



The **Cow's Milk-related Symptom Score**  
**CoMiSS™**

*An awareness tool*

to recognize cow's milk-related symptoms  
in infants and young children



**Nestlé Health Science**

Where Nutrition Becomes Therapy

# Background

## SYMPTOMS RELATED TO INTAKE OF COW'S MILK

**Many infants present with symptoms that can be related to intake of cow's milk.**

**Cow's milk protein allergy (CMPA) however is often not considered as a diagnosis, mainly due to the lack of specific diagnostic marker.**

**There are two groups of patients:**

- 1** those with obvious CMPA
- 2** those with unclear symptoms in different organ systems

**The first group is easy to recognize:**

- consists mainly of infants with immediate/rapid reactions
- most of the time IgE mediated

However, this group represents a minority of all the infants with suspected cow's milk-related symptoms seen by primary healthcare providers.

## In many cases, parents report some or all of these symptoms:

- ➔ Infant crying, having 'colic'
- ➔ Difficult defecation or 2-3 loose stools per day
- ➔ Regurgitates 4 to 6 times a day
- ➔ Mild patches of atopic dermatitis

Due to the lack of diagnostic test for CMPA (other than the challenge test), an awareness tool to recognize cow's milk-related symptoms for use by primary healthcare providers may increase the awareness and the recognition of symptoms possibly related to cow's milk, leading to an accurate diagnosis at an earlier stage.



### SYMPTOMS OF CMPA

The majority of affected children have one or more symptom involving one or more organ system, mainly the gastrointestinal tract or the skin.<sup>1,2</sup>

The majority have at least two symptoms and symptoms in at least two organ systems.<sup>2</sup>

About 50%-70% have cutaneous symptoms, 50-60% gastrointestinal symptoms, and about 20-30% respiratory symptoms.<sup>3</sup>

1. Lifschitz C, Szajewska H. Cow's milk allergy: evidence-based diagnosis and management for the practitioner. *Eur J Pediatr.* 2015;174:141-50.
2. Høst A. Cow's milk protein allergy and intolerance in infancy. Some clinical, epidemiological and immunological aspects. *Pediatr Allergy Immunol* 1994; 5(5 Suppl): 1-36.
3. Vandenplas Y, Koletzko S, Isolauri E, Hill D, Oranje A, Brueton M, Staiano A Dupont C. Guidelines for the diagnosis and management of cow's milk protein allergy in infants. *Arch Dis Child.* 2007;92:902-8.

# WHAT IS CoMiSS™?

- The **CoMiSS™ awareness tool** should be regarded as a tool to increase awareness of the most common symptoms of CMPA, that in turn can aid an earlier accurate diagnosis.
- The CoMiSS™ should increase awareness and knowledge to minimize over- and under-diagnosis and to consider cow's milk-related symptoms.
- The CoMiSS™ is also a tool that can be used to evaluate and quantify the evolution of symptoms during a therapeutic intervention.
- Published data using the CoMiSS™ in clinical trials show that the predictive value of the tool is 80% if the score is >12 at the start and decreases to <6 within 2 weeks under an elimination diet with an extensively hydrolysed formula.

CoMiSS™ is not a diagnostic test for CMPA.  
It does not replace a food challenge  
and its usefulness will need to be evaluated  
by a prospective randomized study.

## WHO IS CoMiSS™ INTENDED FOR?

The CoMiSS™ is intended for primary healthcare providers who are all too often very limited in time and therefore need a tool that is simple, fast and easy-to-use. It can be filled in by the healthcare provider or by the parents as preparation for the doctor's visit.

# THE CoMiSS™ AWARENESS TOOL

Most patients with obvious CMPA, such as those with anaphylactic reactions or immediate IgE mediated reactions will not be picked-up by the CoMiSS™.

**However, many infants present with non-IgE mediated reactions to cow's milk protein. These infants are difficult to identify as they present with delayed reactions, often moderate to mild in severity and often in different organ systems.**

Functional GI symptoms such as regurgitation and vomiting, constipation, crying and colic are considered as non-IgE mediated reactions. Atopic eczema is often not recognized as a possible consequence of ingestion of CMP.

## Expert Consensus

**ACTA PÆDIATRICA**  
NURTURING THE CHILD

Acta Paediatrica ISSN 0803-5253

**COMMITTEE REPORT**

**A workshop report on the development of the Cow's Milk-related Symptom Score awareness tool for young children**

Yvan Vandenplas (yvan.vandenplas@uzbrussel.be)<sup>1</sup>, Christophe Dupont<sup>2</sup>, Philippe Eigenmann<sup>3</sup>, Ame Host<sup>4</sup>, Mikael Kuitunen<sup>5</sup>, Carmen Ribes-Koninck<sup>6</sup>, Neil Shah<sup>7,8</sup>, Raanan Shamir<sup>9</sup>, Annamaria Staiano<sup>10</sup>, Hania Szajewska<sup>11</sup>, Andrea Von Berg<sup>12</sup>

1.UZ Brussel, Free University of Brussels, Brussels, Belgium  
2.Pediatric Gastroenterology, Hepatology and Nutrition Department, Necker Children's Hospital, Paris, France  
3.Pediatric Allergy Unit, University Hospitals of Geneva, Geneva, Switzerland  
4.Department of Paediatrics, Hans Christian Andersen Children's Hospital, Odense University Hospital, Odense, Denmark  
5.Children's Hospital, University of Helsinki and Helsinki University Central Hospital, Helsinki, Finland  
6.Paediatric Gastroenterology and Hepatology Unit, La Fe University Hospital, Valencia, Spain  
7.Great Ormond Street Hospital for Children London (UK) and KU Leuven, Belgium, UK  
8.TARGID, Leuven, Belgium  
9.Institute of Gastroenterology, Nutrition and Liver Diseases, Schneider Children's Medical Center of Israel, Sackler Faculty of Medicine Tel-Aviv University, Tel-Aviv, Israel  
10.Department of Translational Medical Science, Section of Pediatrics, University of Naples Federico II, Naples, Italy  
11.Department of Paediatric, The Medical University of Warsaw, Warsaw, Poland  
12.Research Institute, Department of Pediatrics, Marien-Hospital, Wesel, Germany

**Keywords**  
atopic dermatitis, awareness tool, constipation, cow's milk protein allergy, regurgitation

**Correspondence**  
Y Vandenplas, UZ Brussel, Department of Paediatrics, Laarbeeklaan 101, 1090 Brussels, Belgium.  
Tel: + 3224775780 |  
Fax: +3224775783 |  
Email: yvan.vandenplas@uzbrussel.be

**Received**  
23 October 2014; revised 14 November 2014; accepted 15 December 2014.  
DOI:10.1111/apa.12902

**ABSTRACT**  
Clinicians with expertise in managing children with gastrointestinal problems and/or atopic diseases attended a workshop in Brussels in September 2014 to review the literature and determine whether a clinical score derived from symptoms associated with the ingestion of cow's milk proteins could help primary healthcare providers. The Cow's Milk-related Symptom Score (CoMiSS), which considers general manifestations, dermatological, gastrointestinal and respiratory symptoms, was developed as an awareness tool for cow's milk-related symptoms. It can also be used to evaluate and quantify the evolution of symptoms during therapeutic interventions, but does not diagnose cow's milk protein allergy and does not replace a food challenge. Its usefulness needs to be evaluated by a prospective randomised study.

**Conclusion:** The CoMiSS provides primary healthcare clinicians with a simple, fast and easy-to-use awareness tool for cow's milk-related symptoms.

## *How to use*

# THE CoMiSS™ AWARENESS TOOL IN CLINICAL PRACTICE

**CoMiSS™ quantifies the number and severity of symptoms.**

**Suspicion of 'cow's milk-related symptoms' based on the presence of a combination of the following symptoms:**

### **GENERAL DISCOMFORT**

Persistent distress or colic ( $\geq 3$  hours per day wailing/irritable) at least 3 days/week over a period of  $> 3$  weeks.

### **GASTROINTESTINAL SYMPTOMS**

Frequent regurgitation, vomiting, diarrhea, constipation (with/without perianal rash), blood in stool.

### **RESPIRATORY SYMPTOMS**

Runny nose (otitis media), chronic cough, wheezing (unrelated to infection).

### **DERMATOLOGICAL SYMPTOMS**

Atopic dermatitis, angioedema, urticaria unrelated to acute infections, drug intake manifestations.

# CoMiSS™: Cow's Milk-related Symptom Score

Last name: \_\_\_\_\_

First name: \_\_\_\_\_

Age: \_\_\_\_\_

Date: \_\_\_\_\_

## PURPOSE

The CoMiSS™ is a simple, fast and easy-to-use awareness tool for cow's milk-related symptoms. It increases awareness of the most common symptoms of cow's milk protein allergy (CMPA) that in turn can aid an earlier diagnosis. CoMiSS™ can also be used to evaluate and quantify the evolution of symptoms during a therapeutic intervention.

## INSTRUCTIONS

If there is a suspicion of cow's milk-related symptoms, rate the observed/reported symptoms by choosing the most appropriate score for each type of symptom. Once completed, add the scores together and put the total in the box at the bottom of the scoring form.

SYMPTOM	SCORE		SCORE		
<b>Crying*</b>	0	≤ 1 hour/day	SCORE <input type="text"/>		
	1	1 to 1.5 hours/day			
	2	1.5 to 2 hours/day			
	3	2 to 3 hours/day			
	4	3 to 4 hours/day			
	5	4 to 5 hours/day			
	6	≥ 5 hours/day			
<b>Regurgitation</b>	0	0 to 2 episodes/day	SCORE <input type="text"/>		
	1	≥ 3 to ≤5 of small volume			
	2	> 5 episodes of >1 coffee spoon			
	3	> 5 episodes of ± half of the feeds in <half of the feeds			
	4	Continuous regurgitations of small volumes >30 min after each feed			
	5	Regurgitation of half to complete volume of a feed in at least half of the feeds			
<b>Stools</b> (Bristol scale)	4	Type 1 and 2 (hard stools)	SCORE <input type="text"/>		
	0	Type 3 and 4 (normal stools)			
	2	Type 5 (soft stool)			
	4	Type 6 (liquid stool, if unrelated to infection)			
	6	Type 7 (watery stools)			
<b>Skin symptoms</b>	0 to 6	Atopic eczema	HEAD-NECK-TRUNK	ARMS-HANDS-LEGS-FEET	SCORE <input type="text"/>
		Absent	0	0	
		Mild	1	1	
		Moderate	2	2	
	Severe	3	3		
	0 or 6	Urticaria	NO	YES	SCORE <input type="text"/>
			0	6	
<b>Respiratory symptoms</b>	0	No respiratory symptoms	SCORE <input type="text"/>		
	1	Slight symptoms			
	2	Mild symptoms			
	3	Severe symptoms			

\* Crying only considered if the child has been crying for 1 week or more, assessed by the parents, without any other obvious cause.

TOTAL SCORE

## READING THE RESULT

The scoring ranges from 0 to 33. Each symptom has a maximal score of 6, except respiratory symptoms where the maximal score is 3.

If final score ≥ 12, the symptoms are likely cow's milk related. This could potentially be CMPA.

If final score < 12, the symptoms are less likely related to cow's milk. Look for other causes.

**CMPA diagnosis can only be confirmed by an elimination diet followed by an oral food challenge.**

Vandenplas, Y., Dupont, C., Eigenmann, P., Host, A., Kuitunen, M., Ribes-Koninck, C., Shah, N., Shamir, R., Staiano, A., Szajewska, H. and Von Berg, A. (2015), A workshop report on the development of the Cow's Milk-related Symptom Score awareness tool for young children. Acta Paediatrica. doi: 10.1111/apa.12902

Download the CoMiSS™ scoring form at: [NestleHealthScience.com/CoMiSS](https://NestleHealthScience.com/CoMiSS)

## CRYING

- The duration of crying is evaluated. The longer the crying, the higher the score.
- At least > 3 days/week for 1 week or more, assessed by the parents, without any other obvious cause.
- Crying relates to colic. Colic is defined as > 3 hours crying/day for at least 3 days during 1 week and since at least 1 week.
- Up to 3 hours of crying/day accounts for a score of 3.

### *Crying\**

#### SCORE

0	≤ 1 hour/day
1	1 to 1.5 hours/day
2	1.5 to 2 hours/day
3	2 to 3 hours/day
4	3 to 4 hours/day
5	4 to 5 hours/day
6	≥ 5 hours/day

▶ Age > 2 weeks, < 4 months

\* Should only be considered if the child has been crying for 1 week or more, assessed by the parents and without any other obvious cause.

### *Regurgitation*

#### SCORE

0	0 to 2 episodes/day
1	≥ 3 to ≤ 5 of small volume
2	> 5 episodes of >1 coffee spoon
3	> 5 episodes of ± half of the feed in < half of the feedings
4	Continuous regurgitations of small volumes > 30 min after each feed
5	Regurgitation of half to complete volume of a feed in at least half of the feeds
6	Regurgitation of the complete feed after each feeding

▶ Age > 2 weeks, < 6 months

## REGURGITATION

- Using the score for grading the regurgitation.<sup>1</sup>
- Rates the regurgitated volume and severity of the regurgitation.

1. Vandenplas Y, Hachimi-Idrissi S, Casteels A, Mahler T, Loeb H. A clinical trial with an "anti-regurgitation" formula. Eur J Pediatr. 1994;153:419-23.



# STOOLS

Using the well established Bristol stool scale to evaluate the consistency of the stools:<sup>2</sup>

- **Type 1 and 2** indicate constipation
- **Type 3 and 4** are 'ideal consistencies'
- **Type 5** soft stools
- **Type 6** tends to indicate diarrhea
- **Type 7** indicates overt diarrhea

## *Stools (Bristol scale)*

### SCORE

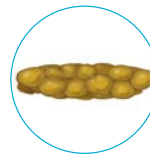
- 4 Type 1 and 2 (hard stools)
- 0 Type 3 and 4 (normal stools)
- 2 Type 5 (soft stool)
- 4 Type 6 (liquid stool, if unrelated to infection)
- 6 Type 7 (watery stools)

► For at least one week



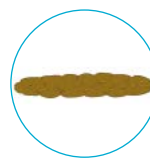
### ● Type 1

Separate hard lumps, like nuts (hard to pass)



### ● Type 2

Sausage-shaped but lumpy



### ● Type 3

Like a sausage but with cracks on its surface



### ● Type 4

Like a sausage or snake, smooth and soft



### ● Type 5

Soft blobs with clear-cut edges (passed easily)



### ● Type 6

Fluffy pieces with ragged edges, a mushy stool



### ● Type 7

Watery, no solid pieces. Entirely liquid

2. Lewis SJ, Heaton KW. Stool form scale as a useful guide to intestinal transit time. Scand. J. Gastroenterol.1997; 32: 920-4.

## Skin symptoms

### SCORE

0 to 6 Atopic eczema

	HEAD-NECK TRUNK	ARMS-HANDS LEGS-FEET
Absent	0	0
Mild	1	1
Moderate	2	2
Severe	3	3

0 or 6 Urticaria

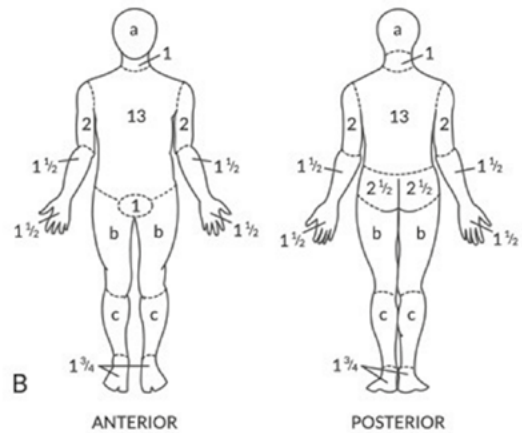
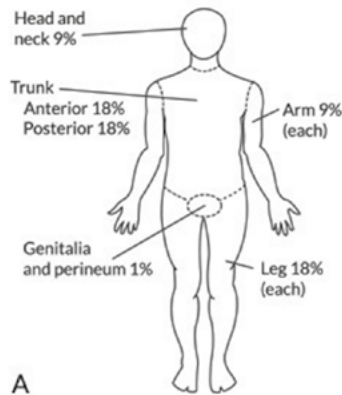
	NO	YES
	0	6

## SKIN

- An easy to apply score based on an estimation of the surface covered by the dermatitis, using the surface estimation drawings from burns.

### Estimated surface:

- 0 = 0
- < 1/3rd = 1
- 1/3-2/3rd = 2
- > 2/3rd = 3



Relative percentage of body surface areas (%BSA) affected by growth

	0 yr	1 yr	5 yr	10 yr	15 yr
a - 1/2 of head	9 1/2	8 1/2	6 1/2	5 1/2	4 1/2
b - 1/2 of 1 thigh	2 3/4	3 3/4	4	4 1/4	4 1/2
c - 1/2 of 1 lower leg	2 1/2	2 1/2	2 3/4	3	3 1/4

## RESPIRATORY

- Respiratory symptoms are considered in the CoMiSS™ although they have been given less importance (lower weighting) because most of the time chronic cough, runny nose and even wheezing are caused by viral infections.
- However, respiratory symptoms can be caused by cow's milk.

## Respiratory symptoms

### SCORE

- 0 No respiratory symptoms
- 1 Slight symptoms
- 2 Mild symptoms
- 3 Severe symptoms

- ▶ Chronic cough
- ▶ Runny nose
- ▶ Wheezing

# CoMiSS™

## *the scoring*

The CoMiSS™ score ranges from 0 to 33.

Each symptom has a maximal score of six, with the exception of respiratory symptoms (maximal score of three).

An arbitrary cut-off value of  $\geq 12$  was selected as the criterion to pick up infants at risk of CMPA. A score of 12 requires the presence of at least two severe symptoms and a score higher than 12 requires the presence of at least three symptoms and the involvement of two organ systems.



### USING THE SCORING FORM

If there is a suspicion of cow's milk-related symptoms, rate the observed/reported symptoms by choosing the most appropriate score for each type of symptom.

#### Calculate the final score:

- ➔ **Total  $\geq 12$ :** This arbitrary cut-off value indicates that the symptoms are likely cow's milk related. This could potentially be CMPA. However, a CMPA diagnosis can only be confirmed by an elimination diet followed by an oral food challenge.
- ➔ **Total  $< 12$ :** symptoms less likely related to cow's milk. Look for other causes.



**NestléHealthScience**  
Where Nutrition Becomes Therapy

[NestleHealthScience.com/CoMiSS](http://NestleHealthScience.com/CoMiSS)

Nestlé Health Science and its logo are trademarks of Société des Produits Nestlé S.A. part of the Nestlé Group.  
TM Trademark of Société des Produits Nestlé S.A.  
Copyright © 2015 Société des Produits Nestlé S.A.  
Nestlé Health Science S.A. is a registered company in Switzerland n° RCS 55010800237.  
Photo credits: BLOOM images/Getty images. Bristol Stool Chart used with permission from the Rome Foundation.