

# Knowledge and Practice of Mothers about Infantile Colic Attending Central Pediatric Teaching Hospital in Baghdad

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## Abstract

**Background:** Infantile colic is a difficult experience met by the parents in the first few months of an infant's life. Infantile colic is traditionally defined by the Wessel's criteria "rule of 3s" in an infant who is well-fed and otherwise healthy. The cornerstones in the management of infantile colic are parental reassurance and education.

**Objectives:** To assess the maternal knowledge regarding infantile colic causes and management strategies and to identify the association of some sociodemographic factors with their knowledge.

**Subjects and method:** A cross-sectional study was done among mothers in Central Pediatric Teaching Hospital during their visit to consultation, emergency room, and any ward of the hospital with infant's age ranged between 1-5 months with infantile colic, corresponding to modified Wessel criteria. One hundred seventy-two participants were interviewed face to face using a questionnaire of 45 questions.

**Results:** From total of 172 mothers, the majority of infants' ages were two months and most of them were males and they were on mixed feeding. The majority of mothers' ages between 20-24 years old and they were housewives with 61.0% of them were secondhand smoke. The majority (76.2%) of the mothers depend on family and friends as a sources of knowledge. They were thinking that colic attacks would increase because of the food the mothers ate, due to the mothers not keeping themselves warm, and formula feeding. The behavioral soothing techniques most widely used were keep baby in a sitting position when feeding; massage the baby, lay them a cross your lap and gently rub their back, placing baby in a dim, quiet room, and changing mother's diet and drinking if the mother breast feeding. Almost all mothers (90.7%) said that the drops had a benefit in the treatment of colic and change in formula effective in reducing the symptoms of infantile colic.

**Conclusion:** The parents should be informed that infantile colic is a self-limiting condition, will not harm their babies. They also should be use the pharmacological treatment under the supervision of doctor assurance.

**Key Words:** Knowledge, Practice, Infantile Colic.

## Introduction:

Infantile colic (IC) is a difficult experience met by the parents in the first few months of an infant's life. It is a condition in which an infant shows signs of distress such as crying, moaning, clenching of the fists, and flexion of the hips for a considerable period without any specific reason. Crying is concentrate in the late afternoon and evening, occurs in prolonged bouts and is unpredictable and spontaneous. <sup>[1, 2]</sup>

The condition typically presents in the second or third week of life, peaks around 6 weeks, and resolves by the age of 12 weeks in 60% of infants, and by 16 weeks of age in 90%. <sup>[3]</sup> It is estimated that this condition affects about 10%–30% of infants worldwide. <sup>[1]</sup>

Colic is traditionally defined by the Wessel's criteria "rule of 3s" of crying or fussing more than three hours of the day for more than three days of the week and for longer than three weeks in an infant

who is well-fed and otherwise healthy. <sup>[4]</sup> Colic is a diagnosis of exclusion that is made after performing a careful history and physical examination to rule out less common organic causes. <sup>[5,6]</sup>

While an etiology of infantile colic is not completely understood, it is believed that it has a multifactorial reason. Potential risk factors for colic include organic and psychosocial reasons such as food allergy/intolerance (cow milk, soy protein, etc.), gas, intestinal hormone abnormalities, constipation, gastroesophageal reflux, irregularity of the nervous system, insufficient or unsuitable mother-baby interaction, smoking and anxiety of the mother. <sup>[7]</sup> Since treatments for colic are controversial and inconsistent, the role of the physician as a counselor and educator to parents is critical. <sup>[3]</sup>

The current study was conducted to assess the maternal knowledge regarding infantile colic causes and management strategies and to identify the association of some sociodemographic factors with their knowledge.

## Subjects and method:

A cross-sectional study was done in Central Pediatric Teaching Hospital in Baghdad during the period of four months from 1<sup>st</sup> of April to 30<sup>th</sup> of July /2022. A convenient sample of 200 mothers who have infants aged from 1-5 months, were interviewed directly to know if their infant has infantile colic (frequency, duration) that fulfill the criteria according to modified Wessel criteria, so total sample size included in this study was 172 mothers with infant has criteria of IC.

The inclusion criteria were mothers who attended the Central Pediatric Teaching Hospital during their visit to consultation, emergency room and any ward of the hospital with infant's age ranged between 1-5 months with infantile colic, corresponding to modified Wessel criteria. While exclusion criteria were the mothers with infant aged above 5 months or infants with other than their mothers (i.e. grandmother, father...).

A questionnaire developed by researchers after reviewing several studies on infantile colic and then the questionnaire revised by three experts (two family medicine and one pediatrician) and their notes were taken into consideration.

The questionnaire included three parts: First part consists of characteristic data for infant variables and sociodemographic data of mother variables. The infant variables as infant age, gender, birth order of baby in family, feeding status, if this infant isn't the first: Did any other child in your family have colic? While the mother variables as age of the mother, education status, job status, gestational weeks of pregnancy in current baby, mother smoking behavioral/secondhand smoke, types of delivery in addition to source of knowledge of mother. The second part consists of 9 questions regarding knowledge of mothers about some factors that may be attributed to infantile colic and the third part consists of 19 questions regarding practice about management options (twelve questions for non-pharmacological options and seven questions of pharmacological options). And the fourth part included question about who helps the mothers in the previous IC attacks (family members, friends and/or depend on herself).

Each question in second and third parts rated on 3 points (Likert respondent scale) it was scored by assigning a score of (3) for "yes or always", (2) for "I don't know or sometimes" and score of (1) for "no or never". The questions regarding knowledge of mothers about some factors may attribute with infantile colic were 9 questions so the minimum score= 9, maximum score= 27, and the median Score

= 18. A score of more than 75% was considered good (>22 score), 50-74% moderate (19-22 score) and less than 50% was taken as poor (<=18 score). The questions regarding practice about management options: A: Non pharmacological options were 12 questions so the minimum score= 12, maximum score= 36, and the median score = 24. A score of more than 75% was considered good (>30 score), 50-74% moderate (25-30 score) and less than 50% was taken as poor (<=24 score). The questions regarding practice about management options: B: Pharmacological options were 7 questions, the minimum score= 7, maximum score= 21, and the median score = 14. A score of more than 75% was considered good (> 17 score), 50-74% moderate (15-17 score) and less than 50% was taken as poor (<=14 score).

The pilot study has been done for 20 mothers with their infants (age from 1-5 months) to test the clarity and applicability of the questionnaire, time needed to interview and to address any difficulties that may be faced during the study. All twenty mothers were not included in the study.

The researcher proposal was fully discussed and approved by the Ethical and Scientific Committee of Iraqi Board of Family Medicine. The agreement of health authority in the Central Pediatric Teaching Hospital was taken before starting data collection. Verbal consent was taken from each participant after full explanation of the aim of the study and insuring her about the confidentiality of collecting data which wouldn't be used for any purpose other than current study and the collected data would be anonymous.

Analysis of data was carried out using the Statistical Packages for Social Sciences- version 28. Data were presented in simple measures of frequency, percentage, mean, median, standard deviation and range (minimum-maximum values). The significance of difference of different percentages (qualitative data) were tested using Pearson Chi-square test with application of Fisher Exact test whenever applicable. Statistical significance was considered whenever the P value was equal or less than 0.05.

## Results:

From total of 172 mothers, the majority of infants' ages were two months and most of them were males and they were on mixed feeding. The majority of mothers' ages between 20-24 years old and they were housewives with 61.0% of them were secondhand smoke as shown in table 1 and table 2.

**Table 1: Characteristic variables of infants (n=172) in Central Pediatric Teaching Hospital in Baghdad, 2022.**

		N=172	
		n	%
infant's age (months)	One	28	16.3
	Two	49	28.5
	Three	31	18.0
	Four	34	19.8
	Five	30	17.4
infant's gender	Male	89	51.7
	Female	83	48.3
Birth order of infant in family	First	70	40.7
	Second	44	25.6
	Third	17	9.9
	Fourth	20	11.6
	Fifth & more	21	12.2
Other child in your family has infantile colic	Only baby in family	70	40.7
	Yes	83	48.3
	No	19	11.0
Feeding status	Breast feeding	32	18.6
	Formula feeding	52	30.2
	Mixed (Breast & Formula)	53	30.8
	Breast & Solids	5	2.9
	Formula & Solids	17	9.9
	Breast/ Formula/ Solids	13	7.6

**Table 2: Sociodemographic variables of mothers in Central Pediatric Teaching Hospital in Baghdad, 2022.**

Mother age (years)	<20years	26	15.1
	20---24	53	30.8
	25---29	35	20.3
	30---34	27	15.7
	=>35years	31	18.0
Mother education	Illiterate/ Read & write	16	9.3
	Primary	47	27.3
	Secondary	45	26.2
	College & higher	64	37.2
Job status	Housewife	117	68.0
	Student	21	12.2
	Employed	34	19.8
Gestational weeks of pregnancy in current baby	<37 weeks	11	6.4
	37---41	158	91.9
	> 41 weeks	3	1.7
Mother smoking behavioral/ Secondhand smoke	Non smoker	172	100%
	Secondhand smoke\no	67	39.0
	Secondhand smoke\yes	105	61.0
Type of delivery	Vaginal delivery	79	45.9
	Cesarean section	93	54.1

Table 3 shows that the majority (76.2%) of the mothers depends on family and friends as a source of knowledge. The mothers were thinking that colic attacks would increase because of the food the

mothers ate, due to the mothers not keeping themselves warm, and formula feeding as shown in table 4.

**Table 3: Source of knowledge of mothers in Central Pediatric Teaching Hospital in Baghdad, 2022.**

Source of knowledge of mother	n	n%
PHC & Doctor	86	50.0
Family & Friends	131	76.2
TV & Social media	28	16.3

\* More than one answer can be chosen

Table 4: Frequency distribution of knowledge of mothers about some factors may attribute with infantile colic

Knowledge of mothers about some factors may attribute with infantile colic	Yes		No		I don't know	
	No	%	No	%	No	%
Breastfeeding mother's diet contribute to infant colic	139	80.8	10	5.8	23	13.4
Colic is a physiological condition	151	87.8	16	9.3	5	2.9
Colic is an illness	13	7.6	151	87.8	8	4.7
Breast feeding relive colic	103	59.9	22	12.8	47	27.3
Formula feeding has no effect on colic	20	11.6	128	74.4	24	14.0
If mother keeps herself warm this will avoid infant colic	86	50.0	42	24.4	44	25.6
Infantile colic harm the baby in the future	17	9.9	143	83.1	12	7.0
Maternal depression and anxiety may induce aggravate infantile colic	124	72.1	21	12.2	27	15.7
Maternal smoking aggravates infant colic	117	68.0	11	6.4	44	25.6

\*The green color represents the right answer

The behavioral soothing techniques most widely used were keep baby in a sitting position when feeding; massage the baby, lay them a cross

your lap and gently rub their back, placing baby in a dim, quiet room, and changing mother's diet and drinking if the mother breast feeding (table 5).

**Table 5: Frequency distribution of non-pharmacological management options of infantile colic**

Practice about management options: A:Non pharmacological options:	Always		Sometimes		Never	
	n	n%	n	n%	n	n%
Try infant messaging (i.e. the abdomen)	132	76.7	7	4.1	33	19.2
Bathing the baby	47	27.3	45	26.2	80	46.5
Taking baby around by car	8	4.7	98	57.0	66	38.4
Give pacifier	42	24.4	97	56.4	33	19.2
Lay them a cross your lap and gently rub their back	100	58.1	13	7.6	59	34.3
Swaddle them snugly in a blanket	54	31.4	92	53.5	26	15.1
Putting a warmed towel on the baby's stomach	-	-	150	87.2	22	12.8
Play soft music white noise or use an infant swing to ease the crying	30	17.4	72	41.9	70	40.7
Gently squeezing the acupressure point between the baby's thumb & finger (on the webbing) may help to calm a fussy child	-	-	172	100	-	-
Placing baby in a dim, quiet room may help calm the baby	97	56.4	12	7.0	63	36.6
Keep baby in a sitting position when feeding; massage her back to get rid of gas bubbles. Burp after every30ml_60ml or 1/4 cup of formula	167	97.1	-	-	5	2.9
Changing mother diet and drinking if the mother breast feeding	97	56.4	19	11.0	56	32.6

\*The green color orange represents the right answer

According to table 6, almost all mothers (90.7%) said that the drops had a benefit in the treatment of

colic and change in formula effective in reducing the symptoms of infantile colic.

**Table 6: Frequency distribution of pharmacological options of mothers practice for infantile colic**

Practice about management options:	Always		Sometimes		Never	
	n	n%	n	n%	n	n%
B:Pharmacological options:						
Drops are of a benefit in treatment of infantile colic	156	90.7	5	2.9	11	6.4
Gripe water helps with infant colic	64	37.2	40	23.3	68	39.5
Prophylactic probiotics ("friendly bacteria") help improve symptoms of infant colic	17	9.9	148	86.0	7	4.1
Traditional herbal tea reduces the symptoms of infant colic	55	32.0	47	27.3	70	40.7
Change in formula effective in reducing the symptoms of infant colic	75	43.6	33	19.2	64	37.2
Never give herbs for colic to an infant unless doctor tells you	117	68	-	-	55	32
Never give drugs for colic to an infant unless doctor tells you	116	67.4	-	-	56	32.6

\*The green color represents the right answer

Table: 7 shows that there was a fair level score regarding knowledge and non-pharmacological practice for IC (more than half) and to less extent for

fair level score for pharmacological options used for IC.

**Table 7: scoring level of knowledge and practice.**

		No	%
Knowledge score (9Q)	Poor (<=18)	40	23.3
	Fair (19-22)	119	69.2
	Good (>22)	13	7.6
	Mean±SD (Range)	19.4±2.1	(13-24)
Practice about management options score:		n	n%
Non-Pharmacological practice score (12Q)	Poor (<=24)	62	36.0
	Fair (25-30)	110	64.0
	Good (>30)	-	-
	Mean±SD (Range)	24.9±2.1	(20-30)
Practice about management options score:		n	n%
Pharmacological practice score (7Q)	Poor (<=14)	79	45.9
	Fair (15-17)	81	47.1
	Good (>17)	12	7.0
	Mean±SD (Range)	16.4±3.1	(9-21)

**Discussion:**

Infantile colic is a distressing experience for parents during the first few months of their infant's life and the effect of which remains unclear due to the self-limiting nature of the illness. Despite the introduction of several treatment approaches for infantile colic, no definitive treatment has so far been provided for this problem. <sup>[1]</sup>

From the proposed results, higher percent of infants aged two months, same finding with Ünal et al., 2021<sup>[5]</sup> who evaluated the knowledge level and attitude of mothers about infantile colic and reported that the average age of infants 2.5±1.7 months.

In this study, the majority of the infants diagnosed with IC were boys and most of them were on mixed feeding (breast and formula). Didişen *et al.*, 2020 <sup>[8]</sup>

reported the total mean score was found to have no statistically significant differences in terms of the infant's gender, the way of feeding, the use of a feeding bottle, the use of a pacifier. While Selda ATEŞ BEŞİRİKa., 2021 <sup>[9]</sup> a study of 248 infants aged 0-12 months found that the severity of colic is more common in infants who are male, 0-3 months old, use the bottle horizontally and take a pacifier.

According to some sociodemographic variables of mothers, most of the mothers' ages were between 20-24 years old; college or higher education, housewives, gestational weeks of pregnancy in current baby was between 37-41 weeks and delivered by cesarean section. This observation was in congruent with a Turkish study in 2021; <sup>[5]</sup> which reported that the mother's ages between 17-41 years



old with average (29.8±5), most of them with high school education, gestational week between 37-41 weeks and CS was the type of delivery, represent by 34.0%, 79.3% and 55.3% respectively, while in another study by Demirel *et al*, 2018 <sup>[10]</sup> most of mothers were in the 21-30 ages group, 33.8% were secondary school graduates, also, 79.1% of women were not working, but still caesarean section was the type of delivery same as in this study and a Turkish study in 2021. <sup>[5]</sup>

In a study done by Rutayisire, *et al*, 2016 <sup>[11]</sup> showed that the diversity and colonization pattern of the gut microbiota were significantly associated to the mode of delivery during the first 3 months of life, however; the observed significant differences disappear after 6 months of infant's life. Given the evidence that infants delivered by caesarean section lacked the early support of breast milk as stimulator for a physiological gut microbiota, and thus breast milk contains microbes such as *Lactobacilli* and *Bifidobacteria* and this may be a direct source of higher colonization rates of these genera in vaginally delivered than in CS delivered infants. Following 6 months of age, no difference observed between the vaginally delivered and CS delivered infants. This agree with scientific research showing that CS cause a change to the friendly gut bacteria in the baby (and cesarean section's babies can display irritable and more colic or at least colic like symptoms). <sup>[12]</sup>

In this study, the secondhand smoke was 61.0%, Reijneveld *et al.*, <sup>[13]</sup> assessed the association of maternal smoking and type of feeding with colic in 3345 children aged 1–6 months. The prevalence of colic was twofold higher among infants of smoking mothers, but less among breastfed infants, three distinct lines of evidence were used to construct the hypothesis. First, mothers who smoke are twice as likely to have infants with colic. Second, exposure to nicotine and other tobacco smoke metabolites causes higher-than-average blood motilin concentrations. Finally, pediatric studies suggest that high motilin levels may predispose infants to colic. <sup>[14]</sup> Shenassa and Brown, <sup>[15]</sup> was investigating six studies about the link between maternal smoking and infantile colic, only one of these studies defined according to Wessel's rule of threes and the remaining studies used definitions of excessive crying but not necessarily colic. The results from five of these studies suggest that there was an independent association between maternal smoking and excessive crying, as well as IC.

Concerning to source of knowledge of mothers, it was found that most of the mothers depend on family and friends whereas, these finding disagreed with Ünal *et al.*, 2021 <sup>[5]</sup> who reported that less than half

of mothers received information from health professionals. If mothers took their advice from unknowledgeable source this may lead to negative consequences on the infants' health, this was the main message delivered by Indrio *et al.*, 2017 <sup>[16]</sup> in his study about " knowledge, attitudes, and practices of pediatricians on infantile colic in the Middle East and North Africa region" and indicated that the traditional approach of parental reassurance does not adequately satisfy the worries of the parents, which could lead to the use of alternative other approaches suggested by family, friends or the internet. since internet and social media are important for families to get accurate information, as mothers use the internet and social media, same concern found in Iranian study 2021; <sup>[17]</sup> were the mothers asked different people for different solutions. However, they could not make a definitive decision because of conflicting recommendations.

Regarding type of infant feeding and knowledge of mothers about if breast feeding relieves colic, and if formula feeding has no effect on colic. Infants feeding in this study depended mostly on mixed feeding, and on bottle feeding, while less on breast feeding and this may lead them to false answer. About the above question. The answer was right for both questions by 12.8% and 11.6% of mothers respectively, while higher percentage of right answer found by study done by Karabel *et al.*, 2010 <sup>[18]</sup> who conducted study to "evaluate the treatment approaches and risk factors in infantile colic in Turkey" and found that the data on the relation between nutrition type and colic development were controversial, no significant relation was found between colic incidence and nutrition type. These results supported by Didişen *et al.*, 2020 <sup>[8]</sup> who performed research about "infantile colic in infants aged one-six months and the practices of mothers for colic" and reported that about two-fifths of mothers were feeding their infants by both breast milk and formula. Few mothers changed breastfeeding to bottle feeding as a solution to reduce the crying episodes in study done in Oman 2018. <sup>[19]</sup>

If breastfeeding mother's diet contribute to IC, if mother keeps herself warm this will avoid IC and maternal depression and anxiety may induce aggravate IC, mothers were answer these questions (yes) by 80.8 %, 50.0% and 72.1% respectively. When mothers were asked about the factors that could cause IC by Ünal *et al.*, 2021 <sup>[5]</sup> almost same result with first two questions (89.3%, 65.3%) while differ in last question 40%.

Mutlu *et al.*, 2020 <sup>[20]</sup> determined that 89.5% of mothers avoided gassing foods in reducing colic attacks and 35.4% kept their feet warm. Our study agreed with Iranian study, <sup>[17]</sup> that maternal

persistence anxiety and depression is another sub category, in general the mother's mental status affects the quality of life and care. Same to a study done by Demirel *et al.*, 2018<sup>[10]</sup> which showed that the interaction between the mother and the baby and stress in the mother are important factors in the appearance of colic and the stress of the parents increases when they cannot manage it.

About non-pharmacological management options of IC, almost all mothers knew that keeping baby in a sitting position when feeding, that massaging back, and burp after feeding relive IC, also 3\4 of the mothers knew that try infant messaging (i.e. the abdomen) relive infantile colic, a review published in 2016 provided evidence that pediatric massage therapy is effective in treating the IC. This involves providing soothing massage to the infant, which can be enjoyable to mothers and also has fewer side effects than other management.<sup>[21]</sup> Same for study done by Saadoon *et al.*, 2018<sup>[19]</sup> and Çiftçi and Arıkan.<sup>[22]</sup> Although the positive effects of massaging babies (chiropractic or abdominal massage) on sleep, stress and crying time have been reported, its effectiveness in reducing symptoms is still controversial.<sup>[23]</sup>

Shimaa Abdelrahim Khalaf *et al.*, 2023<sup>[24]</sup> “who reported bathing the baby, taking the baby around outside the home and give pacifier were similar to the present study. In addition, this study was in the same line with Didişen *et al.*, 2020<sup>[8]</sup> Bagherian *et al.*, 2021<sup>[17]</sup> regarding relieving IC by changing position. Other behavioral methods noted in this study were similar to study in Turkey 2020<sup>[8]</sup>; swaddle them snugly in a blanket, play soft music or white noise or use an infant swing to ease the crying and placing baby in a dim, quiet room may help calm the baby. Van Sleuwen *et al.*,<sup>[25]</sup> reported that swaddling babies younger than 8 weeks’ old provided a statistically significant reduction in durations of crying. Other Turkish study 2018;<sup>[10]</sup> determined that mothers preferred getting the baby to listen to light noise and machine noises in similar rates with the purpose of reducing IC.

This study shows that only about 37% never change formula milk to reduce IC symptoms. A cross-sectional study in 2014<sup>[26]</sup> found that the most common reason for changing the formula was found to IC pain in the infants in Saudi Arabia. In spite of that more than half of mothers never give drugs or herbal tea to their infants for IC, still less than half of them not give herbal tea (right answer) and to lesser percentage never give drops same for other questions (and this also found in non-pharmacological options) and this may raise the difficult experience mothers face.

A Turkish study in 2021;<sup>[5]</sup> showed that 66% of the mothers stated that they could or would use drops for colic attacks. First common used was probiotic drops (36%), followed by simethicone 26.3%, while more than 1\2 use tea (mostly fennel) only 19.3% use herbal drops. Al Saadoon *et al.*,<sup>[19]</sup> reported that the use of probiotics have shown some effectiveness. While Didişen *et al.*,<sup>[8]</sup> found no difference between the groups who did or did not receive pharmacological treatment in terms of the healing time of colic These results compared with Al-Shehri *et al.*, 2016<sup>[1]</sup> who revealed that more than one-quarter of mothers know that using of herbal medicines treat colic and Bele *et al.*, 2014<sup>[27]</sup> who conducted study in a village in South Africa showed the misconceptions about IC, use of self-medication, cultural norms, taking the baby to the traditional and religious practitioners.

There was a fair level score regarding knowledge and non-pharmacological practice for infantile colic (more than half) and to less extent fair level score for pharmacological options used for IC. In a study done in 2020; it was found that the frequency of performing some practices that have high utilization rate was low.<sup>[20]</sup> While the Nigerian mothers<sup>[28]</sup> and women in Limpopo Province, South Africa,<sup>[27]</sup> showed deficiency in their knowledge of IC. This variation in levels of knowledge and practice scoring of IC may be due to socioeconomic background, access to health care, or effects of families and friends especially in these countries which depend on cultural or traditional norms.

### **Conclusion and Recommendation:**

Many treatments are being done to control infant colic, which include counseling treatments, but a single treatment that works for all infants is still not available, and this make the IC as a major burden for the infant himself and his parents.

The mothers thinking that colic attacks would increase because of the food the mothers ate, due to the mothers not keeping themselves warm and formula feeding. And almost all mothers said that the drops had a benefit in the treatment of colic and change in formula effective in reducing the symptoms of IC. So, there was a fair level score regarding knowledge and non-pharmacological practice for IC (more than half) and to less extent for fair level score for pharmacological options used for IC.

So it was recommending that the health care providers to provide education for the definition of IC and how deal with consequences and updated information of colic. Parents should be educated about the benign and self-limited nature of IC, with more information about disease and its management

can improve their self-efficacy and care-giving. Availability of brochures, booklets and educational material in primary health care centers and maternal hospitals to increase awareness regarding IC and how to control.

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