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Anaphylaxie en 2015 : reconnaître, traiter que doit savoir le pédiatre ?

Issy-les-Moulineaux, 19 novembre 2015

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2 histoires cliniques

Martine, 4 ans

Aucun ATCD connu
Apéritif familial
Consommation d'arachide

M10 : urticaire
M15 : difficultés à parler
M25 : anti-H1, B2 (maison médicale)
M40 : aggravation des signes
M45 : adrénaline IM
M50 : récupération

Sarah, 6 ans

LAL
Intensification n°1
Aspariginase

M1 : pâleur
M2 : faciès stuporeux
M3 : douleurs abdominales
M5 : chute tensionnelle
M6 : adrénaline IM
M9 : récupération

Anaphylaxie – reconnaître : définition

HAS
HAUTE AUTORITÉ DE SANTÉ

Fiche mémo
Conduite à tenir
après le traitement d'urgence
d'une suspicion d'anaphylaxie
Octobre 2013

L'anaphylaxie est la manifestation la plus grave des réactions d'hypersensibilité immédiates.

Il s'agit d'un syndrome clinique faisant craindre la mise en jeu du pronostic vital. Ce syndrome clinique associe de manière variable des signes respiratoires (dyspnée et bronchospasme et/ou circulatoires (tachycardie et/ou hypotension, collapsus).

Il existe le plus souvent des signes cutanés (urticaire), et des signes muqueux (œdème du pharynx et/ou du larynx. L'œdème est grave lorsqu'il touche le larynx). Pour les enfants, les signes peuvent être une léthargie, un malaise. D'autres signes cliniques (douleurs abdominales, diarrhée, vomissement) peuvent être également associés.

Simons *et al. World Allergy Organization Journal* 2014, **7**:9
http://www.waojournal.org/content/7/1/9

WAO journal
WORLD ALLERGY ORGANIZATION

CONSENSUS DOCUMENT Open Access

International consensus on (ICON) anaphylaxis

Table 1 Overview of collaborating organizations' principal anaphylaxis guidelines[1]

	WAO Guidelines	AAAAI/ACAAI[2] Guidelines	EAACI Guidelines
Year of publication	2011	2010	2014
Authors	Simons FER et al (10 co-authors)	Lieberman P et al (15 contributors)	Muraro A et al (28 co-authors)
Countries represented by authors	Argentina, Canada, Egypt, Germany, Italy, Singapore United Kingdom, United States, Venezuela	United States	Canada, Denmark, France, Germany, Italy, Ireland, The Netherlands, Poland, Portugal, Spain, Switzerland, United Kingdom
Definition of anaphylaxis	"a serious life-threatening generalized or systemic hypersensitivity reaction" and "a serious allergic reaction that is rapid in onset and might cause death"	"an acute life-threatening systemic reaction with varied mechanisms, clinical presentations, and severity that results from the sudden release of mediators from mast cells and basophils"	"a severe life-threatening generalized or systemic hypersensitivity reaction"

des présentations cliniques

Table 1 Signs and symptoms of anaphylaxis

Symptoms	All ages [3••]		Children [11]	
	Clinical features	Frequency	Clinical features	Frequency
Respiratory	Dyspnea, wheeze	45 %–50 %	Difficulty/noisy breathing	83 %
	Upper airway angioedema	50 %–60 %	Wheeze	59 %
	Rhinitis	15 %–20 %	Cough	33 %
			Swelling tongue	13 %
			Swelling/tightness in throat	11 %
			Difficulty talking/hoarse voice	13 %
Cutaneous	Urticaria, angioedema	85 %–90 %	Urticaria	72 %
	Flushing	45 %–55 %	Angioedema	55 %
	Pruritus without rash	2 %–5 %	Pruritus	11 %
Gastrointestinal	Nausea, vomiting, diarrhea, cramping pain	25 %–30 %	Vomiting, diarrhea, abdominal cramps	29 %
Cardiovascular	Dizziness, syncope, hypotension	30 %–35 %	Hypotension, pale and floppy, impaired/loss of consciousness, collapse	17 %

Anaphylaxie : classification de sévérité

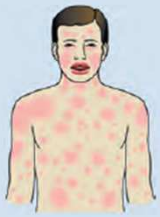
Grade	Symptômes
I	Signes cutanés généraux : érythème, urticaire / angio-œdème
II	Au moins 2 organes atteints : signes cutanés symptômes respiratoires (bronchospasme, toux, dyspnée) symptômes digestifs
III	HypoTA / collapsus, tachycardie ou bradycardie, arythmie
IV	Arrêt cardiaque et/ou respiratoire, décès

L'absence de tachycardie, de signes cutanés, n'exclut pas le diagnostic d'une réaction anaphylactique.

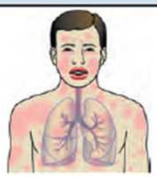
Sampson HA et al. Second symposium on the definition and management of anaphylaxis: summary report-Second National Ins- titute of Allergy and Infectious Disease/Food Allergy and Anaphylaxis Network Symposium. J Allergy Clin Immunol 2006;117:391-7.

6

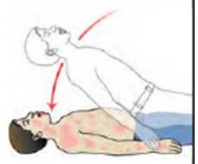
1 Sudden onset of an illness (minutes to several hours), with involvement of the skin, mucosal tissue, or both (e.g. generalized hives, itching or flushing, swollen lips-tongue-uvula)



And at least one of the following:

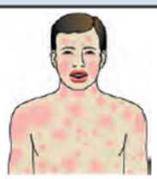


Sudden respiratory symptoms and signs (e.g. shortness of breath, wheeze, cough, stridor, hypoxemia)

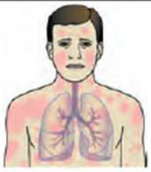


Sudden reduced BP or symptoms of end-organ dysfunction (e.g. hypotonia [collapse], incontinence)

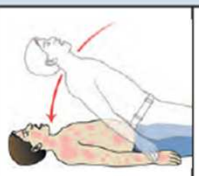
Or **2** Two or more of the following that occur suddenly after exposure to a ***likely allergen or other trigger**** ***for that patient*** (minutes to several hours):



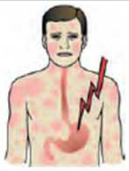
Sudden skin or mucosal symptoms and signs (e.g. generalized hives, itch-flush, swollen lips-tongue-uvula)



Sudden respiratory symptoms and signs (e.g. shortness of breath, wheeze, cough, stridor, hypoxemia)



Sudden reduced BP or symptoms of end-organ dysfunction (e.g. hypotonia [collapse], incontinence)



Sudden gastrointestinal symptoms (e.g. crampy abdominal pain, vomiting)

Or **3** Reduced blood pressure (BP) after exposure to a ***known allergen**** (minutes to several hours):

2012 Update: World Allergy Organization Guidelines for the assessment and management of anaphylaxis

ORIGINAL ARTICLE — ANAPHYLAXIS

First European data from the network of severe allergic reactions (NORA)

Allergy **69** (2014) 1397–1404 © 2014 John Wiley & Sons

M. Worm[1], A. Moneret-Vautrin[2], K. Scherer[3], R. Lang[4], M. Fernandez-Rivas[5], V. Cardona[6], M. L. Kowalski[7], M. Jutel[8,9], I. Poziomkowska-Gesicka[10], N. G. Papadopoulos[11,12], K. Beyer[13], T. Mustakov[14], G. Christoff[15], M. B. Bilò[16], A. Muraro[17], J. O. B. Hourihane[18] & L. B. Grabenhenrich[19]

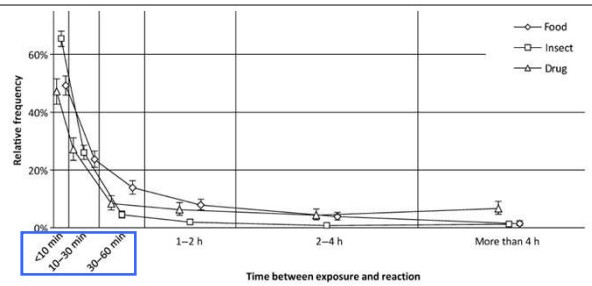
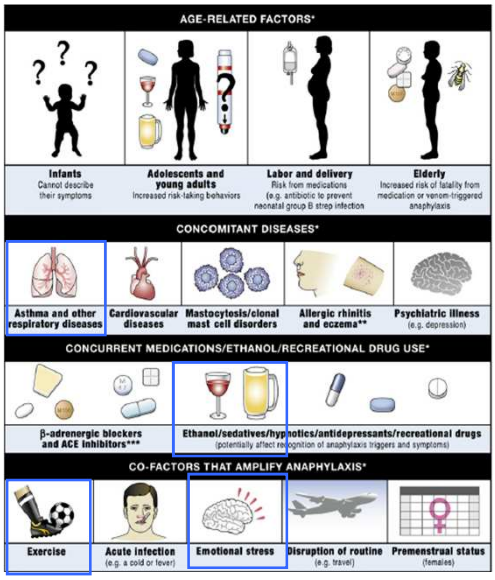


Figure 1 Interval between exposure and anaphylactic reaction, by eliciting agent. Only cases with a single known or highly suspected elicitor and data on exposure–symptom interval ($n = 2688$). All countries. Error bars indicate 95% confidence intervals.

une anaphylaxie sévère survient habituellement max : 1-2H (surtout < 30 min)
délai parfois + long (médicaments)
+ c'est grave, + ça va vite…

CO… facteurs… & Co !



EAACI

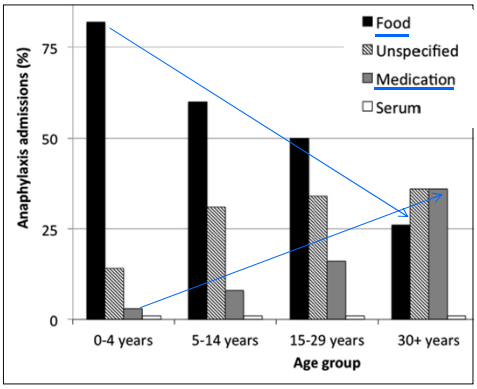
incidence en (constante) augmentation

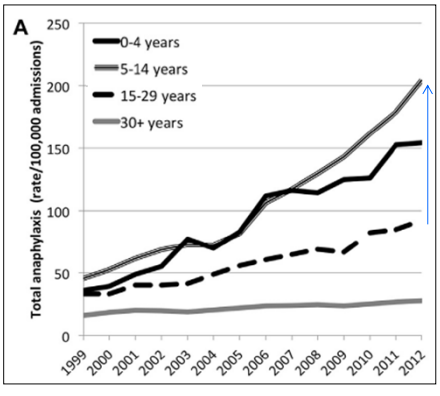
Time trends in Australian hospital anaphylaxis admissions in 1998-1999 to 2011-2012

Available online July 14, 2015.

Raymond James Mullins, MB BS, PhD, FRACP, FRCPA,[a,b,c] Keith B. G. Dear, MA, MSc, PhD,[d,e] and Mimi L. K. Tang, MB BS, PhD, FRACP, FRCPA[f,g,h]

Canberra and Melbourne, Australia, Durham, NC, and Kunshan, China





Anaphylaxis epidemic: Fact or fiction?

F. Estelle R. Simons, MD, FAAAAI,[a] and Hugh A. Sampson, MD, FAAAAI[b] J Allergy Clin Immunol 2008;122:1166-8

TABLE I. Is anaphylaxis overdiagnosed?

Subjective symptoms only* in highly atopic
Nonspecific signs†
Diagnostic error‡
Hyperventilation
Anxiety
Panic attack (difficulty breathing)
Vasovagal episode (faint)
Munchausen syndrome
Scombroidosis
Anisakiasis

TABLE II. Is anaphylaxis underdiagnosed?

Reasons for potential underdiagnosis of anaphylaxis
First episode
Trigger not apparent, hidden, or not previously recognized
Idiopathic anaphylaxis
Failure to recognize (by patient or caregiver) because of:
Cognitive, visual or auditory impairment
Neurologic, psychiatric, or psychologic problems*
Use of medications, including sedating H_1-antihistamines drugs, or use of ethanol
Failure to diagnose (by health care professional) because of:
Absence of skin symptoms and signs
Patient not undressed or fully examined
Vulnerable person: infant, elderly
Patient who cannot describe subjective symptoms because
Aphonic or dysphonic
Dyspneic
Unconscious

Réactions secondaires aux vaccins : distinguer le vrai du faux

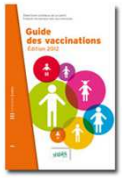
R. Cohen[a,b,c], E. Grimprel[b,c,d] Archives de Pédiatrie 2012;19:182-185

- effets indésirables / réactions secondaires
- fréquence spontanée de manifestations cliniques diverses vs nombre considérable de vaccinations

Vaccins	Risque d'anaphylaxie	Références
Diphtérie-tétanos-poliomyélite	8,6/million de doses	Bohlke et coll., Pediatrics 2003
Rougeole-oreillons-rubéole	3,5-14,4/million de doses	Bohlke et coll., Pediatrics 2003
Hépatite B	1,1/million de doses	Bohlke et coll., Pediatrics 2003
Fièvre jaune	4,2/million de doses	Kelson et coll., J Allergy Clin Immunol 1999
Influenza	0,24/million de doses	MMWR Morb Mortal Wkly Rep 1999
Encéphalite à tique	0,8-2,4/million de doses	Zent et coll., Vaccine 2004

JC. Caubet, PA. Eigenmann, CA. Siegrist. Rev Med Suisse 2009;416-419

- coïncidence ou causalité ?
- confirmation difficile



Guide des vaccinations
Édition 2012

Direction générale de la santé
Comité technique des vaccinations

rogatoire, on doit rechercher des antécédents éventuels d'allergie à l'un des composants du vaccin (*voir Vaccination des personnes allergiques*).

Les allergies supposées, non avérées, ou les allergies chez des proches de la famille ne sont pas des contre-indications. Les seules contre-indications sont les réactions anaphylactiques chez la personne à vacciner.

Dans la plupart des cas, **la réaction anaphylactique** se manifeste dans les trente minutes qui suivent l'injection.

Tous les vaccins injectables sont susceptibles d'entraîner une éventuelle réaction anaphylactique immédiate; il est donc recommandé de disposer d'un traitement médical approprié à proximité.

World Health Organization
Western Pacific Region

Immunization Safety Surveillance
Guidelines for immunization programme managers
on surveillance of adverse events following immunization

Second Edition

In general, the more severe the reaction, the more rapid the onset. Most life-threatening reactions begin within 10 minutes of immunization. Keep the recipient under observation for at least 20 minutes after the injection.

Symptoms limited to only one system can occur, leading to delay in diagnosis. Biphasic reactions where symptoms recur 8 to 12 hours after onset of the original attack and prolonged

CDC | CDC Home | Search | Health Topics A-Z
MMWR
Recommendations and Reports
January 28, 2011 / 60(RR02);1-60

Recommendations of the Advisory Committee on Immunization Practices

vaccines for adolescents: human papillomavirus (HPV), MCV4, and Tdap (ZZ). Of particular concern among adolescents has been the risk for serious secondary injuries, including skull fracture and cerebral hemorrhage. Of 463 VAERS reports of syncope during January 1, 2005, to July 31, 2007, a total of 41 listed syncope with secondary injury with information on the timing after vaccination, and the majority of these syncope reports (76%) occurred among adolescents. Among all age groups, 80% of reported syncope episodes occur within 15 minutes of vaccine administration (additional information available at http://www.cdc.gov.gate2.inist.fr/vaccinesafety/concern/syncope.htm). Providers should take appropriate measures to prevent injuries if a patient becomes weak or dizzy or loses consciousness. Adolescents and adults should be seated or lying down during vaccination. Vaccine providers, particularly when vaccinating adolescents, should consider observing patients (with patients seated or lying down) for 15 minutes after vaccination to decrease the risk for injury should they faint (ZZ). If syncope develops, patients should be observed until the symptoms resolve.

Differences between a fainting attack and anaphylaxis

World Health Organization Western Pacific Region

Clinical features	Fainting	Anaphylaxis
Timing	Before, during or few minutes after injection	A short time, up to a few hours
Skin	Generalized pallor, cold clammy skin	Itching, generalized erythema, urticaria, swelling of lips, face, tingling around lips
Respiratory system	Normal breathing Shallow breathing	Tachypnoea, difficulty in breathing, wheezing, stridor, hoarseness, cyanosis, recession of intercostal spaces
Cardiovascular	Bradycardia, weak pulse, carotid pulse felt, hypotension may occur - reversed by supine position	Tachycardia, weak pulse, carotid pulse may be weak, hypotension - not reversed by supine position
GIT	Vomiting	Vomiting, diarrhoea, abdominal cramps
CNS	Faintishness, light-headedness relieved by supine posture	Anxiety and distress, loss of consciousness not relieved by supine posture
Panic attack - no hypotension, pallor, wheeze, or urticarial rash or swelling. May have flushing or blotchy skin.		

Food allergy in schools: A report on 56 cases observed by the allergovigilance network between 2005 and 2015

D. Sabouraud-Leclerc[a,*,b], E. Beaudouin[b,c], A. Chabbert[b], C. Larue[b], M.-D. Donnou[b], M. Boulègue[b], C. Nootens[b], D.-A. Moneret-Vautrin[b,c,d]

[a] Service de pédiatrie A, hôpital américain, 47, rue Cognacq-Jay, 51100 Reims, France
[b] Réseau d'allergovigilance, 15, rue du Bois-de-la-Champelle, 54500 Vandœuvre-lès-Nancy, France
[c] Service d'allergologie, centre hospitalier E. Durkheim, BP 590, 88021 Épinal cedex, France
[d] Université de Lorraine-Nancy, Nancy, France

Revue française d'allergologie 55 (2015) 456–462

Allergène	Nbre cas	Situations
Lait brebis/chèvre*	8	Restauration
Arachide	7 + 9	Restauration + Cour d'école
Soja	6	Restauration
Kiwi	4	Restauration
Lait vache*	2	Restauration
Sarasin	2	Restauration
Noix, noisette	2	Cour d'école
Autres	12	Restauration

Food allergy in schools: A report on 56 cases observed by the allergovigilance network between 2005 and 2015

Revue française d'allergologie 55 (2015) 456–462

Allergie connue : 21 cas.
Découverte d'allergie : 35 cas.

PAI : ok pour 21 cas allergiques.
Adrénaline : 4 (école), 15 (SAMU).
2 décès… malgré adrénaline…

Réaction	% cas	Particularités
Réaction 2 systèmes	71%	
Angioedème laryngé	16%	1 décès
Asthme aigu grave	5%	1 décès
Choc anaphylactique	5%	1 biphasique

En cas d'enfant à très haut risque allergique (allergènes à haut risque, seuil de réactivité faible déterminé lors d'un TPO, allergène ubiquitaire comme le lait, polyallergies alimentaires…), il peut préconiser le panier repas préparé par la famille, voire être amené, situation rare, à interdire la fréquentation de la restauration scolaire.

En cas d'allergie à l'arachide et/ou aux fruits à coques, il peut autoriser la fréquentation de la restauration scolaire sous couvert de lecture des menus, voire des fiches techniques bientôt disponibles par la famille.
En cas d'allergie à un fruit ou un aliment facile à identifier (kiwi, poisson si pas de réaction aux vapeurs…), il peut autoriser la cantine sous couvert de l'éviction simple.

Enfin, l'allergologue doit insister sur le caractère essentiel de l'éviction, « pas d'absorption, pas d'accident » : l'enfant doit être capable de refuser un aliment inconnu ou non autorisé dans toute circonstance. L'éducation thérapeutique de l'enfant et de sa famille doit être renforcée à chaque consultation.

Le médecin scolaire assure aussi un rôle essentiel, véritable maillon fort du PAI, pour une mise en place efficace et adéquate de celui-ci, en lien avec le personnel encadrant les enfants mais aussi les sociétés de restauration.

Anaphylaxie – traiter : quelle(s) molécule(s) ?

anti-histaminiques
remplissage
adrénaline
PLS
bêta2-mimétiques
corticoides

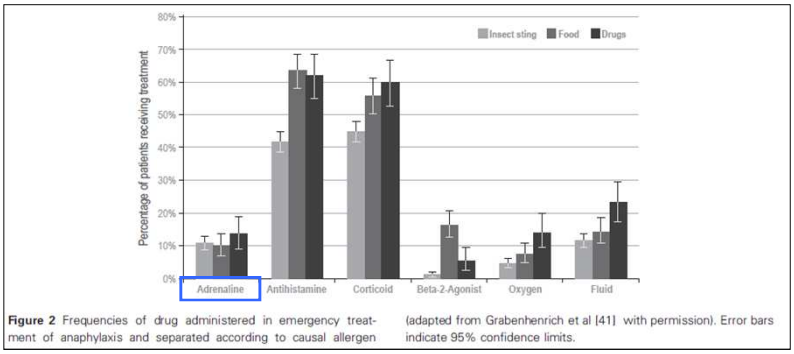


Figure 2 Frequencies of drug administered in emergency treatment of anaphylaxis and separated according to causal allergen (adapted from Grabenhenrich et al [41] with permission). Error bars indicate 95% confidence limits.

Allergy **69** (2014) 983–991 © 2014 John Wiley

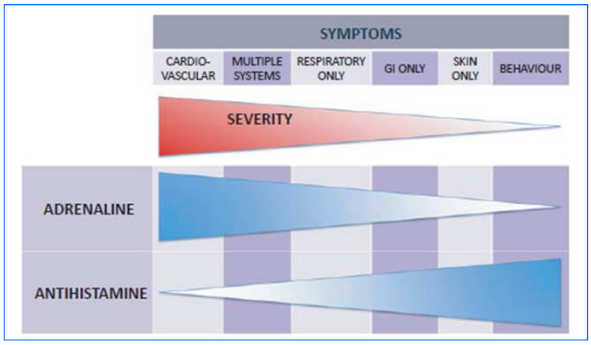
Allergy EUROPEAN JOURNAL OF ALLERGY AND CLINICAL IMMUNOLOGY Allergy 69 (2014) 1026–1045

Anaphylaxis: guidelines from the European Academy of Allergy and Clinical Immunology

1ère ligne
adrénaline

2ème ligne
retrait allergène
mise en condition
O2
remplissage
B2

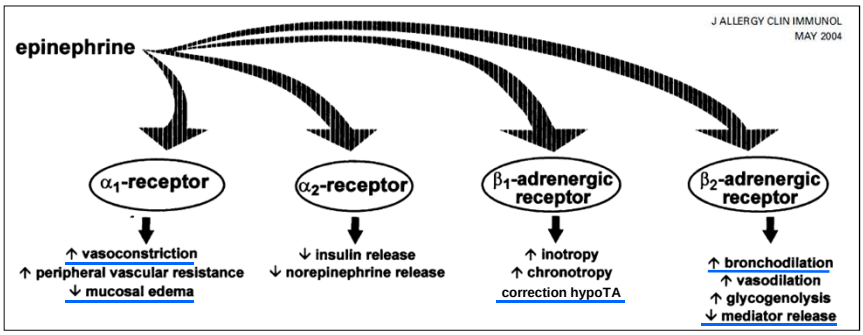
3ème ligne
anti-H1
corticoïdes



Adrénaline : qu'est-ce que c'est ?

o substance chimique prélevée « au-dessus du rein »
- épinéphrine *latin* (Abel, 1897)
- adrénaline *grec* (Takamine, 1901)

o modalités d'action



Adrenaline for the treatment of anaphylaxis: cochrane systematic review

Allergy 2009: 64: 204–212

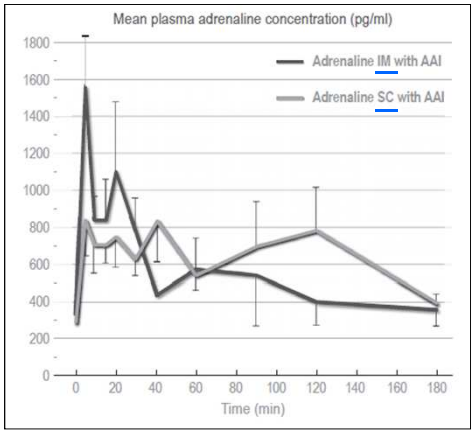
Methods: We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (*The Cochrane Library* 2007, Issue 1), MEDLINE (1966 to March 2007), EMBASE (1966 to March 2007), CINAHL (1982 to March 2007), BIOSIS (to March 2007), ISI Web of Knowledge (to March 2007) and LILACS

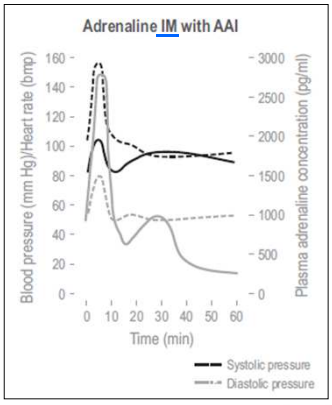
Results: We found no studies that satisfied the inclusion criteria.
Conclusions: On the basis of this review, we are unable to make any new recommendations on the use of adrenaline for the treatment of anaphylaxis. In the absence of appropriate trials, we recommend, albeit on the basis of less than optimal evidence, that adrenaline administration by intramuscular injection should still be regarded as first-line treatment for the management of

Although placebo-controlled trials of adrenaline in anaphylaxis would be unethical, it might be possible to conduct randomized controlled trials comparing two different doses of adrenaline or two different routes of administration of adrenaline, in addition to other standard-of-care treatments (58).

Adrénaline : comment l'utiliser ?

- o adrénaline non diluée (1mg/mL)
- o voie IM > SC (pas IV)
- o muscle vaste latéral (cuisse) > deltoïde





Allergy **69** (2014) 983–991 © 2014 John Wiley & Sons A/S.

o dose adaptée au poids de l'enfant
- 0,01 mg/kg (max = 0,5 mg)
- stylos auto-injectables : 0,15 / 0,3 / (0,5) mg

o à répéter à 5 min en cas d'échec

First-aid treatment of anaphylaxis to food: Focus on epinephrine

F. Estelle R. Simons, MD, FRCPC *Winnipeg, Manitoba, Canada*

J ALLERGY CLIN IMMUNOL
MAY 2004

TABLE II. Clinical dilemma: Selecting an appropriate epinephrine fixed-dose auto-injector for infants and children

	Body weight					
	≤5 kg	10 kg	15 kg	20 kg	25 kg	≥30 kg
Age at which this weight is 50th percentile	2 mo	14 mo	3 y	6 y	9 y	12 y
Optimal epinephrine dose	0.05 mg	0.1 mg	0.15 mg	0.2 mg	0.25 mg	0.3 mg
Is optimal dose available in an auto-injector?	No	No	Yes	No	No	Yes
Physician's dilemma,* if any	EpiPen Jr: 3-fold overdose	EpiPen Jr: 1.5-fold overdose	EpiPen Jr: optimal dose	EpiPen Jr: 1.3-fold underdose EpiPen: 1.5-fold overdose	EpiPen Jr: 1.7-fold underdose EpiPen: 1.2-fold overdose	EpiPen: optimal dose
Situation acceptable?	No	No	Yes, use	No	No	Yes, use

EAACI

Poids	7,5–25 kg	0,15 mg
	> 25–30 kg	0,30 mg
	?	0,50 mg

CSACI position statement: epinephrine auto-injectors and children < 15 kg

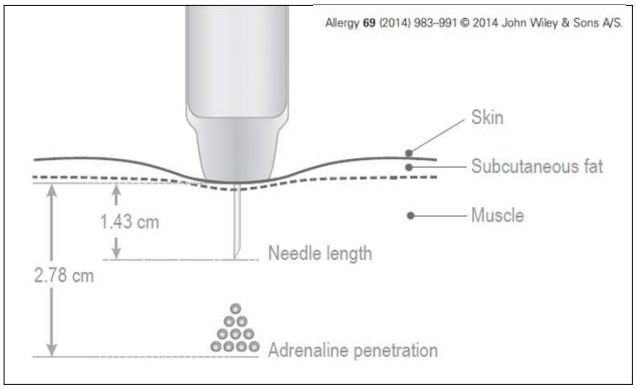
Halbrich *et al. Allergy, Asthma & Clinical Immunology* (2015) 11:20

CSACI: Canadian Society for Allergy and Clinical Immunology;

For the child weighing less than 15 kg, given the lack of a suitable alternative, we recommend prescribing the 0.15 mg epinephrine autoinjector. Adverse effects of an

We discourage the prescription of epinephrine ampoules and syringes. Fatal and near-fatal outcomes are related to delayed administration of epinephrine, which should be

« Dissection » d'une injection avec un stylo



o épaisseur du tissu sous-cutané du patient (morphotype,…)
o compression de la cuisse (technique, niveau de stress)
o vêtement porté

CURRENT OPINION

Epinephrine in anaphylaxis: doubt no more

T. Ted Song[a] and Phil Lieberman[b]

Children auto-injector	Manufacturer	Needle length (cm)
Adrenaclick 0.15 mg	Ameda Pharmaceuticals LLC	1.17
Anapen 0.15 mg	Lincoln Medical Ltd	1.27
Auvi-Q 0.15 mg	Sanofi-Aventis LLC	1.27
Emerade 0.15 mg	Namtell AB	1.6
Epipen 0.15 mg	Mylan Inc.	1.27
Jext 0.15 mg	ALK-Abello	1.3

Adult auto-injector	Needle length (cm)
Adrenaclick 0.30 mg	1.17
Anapen 0.30 mg	1.27
Auvi- Q 0.30 mg	1.57
Emerade 0.30 mg	2.5
Emerade 0.50 mg	2.5
Epipen 0. 30 mg	1.43–1.59[a]
Jext 0.30 mg	1.5

longueurs d'aiguille : 1,17 à 2,5 cm
o soldat portant tenue de protection chimique : 2,2 cm / adulte obèse : 2,5 cm

Pediatrics. 2009 Jul;124(1):65-70. doi: 10.1542/peds.2008-3388.

Epinephrine auto-injectors: is needle length adequate for delivery of epinephrine intramuscularly?

RESULTS: A total of 256 children were enrolled. Of these, 158 children weighed less than 30 kilograms and would be prescribed the 0.15 mg epinephrine auto-injector. Nineteen of these children (12%) had a skin to muscle surface distance of >(1/2)" and would not receive epinephrine intramuscularly from current auto-injectors. There were 98 children weighing >or=30 kilograms who would receive the 0.3 mg epinephrine auto-injector. Of these 98 children, a total of 29 (30%) had a skin to muscle surface distance of >(5/8)" and would not receive epinephrine intramuscularly.

1,27 cm

1,59 cm

Adrénaline : danger(s) à (ne pas) la faire ?

o constat = sous-utilisation, même en milieu médical
→ méconnaissance théorique ? technique ?
→ peur des effets secondaires / risques ?

o effets secondaires de la voie IM
- pâleur, tremblements, palpitations
- étourdissements, céphalées

o risques (théoriques)
- injection digitale : nécrose
- effets cardiaques ? (surdosage, IV)

« Un coup de stress »

2015 update of the evidence base: World Allergy Organization anaphylaxis guidelines

F. Estelle R. Simons[1*], Motohiro Ebisawa[2], Mario Sanchez-Borges[3], Bernard Y. Thong[4], Margitta Worm[5], Luciana Kase Tanno[6], Richard F. Lockey[7], Yehia M. El-Gamal[8], Simon GA Brown[9], Hae-Sim Park[10] and Aziz Sheikh[11]

Initial treatment [91–103]

Early injection of epinephrine in anaphylaxis, defined as initial injection before ED arrival, significantly reduced the likelihood of hospital admission, compared with initial epinephrine injection after ED arrival [92].

Epinephrine was injected before cardiac arrest in only 23 % of 92 individuals who experienced a fatal anaphylaxis episode [93].

In an observational study, data confirmed the safety of IM epinephrine injection, typically given through an epinephrine auto-injector: (adverse events 1 %, and no overdoses). In contrast, IV bolus injections were associated with significantly more adverse events (10 %) and overdoses (13 %) [99].

Anaphylaxis in the community: Learning from the survivors

F. Estelle R. Simons, MD, FRCPC, FAAAAI,[a] Sunday Clark, MPH, ScD,[b] and Carlos A. Camargo, Jr, MD, DrPH, FAAAAI[c] *Winnipeg, Manitoba, Canada, Pittsburgh, Pa, and Boston, Mass*
[J Allergy Clin Immunol 2009;124:301-6.)

TABLE VI. Why epinephrine autoinjectors were not used*

An antihistamine was used	38%
Did not receive a prescription for epinephrine autoinjector	28%
The allergic reaction was mild	13%
An asthma puffer was used	8%
Did not have epinephrine autoinjector available	8%
Unsure when to give the epinephrine injection	8%
In previous reaction no treatment was needed	8%
Afraid to inject epinephrine	6%
Quick recovery time (reaction went away fast)	4%
Concern about possible side effects of epinephrine	4%
Did not think autoinjector was needed because trigger was being avoided	3%
Epinephrine autoinjector was past expiry date	2%
Could not afford to purchase epinephrine autoinjector	1%
Was given prescription for autoinjector but did not purchase it	0.1%

Six Years of Epinephrine Digital Injections: Absence of Significant Local or Systemic Effects

Andrew E. Muck, MD, Vikhyat S. Bebarta, MD, Doug J. Borys, RPh, David L. Morgan, MD

Annals of Emergency Medicine Volume 56, no. 3 : September 2010

Results: There were 365 epinephrine injections to the hand identified for the 6-year period. Of these, 213 were digital injections, and 127 had follow-up. All patients had complete resolution of symptoms. None of the patients were hospitalized or received hand surgery consultation or surgical care. Significant systemic effects were not reported. Pharmacologic vasodilatory treatment was used in 23% (29/127) of patients. Ischemic effects were documented for 4 patients, and 2 of these had symptom resolution within 2 hours. All 4 patients received vasodilatory therapy and were discharged home, with complete resolution of symptoms.

Table 3. Summary of 4 cases (N=127) of digital ischemia in patients with digital epinephrine autoinjector exposure.

Case	Symptoms	Ischemic Symptoms	Treatment	National Poison Data System Clinical Outcome	Duration of Symptoms, h
1	Pain, blanching, numbness, poor capillary refill	"Turned blue," "blanched"	Phentolamine	Moderate	>8 and ≤24
2	Blanching, discoloration, numbness	"Gray," "severe vasoconstriction," poor capillary refill	Phentolamine	Moderate	<2
3	Blanching, poor capillary refill	"Ischemic," "cold"	Phentolamine and nitroglycerin	Minor	<2
4	Pain, blanching	"Cold," "necrosis"	Nitroglycerin	Moderate	>2 and ≤8

Epinephrine in Anaphylaxis: Higher Risk of Cardiovascular Complications and Overdose After Administration of Intravenous Bolus Epinephrine Compared with Intramuscular Epinephrine

J ALLERGY CLIN IMMUNOL PRACT
JANUARY/FEBRUARY 2015

Ronna L. Campbell, MD, PhD, M. Fernanda Bellolio, MD, MS, Benjamin D. Knutson, MD, Venkatesh R. Bellamkonda, MD,

TABLE II. Overdoses and adverse CV events associated with routes of epinephrine administration

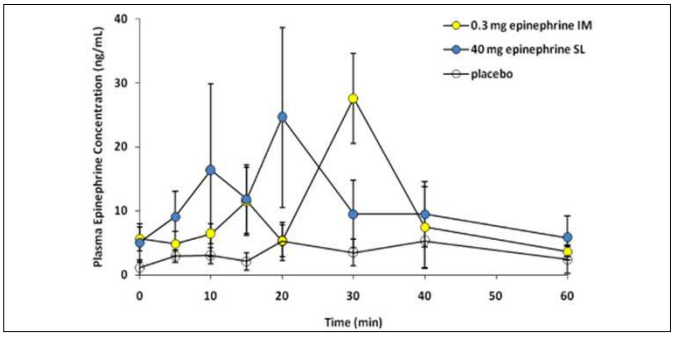
	IM autoinjector, N (%) (n = 245)	IM injection, N (%) (n = 71)	SC injection, N (%) (n = 12)	IV bolus, N (%) (n = 30)*	IV continuous infusion, N (%) (n = 4)
Overdose	0	0	0	4 (13.3)	0
Adverse cardiovascular event					
Arrhythmia	0	0	0	1 (3.3)	0
Ischemia	0	1 (1.4)	0	3 (10.0)	0
Stroke	0	0	0	0	0
Angina (no ischemia)	1 (0.4)	0	0	0	0
HTN	2 (0.8)	0	0	0	0

76/F	0.4 mg/IM	ED	Ischemia: the patient used a 0.3-mg epinephrine autoinjector before ED arrival for throat swelling and difficulty breathing, which began after ingestion of an unknown trigger; in the ED, the patient was noted to have posterior oropharyngeal edema and received 0.4 mg of IM epinephrine; after this, she developed chest tightness; here troponin T level was elevated (peak, 0.07 ng/mL)	HTN, HLD, previous MI and CABG	Lisinopril, HCTZ, atenolol, lovastatin
74/M	−/IM autoinjector	Home	Angina: the patient self-administered a 0.3-mg epinephrine autoinjector for a bee sting and developed chest tightness that had resolved before ED arrival; serial troponin T level measurements were negative	None	None
58/F	−/IM autoinjector	ED	HTN: the patient received 0.3 mg epinephrine via autoinjector for hives, angioedema, and dyspnea after taking a medication; her blood pressure increased to 224/134 mm Hg and normalized after approximately 10 min	HTN, HLD	Lisinopril, Atorvastatin
46/M	−/IM autoinjector	Home	HTN: the patient self-administered 2 doses of 0.3 mg epinephrine via autoinjectors, before arrival, for throat tightness, lightheadedness, and shortness of breath in response to an unknown trigger; in the ED, he was hypertensive, with a maximum blood pressure of 189/103 mm Hg; he had no history of HTN	None	None

CABG, Coronary artery bypass grafting; *ECG*, electrocardiogram; *EMS*, emergency medical services; *HCTZ*, hydrochlorothiazide; *HLD*, hyperlipidemia; *MI*, myocardial infarction.

Epinephrine (adrenaline) absorption from new-generation, taste-masked sublingual tablets: A preclinical study

J ALLERGY CLIN IMMUNOL
JANUARY 2013



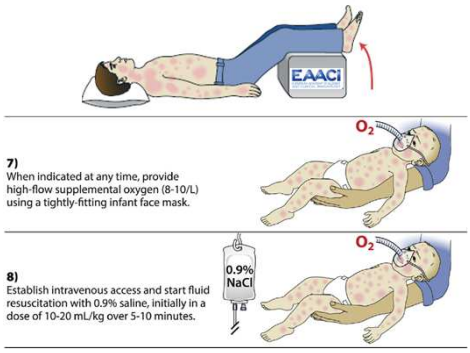
In this study we have shown that epinephrine is rapidly absorbed in the first 20 to 30 minutes after administration through either the sublingual or intramuscular route. The new-generation, taste-masked sublingual epinephrine tablets have similar bioavailability to epinephrine injected intramuscularly in the thigh. They are potentially suitable for phase I studies in human subjects and might eventually be useful for the first-aid treatment of anaphylaxis in community settings.

Autres points de la prise en charge

Second-line interventions

Trigger of the anaphylaxis episode should be removed

Patients experiencing anaphylaxis should be positioned supine with elevated lower extremities if they have circulatory instability, sitting up if they have respiratory distress, and in recovery position if unconscious



Stridor → nébulisations d'adrénaline +/- corticoïdes

Wheezing → nébulisations de B2

Autres molécules

Third-line interventions

Oral H1- (and H2)-antihistamines may relieve cutaneous symptoms of anaphylaxis

TABLE IV. Oral H_1-antihistamines have a slow onset of action

J ALLERGY CLIN IMMUNOL MAY 2004

	Healthy, fasting children, single dose*	
	t_{max} (h)	Onset of activity (h postdose)†
First-generation		
Chlorpheniramine	2.5 ± 1.5	1
Diphenhydramine	1.3 ± 0.5	1
Hydroxyzine	2.0 ± 0.9	NA
Second-generation		
Cetirizine	1.1 ± 0.8	0.7-1
Desloratadine	NA	NA
Fexofenadine	2.4 ± 0.2	1
Loratadine	1	1-2

Systemic glucocorticosteroids may be used as they may reduce the risk of late-phase 4-6H délai (même IV)

EVIDENCE-BASED CHILD HEALTH: A COCHRANE REVIEW JOURNAL
Evid-Based Child Health **8:4**: 1276–1294 (2013)
Published online in Wiley Online Library (onlinelibrary.wiley.com). DOI: 10.1002/ebch.1925

Glucocorticoids for the treatment of anaphylaxis (Review)

Authors' conclusions

We are, based on this review, unable to make any recommendations for the use of glucocorticoids in the treatment of anaphylaxis.

Glucocorticoids and Hospital Length of Stay for Children with Anaphylaxis: A Retrospective Study

(J Pediatr 2015;167:719-24).

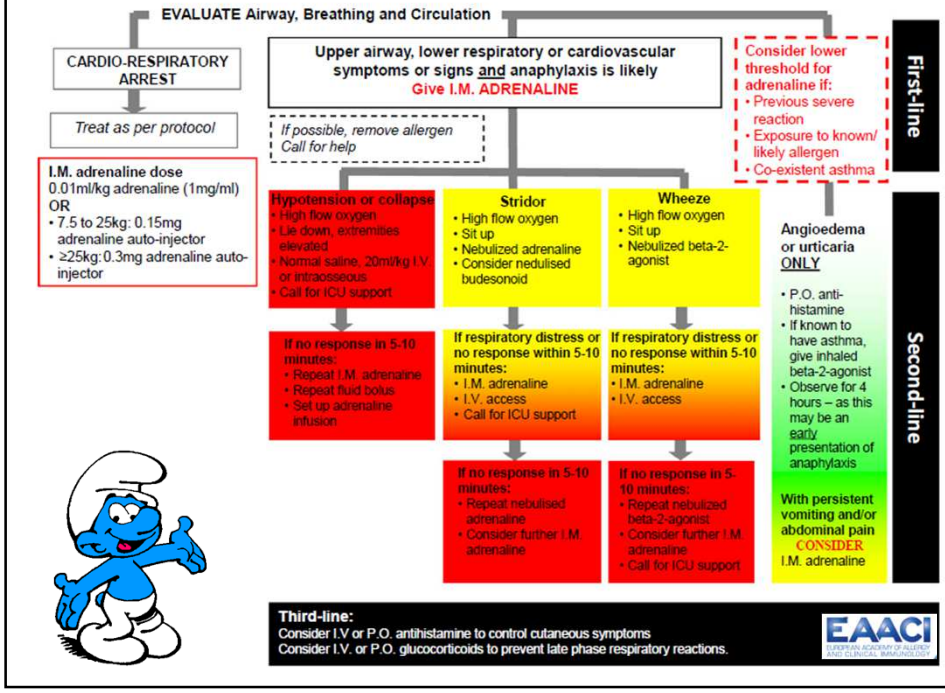
Kenneth A. Michelson, MD, Michael C. Monuteaux, ScD, and Mark I. Neuman, MD, MPH

Objective To evaluate whether glucocorticoid administration is associated with improved outcomes in children with anaphylaxis.

Study design We included children from the Pediatric Health Information System database who were diagnosed with anaphylaxis at 35 US children's hospitals between 2009 and 2013. Patients were stratified by disposition from the emergency department (ED), either hospitalized or discharged. We evaluated the association between glucocorticoid administration and prolonged length of stay (LOS), defined as hospital stay ≥2 days, and subsequent epinephrine administration among hospitalized children. Among discharged children, we assessed the association between glucocorticoid administration and ED revisits within 3 days. Analyses were adjusted for illness severity using ordering of laboratory tests, medications, oxygen, intravenous fluids, and admission to the intensive care unit.

Results Among 5203 children hospitalized with anaphylaxis, 424 (8.2%) had prolonged LOS. Glucocorticoid administration was inversely associated with prolonged LOS (aOR, 0.61; 95% CI, 0.41-0.93) and with subsequent epinephrine use (aOR, 0.63; 95% CI, 0.43-0.84) among hospitalized children. Glucocorticoid administration was not associated with the odds of a 3-day revisit (aOR, 1.01; 95% CI, 0.50-2.05) among discharged patients.

Conclusion The use of glucocorticoids was inversely associated with prolonged LOS among children hospitalized with anaphylaxis, but was not associated with 3-day ED revisits among discharged children. These findings support the use of glucocorticoids in children hospitalized with anaphylaxis. *(J Pediatr 2015;167:719-24).*



Suivi immédiat

Correction des signes

qqes minutes : érythème, bronchospasme (B2), hypoTA
qqes heures : tachycardie, angioedème

Monitoring and discharge

Patients who presented with respiratory compromise should be closely monitored for at least 6–8 h, and patients who presented with circulatory instability require close monitoring for 12–24 h

Causes d'échec

SC<<<IM, retrait précoce de l'aiguille (< 10 s)
stylo d'adrénaline périmé (à nuancer…)
vasoplégie avec hypovolémie relative (décubitus, jambes levées, remplissage)
réaction biphasique

… et parfois évolution spontanément défavorable…

The emergency anaphylaxis kit: How are we going to educate patients?

E. Bidat *, M. El Zoobi, G. Benoist, C. Feuillet Dassonval

Service de pédiatrie, hôpital Ambroise-Paré, AP–HP, 9, avenue Charles-de-Gaulle, 92104 Boulogne cedex, France

Revue française d'allergologie 54 (2014) 203–206

La surveillance « hospitalière » au décours d'une injection est inscrite dans les recommandations [6]. L'expérience quotidienne montre, que trop souvent, l'adrénaline n'a pas été utilisée car la surveillance n'était pas souhaitée ou impossible ! Nous insistons maintenant sur l'importance de pratiquer l'injection d'adrénaline encore plus tôt s'il n'y a pas d'accès aux soins rapides. Chez certains patients, que nous connaissons depuis longtemps, éduqués, nous acceptons qu'ils n'effectuent pas une surveillance hospitalière systématique, mais uniquement si trois conditions sont réunies : les signes doivent disparaître rapidement après l'injection, un deuxième stylo d'adrénaline doit être disponible, et un adulte référent doit être présent. Ceci est hors recommandations, mais nous paraît préférable à la non-injection d'adrénaline. L'évolution de l'indication de l'adrénaline va de toute façon nous obliger à redéfinir quand une surveillance hospitalière est nécessaire.

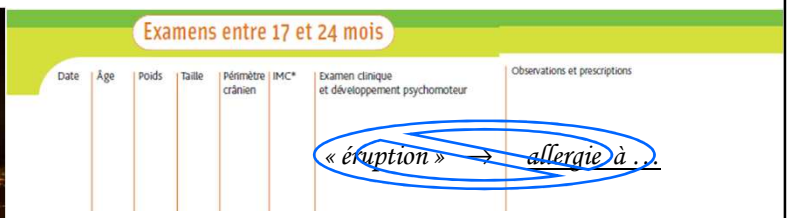
Anaphylaxie – traiter : être « acteur » de soins

Urgence = adrénaline
En cas de doute → donner de l'adrénaline !

Après **avoir débuté** le traitement d'urgence de la suspicion d'anaphylaxie, **il est important de :**

- noter les symptômes de l'épisode anaphylactique[1] venant de se dérouler
- noter l'heure de début de survenue des symptômes
- noter les circonstances ayant précédé le début des symptômes pour aider à identifier un ou des possibles facteurs déclenchants[2]

HAS



Décrire la sémiologie : urticaire, wheezing,…

Noter la chronologie : par rapport à une prise d'aliment / médicament

Liste des aliments ingérés (< 4H)

Garder les étiquettes des produits inconnus / suspects

ne pas avoir d'a priori…

Dosage de la tryptase

HAS

→ réaliser un dosage sanguin de la tryptase[3] le plus tôt possible. Un deuxième échantillon est à prélever idéalement 1 à 2 heures après le début de l'épisode sans dépasser 4 heures

L'augmentation franche de la concentration de tryptase sérique (> 25 µg, L-1) est en faveur d'un mécanisme anaphylactique

Usefulness and Limitations of Sequential Serum Tryptase for the Diagnosis of Anaphylaxis in 102 Patients

Int Arch Allergy Immunol 2013;160:192–199

Table 4. Serum tryptase at different time points and percentage of patients with elevated tryptase

	Mean, µg/l	SD, µg/l	Total patients[1]	n[2]
T1 (1–2 h)	19.3	15.1	58 (63.7)	91
T2 (4–6 h)	10.2	8.5	20 (46.6)	45
T3 (12–24 h)	7.3	4.7	9 (33.3)	27
TB (basal)	4.5	2	0	100[3]

retour à la valeur de base en 12-24H
diagnostic rétrospectif…

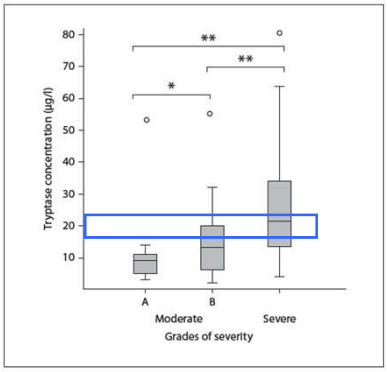


Fig. 3. Tryptase concentration during anaphylaxis (T1) depending on severity. Results are expressed as the median and IQR.

Avant de faire sortir le patient des urgences…

→ prescrire un traitement par seringue auto-injectable d'adrénaline[4]

HAS

→ remettre des informations écrites sur le mécanisme et les symptômes de la réaction anaphylactique, y compris le risque de réaction biphasique (en deux temps)

Un début d'éducation thérapeutique…

HAS

- remettre des informations écrites sur la conduite à tenir en cas de réaction anaphylactique (utiliser la seringue auto-injectable d'adrénaline et appeler le SAMU – centre 15 ou le 112
- remettre des informations écrites sur l'utilisation correcte de la seringue auto-injectable d'adrénaline (comprenant une démonstration de l'utilisation) et quand l'utiliser
- remettre des informations écrites sur la stratégie d'éviction du ou des allergènes suspectés
- adresser une information écrite sur l'épisode anaphylactique suspecté au médecin traitant et à l'allergologue le plus rapidement possible

Plan d'action en cas de réaction accidentelle dans l'allergie alimentaire chez l'enfant : position du groupe de travail « allergie alimentaire » sous l'égide de la Société française d'allergologie

A. Deschildre et al./Revue française d'allergologie xxx (2014) xxx–xxx

ALLERGIES ALIMENTAIRES DE L'ENFANT = PLAN D'ACTION EN URGENCE

ENFANT :
POIDS : kg
DATE:
AGE :
ALIMENTS A EXCLURE :

PENDANT OU JUSTE APRES AVOIR MANGÉ

1) INJECTER LE *JEXT* (FACE EXTERIEURE DE LA CUISSE)

RÉACTION SÉVÈRE

- Ma voix change
- J'ai du mal à parler
- Je respire mal, je siffle, je tousse
- J'ai très mal au ventre, je vomis
- Je me gratte les mains, les pieds, la tête
- Je me sens mal ou bizarre, je fais un malaise

ATTENTION ! CELA PEUT ÊTRE GRAVE
FAITES POUR MOI RAPIDEMENT LES BONS GESTES

2) APPELER LE SAMU (15 ou 112)
3) AIDER À RESPIRER :
- β2 mimétique courte action : ....
à répéter toutes les ..... minutes si besoin.
- corticoïde oral : ....

RÉACTION LÉGÈRE

- Ma bouche pique ou gratte, mon nez coule
- Mes lèvres gonflent
- J'ai des plaques rouges qui grattent
- J'ai un peu mal au ventre et envie de vomir

MAIS JE PARLE ET RESPIRE BIEN

1) ANTIHISTAMINIQUE: .....
2) SURVEILLER L'ENFANT
prévenir les parents
3) SI AGGRAVATION

Traiter comme une réaction sévère

L'adrénaline sauve la vie, ma trousse doit toujours être avec moi

prescrire un stylo auto-injectable

Rédiger l'ordonnance

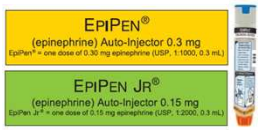
(<?) 7,5–25 kg → 0,15 mg > 25–30 kg → 0,30 mg EAACI
2 stylos
ne pas oublier le reste de la trousse d'urgence

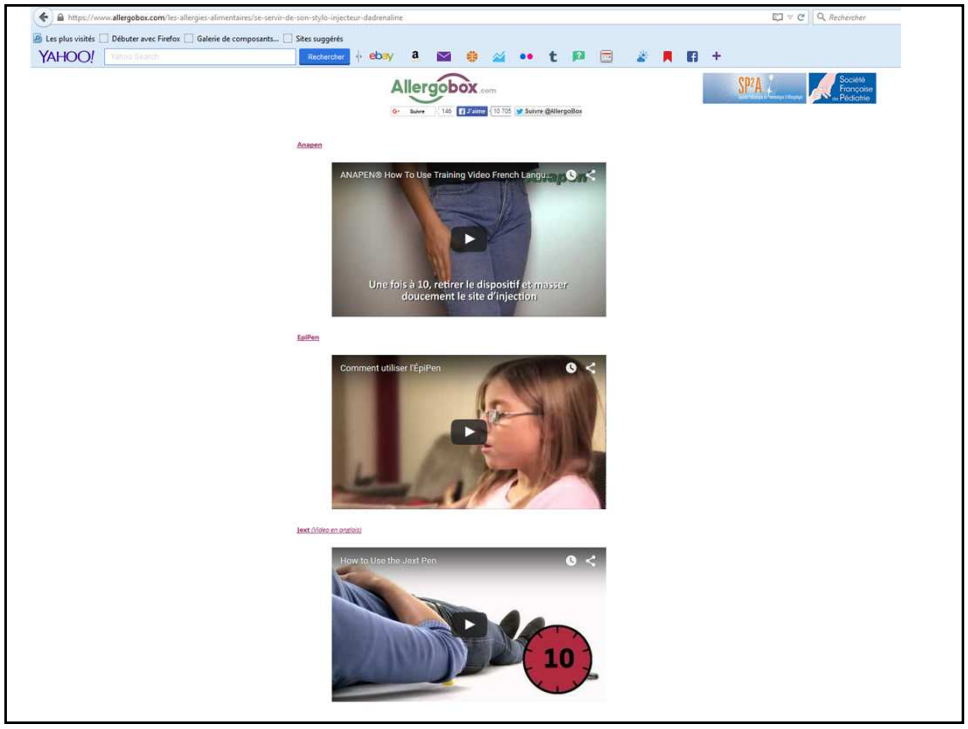
Démonstration par le prescripteur !

avoir un « trainer » et le manipuler en consultation
au travers des vêtements ou directement à la peau
appuyer fermement, maintenir 10 sec, masser 10 sec

Conseils aux familles

conservation à T° ambiante à l'abri de la lumière
regarder la fenêtre d'inspection de la solution (incolore)
péremption (>12-)18 mois, *même si…*





Training of trainers on epinephrine autoinjector use

Mustafa Arga[1], Arzu Bakirtas[1], Ferhat Catal[2], Oksan Derinoz[3], Koray Harmanci[4], Cem H. Razi[5], Salih Ergöcen[6], M. Sadik Demirsoy[1] & Ipek Turktas[1]

Pediatric Allergy and Immunology **22** (2011) 590–593 © 2011 John Wiley & Sons A/S

Table 3 Pre- and post-educational assessment of epinephrine autoinjector use (n = 151)*

	Pre-education	Post-education
Primary study parameter		
Number of correct use (%)	35 (23.2)	112 (74.2)
Secondary study parameters		
Total score (mean ± s.d.)	3.49 ± 1.14	4.66 ± 0.65
Time (s) to administer (mean ± s.d.)	28.01 ± 6.22	19.62 ± 5.01
Read instructions of the autoinjector (%)	138 (91.4)	44 (29.1)
Assessment steps		
Removed gray cap (%)	134 (88.7)	146 (96.7)
Select outer thigh as body part (%)	129 (85.4)	149 (98.7)
Placed black end into outer thigh (%)	100 (66.2)	142 (94.0)
Pressed to activate (%)	91 (60.3)	138 (91.3)
Held pen for more than 5 s (%)	73 (48.3)	124 (82.1)
Self-injection into thumb (%)	55 (36.4)	11 (7.3)

*p < 0.001 for all parameters in post-compared to pre-education

Assessment of self-administered epinephrine during a training

Anna Hellstrom[1]*, Karin Eriksson[2]*, Eva O Ehraimsson[1,4], Jan Svedmyr[3], Magnus P Borres (magnus@borres.se)[1,5,6]
1 Department of Pediatrics, Falu Hospital, Falun, Sweden

©2011 The Author(s)/*Acta Paediatrica* ©2011 Foundation Acta Paediatrica 2011 **100**, pp. e34–e35

15 enfants de 7 à 18 ans
administration d'un vrai stylo d'adrénaline

Table 1 Feelings about using Self-Administrated Epinephrine answered (A) before injection, (B) 30–60 min after injection and (C) 2 weeks after injection

	A Before	B After	C 2 weeks after
Very anxious	1	0	0
Anxious	6	1	1
Neither anxious or calm	1	0	2
Calm	4	5	0
Very calm	3	9	9
Total	15	15	12

E2 : palpitations, tremblements
comité éthique, aucun refus de parents

Adresser à l'allergologue…

→ adresser le patient vers une consultation d'allergologie pour une prise en charge diagnostique, thérapeutique et éducationnelle ≈ 4 semaines sauf besoin ETP/réassurance

Anaphylaxie :
THM : que doit savoir le pédiatre ?

Reconnaître

association de signes cutanés et respiratoires, aggravation rapide
douleurs abdominales après exposition à un allergène

doser la tryptase au moindre doute (diagnostic rétrospectif au SAU)
bien préciser la chronologie et la sémiologie des faits

Traiter

si 1 seul traitement = adrénaline IM
ne pas tarder ni ne jamais hésiter à administrer de l'adrénaline

prescrire des stylos auto-injecteurs à la sortie et débuter l'ETP
adresser à l'allergologue pour diagnostics étiologique et éducatif