in the scientific report and its supplements. The tables follow the sequence of the chapters of the scientific report.

Diagnosis

History taking

Best practice (expert consensus)

History taking is recommended in the initial assessment of an acute ankle sprain. It should contain at least a description of the injury mechanism, the first symptoms and their evolution, the early management of the injury, the history of previous ankle sprain and a general medical history.

Physical examination

Best practice (expert consensus)

Inspection and palpation should be a part of the initial assessment of an acute ankle sprain.

An attempt to grade the severity of the ankle sprain during the initial assessment of the sprain should be done, based on symptoms and physical examination.

A clinical re-evaluation 3 to 4 days after ankle trauma should be performed to ascertain the severity of the ankle sprain.

Ottawa Ankle Rules

Recommendation	Strength of Recommendation	Level of Evidence
The use of Ottawa Ankle Rules (see Figure 1) is recommended to exclude a fracture after acute ankle sprain.	Strong	Moderate
Training of health care providers on OAR application is recommended.	Strong	Low

Best practice (expert consensus)

The results of the OAR should be systematically recorded in each medical record.

Other clinical tests (e.g. drawer test, talar tilt test, tuning fork test) and clinical rules (as the Bernese, the Utrecht or the Leiden rules) should not be used in the assessment of an acute ankle sprain.

Figure 1. The Ottawa ankle rules



An ankle x-ray series is only required if

there is any pain in the malleolar zone and any of these findings:

1. bone tenderness at A
OR
2. bone tenderness at B
OR
3. inability to take 4 complete steps both immediately and in ED

A foot x-ray series is only required if

there is any pain in the midfoot zone and any of these findings:

1. bone tenderness at C
OR
2. bone tenderness at D
OR
3. inability to take 4 complete steps both immediately and in ED

RECOMMENDATIONS

Apply the Ottawa Ankle Rules accurately:

- palpate the entire distal 6 cm of the fibula and tibia
- do not neglect the importance of medial malleolar tenderness
- do not use for patients under age 18

Clinical judgement should prevail over the rules if the patient:

- is intoxicated or uncooperative
- has other distracting painful injuries
- has diminished sensation in the legs
- has gross swelling which prevents palpation of malleolar bone tenderness

Give written instructions and encourage follow-up in 5 to 7 days if pain and ability to walk are not better.

Stiel IG, McKnight RD, Greenberg GH, et al. Implementation of the Ottawa Ankle Rules. JAMA 1994; 271:827-832.

Reprinted with permission of the Ottawa Hospital Research Institute



Imaging

Recommendation	Strength of Recommendation	Level of Evidence
If the OAR give positive results , a radiography of good quality (3 views) is the recommended diagnostic technique for excluding a fracture in acute ankle sprain.	Strong	Moderate
If the OAR give positive results , ultrasonography performed by a physician specially trained in joint and bone ultrasonography could be considered for excluding fractures while reducing the need for radiographies. However, the experts underline the fact that the organisational constraints (e.g. waiting times, unavailability of trained radiologist) call for considering radiography as the first line diagnostic technique.	Weak	Very low
If the OAR give negative results , radiographies should not be performed in the initial assessment of an acute ankle sprain.	Strong	Moderate
Magnetic Resonance Imaging (MRI) should not be part of the initial assessment of an acute ankle sprain.	Strong	Very low
No recommendation can be formulated in relation to the use of CT scan in case of an acute ankle sprain (no evidence available).		

Best practice (expert consensus)

Patients should be systematically informed about the uselessness of X-ray after negative OAR results.



Therapy

Medication

Recommendation	Strength of Recommendation	Level of Evidence
<p>Topical non-steroidal anti-inflammatory drugs (diclofenac, ibuprofen, and piroxicam) are recommended for pain alleviation in acute ankle sprain.</p> <p>There is no sound clinical evidence to recommend the use of a plaster (adhesive dressing) that combines diclofenac and heparin in the treatment of acute ankle sprain.</p> <p>There is no sound clinical evidence to recommend the use of a comfrey root extract ointment in the treatment of acute ankle sprain.</p>	<p>Strong</p> <p>Weak</p> <p>Weak</p>	<p>Moderate</p> <p>Low</p> <p>Very low</p>
<p>Paracetamol at therapeutic doses (4 x 500 mg to 4 x 1 g/day) is recommended as an additional analgesic treatment in acute ankle sprain.</p>	<p>Strong</p>	<p>Low</p>
<p>Oral non-steroidal anti-inflammatory drugs (NSAIDs) can be considered instead of topical NSAIDs when topical NSAIDs combined with paracetamol are not effective for pain alleviation in acute ankle sprain.</p> <p>Treatment with COX-II inhibitors might be considered in patients with gastrointestinal, renal or hepatic disease.</p>	<p>Weak</p> <p>Weak</p>	<p>Low</p> <p>Low</p>
<p>Diosmin combined with hesperidin cannot be recommended in the treatment of the swelling in acute ankle sprain.</p>	<p>Weak</p>	<p>Very low</p>

Rest-Ice-Compression-Elevation (RICE)

Recommendation	Strength of Recommendation	Level of Evidence
<p>There is no sound clinical evidence to recommend the use of rest in acute ankle sprain.</p> <p>There is no sound clinical evidence to recommend the use of ice in acute ankle sprain.</p> <p>There is no sound clinical evidence to recommend the use of compression in acute ankle sprain.</p> <p>The lack of good quality studies does not allow to assess the effectiveness and to recommend elevation in acute ankle sprain.</p> <p>The lack of good quality studies does not allow to assess the effectiveness and to recommend RICE (combination of Rest, Ice, Compression and Elevation) in acute ankle sprain.</p>	<p>Weak</p>	<p>Very low</p>



Best practice (expert consensus)

Rest without weight-bearing within the first 3 days after acute ankle sprain is advised to avoid early overload and decrease pain.

Electrophysical therapy

Recommendation	Strength of Recommendation	Level of Evidence
Therapeutic ultrasound is not recommended in the treatment of acute ankle sprain.	Strong	Low
Laser therapy is not recommended in the treatment of acute ankle sprain.	Strong	Very low

Ankle support

Recommendation	Strength of Recommendation	Level of Evidence
Treatment with non-rigid (e.g. elastic bandages, tapes) or semi-rigid ankle support (e.g. braces) is preferred to immobilisation with below-knee cast for the immediate treatment of a non severe acute ankle sprain.	Strong	Low
In severe cases, i.e. where the patient is unable to bear weight after 3 days, a short period (up to 10 days) of immobilisation with a below-knee cast can be considered on a case by case basis.	Strong	Low

Best practice (expert consensus)

The use of simple non adhesive elastic bandages is not advised in the treatment of acute ankle sprain.

Exercise therapy

Recommendation	Strength of Recommendation	Level of Evidence
Early exercise therapy including proprioceptive/balance training components is recommended in the treatment of acute ankle sprains (as soon as possible). There is no sound clinical evidence to differentiate between different types of exercise intervention or to recommend a specific setting (home-based unsupervised or supervised in a clinical setting) to undergo these interventions.	Strong	Low

*Manual therapy*

Recommendation	Strength of Recommendation	Level of Evidence
Manual therapy cannot be recommended in the treatment of acute ankle sprains.	Weak	Very low

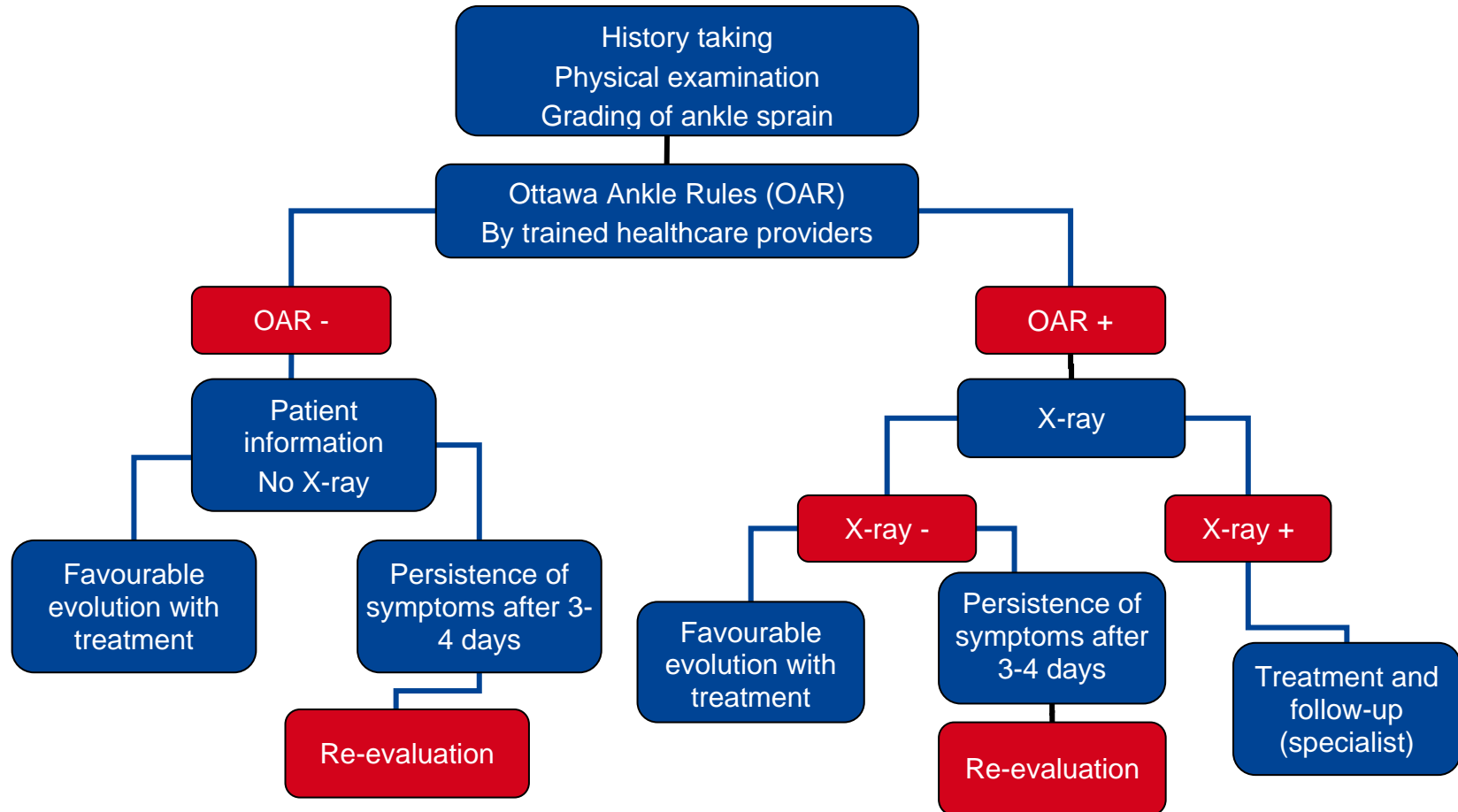
*Patients' information***Best practice (expert consensus)**

Patients should be systematically informed about the benefits and risks of each treatment and the warning symptoms in case of unfavourable evolution of an acute ankle sprain.



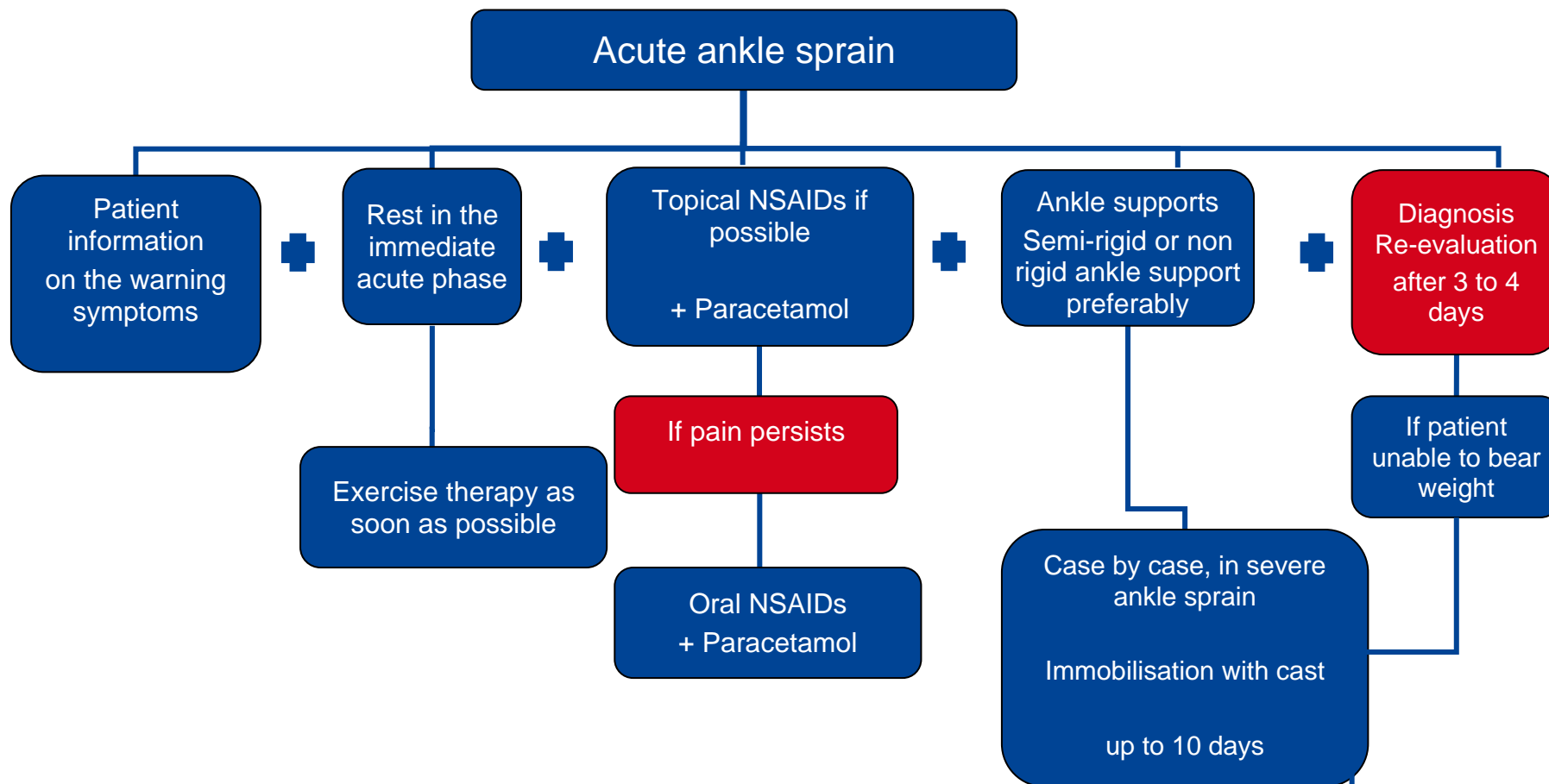
ALGORITHMS

Diagnosis





Therapy





DISCUSSION

For the **diagnosis** of ankle injuries, the main message emerging from this study is the importance of using the Ottawa ankle rules to avoid a X-ray. Concomitantly, the study also brought out the paucity of evidence for some other diagnostic techniques.

Likewise, for a number of **therapeutic** interventions, frequently performed in current daily practice, the level of evidence is also very low or absent. An illustration of this is the scarce evidence supporting the use of RICE (Rest, Ice, Compression and Elevation). However, absence of evidence of effect does not necessarily mean evidence of absence of effect. And in order to assist health care providers in their decisions, the expert panel involved in the development of this guideline proposed a number of treatment options based on consensus.

The most important message that emerges from this work is that the adherence to the proposed algorithms could spare many patients unnecessary X-rays and immobilisation with casts.

The impact of this message, however, critically depends on its dissemination by the societies of health professionals. The fact that representatives of the associations of physiotherapists, emergency nurses, emergency physicians, general practitioners, orthopedic surgeons, radiologists and podiatrists have been involved in the guideline development process will hopefully contribute to its further dissemination and implementation.



■ POLICY RECOMMENDATIONS^c

To the National Council for Quality Promotion and to scientific associations of emergency physicians, emergency nurses, general practitioners, orthopedists, physiotherapists, radiologists and podiatrists:

- This guideline should be disseminated and translated into procedures, protocols, training material, vade mecums, EBMPpracticeNet... in a user-friendly format for daily practice.
- Process and result indicators should be developed based on the recommendations from this guideline.

For further research

- There is a need for studies that consider the severity of ankle sprains in their design. In particular, studies are needed to address the definition of mild, moderate and severe ankle sprains in the diagnosis, the relation between grading and treatment as well as studies with long-term follow-up to assess the risk of recurrence as a meaningful outcome.

^c The KCE has sole responsibility for the recommendations.

