Arepege – avril2014

Délais diagnostiques en pédiatrie

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Introduction

Soins sub-optimaux, diagnostic mishap

- 44 000 à 98 000 décès /an / USA imputables à des erreurs médicales
- 3ème à 8ème place des causes de décès

Table 1. Types of Adverse Events and Proportion of Events Involving Negligence.

Type of Event	No. of Events in Sample	Weighted Proportion of Events*		
		In Population	Due to Negligence	With Serious Disability
Nonoperative				
Drug-related	178	19.4	17.7‡	14.1‡
Diagnostic mishap	79	8.1	75.2†	47.0‡
Therapeutic mishap	62	7.5	76.8†	35.4
Procedure-related	88	7.0	15.1	28.8
Fall	20	2.7	—	—
Fracture§	18	1.2	—	—
Postpartum¶	18	1.1	—	—
Anesthesia-related	13	1.1	—	—
Neonatal	29	0.9	—	—
System and other	29	3.3	35.9	36.0
All	534	52.3	37.2	25.3

THE NATURE OF ADVERSE EVENTS IN HOSPITALIZED PATIENTS

Results of the Harvard Medical Practice Study II

Lucian L. Leape, M.D., Troyen A. Brennan, M.D., J.D., M.P.H., Nan Laird, Ph.D.,

N Engl J Med 1991

Faire un diagnostic
plus difficile en pédiatrie?

(1) Symptoms reporting

Preverbal children:

- cannot identify, report or describe their symptoms
- are dependent on the knowledge and practices / 3 rd persons (parents and physician)

Teenagers:

- tend not to report their symptoms spontaneously

Faire un diagnostic
plus difficile en pédiatrie?

(2) Symptoms and signs performance

Preschool children can of ten appear very ill while having benign conditions.

Frequently have chronic symptoms (e.g., gastroesophageal reflux) or recurrent polymorphic acute episodes (viral respiratory or intestinal infections).

This makes warning symptoms (such as f ever, pain, vomiting, anorexia or dyspnea) of severe diseases less ...

Faire un diagnostic
plus difficile en pédiatrie?

(3) Low level of evidence of diagnosis procedures

because of the dif f iculties inherent in clinical research in children :

- reluctance of parents and physicians to include them in prospective studies,
- dif f iculties in perf orming reference tests requiring invasive diagnostic investigations,
- the limited size of the pediatric market, which discourages industrial f unding of studies.

Tests dicignostiques

moins vcilidés en pédicitrie ?

Proccilcitonine et pneumopcithie : études interventionelles

Adultes

Christ-Crciin et cil. Am J Respir Crit Ccire Med 2006
Briel et cil. Arch Intern Med 2008
Schuetz et cil. JAMA 2009
Burkhcirdt et cil. Eur Respir J 2010
Nobre et cil. Am J Respir Crit Ccire Med 2008
Hochreiter et cil. Crit Ccire 2009
Stolz et cil. Eur Respir J 2009
Boucidmci et cil. Lcincet 2010

Pédicitrique

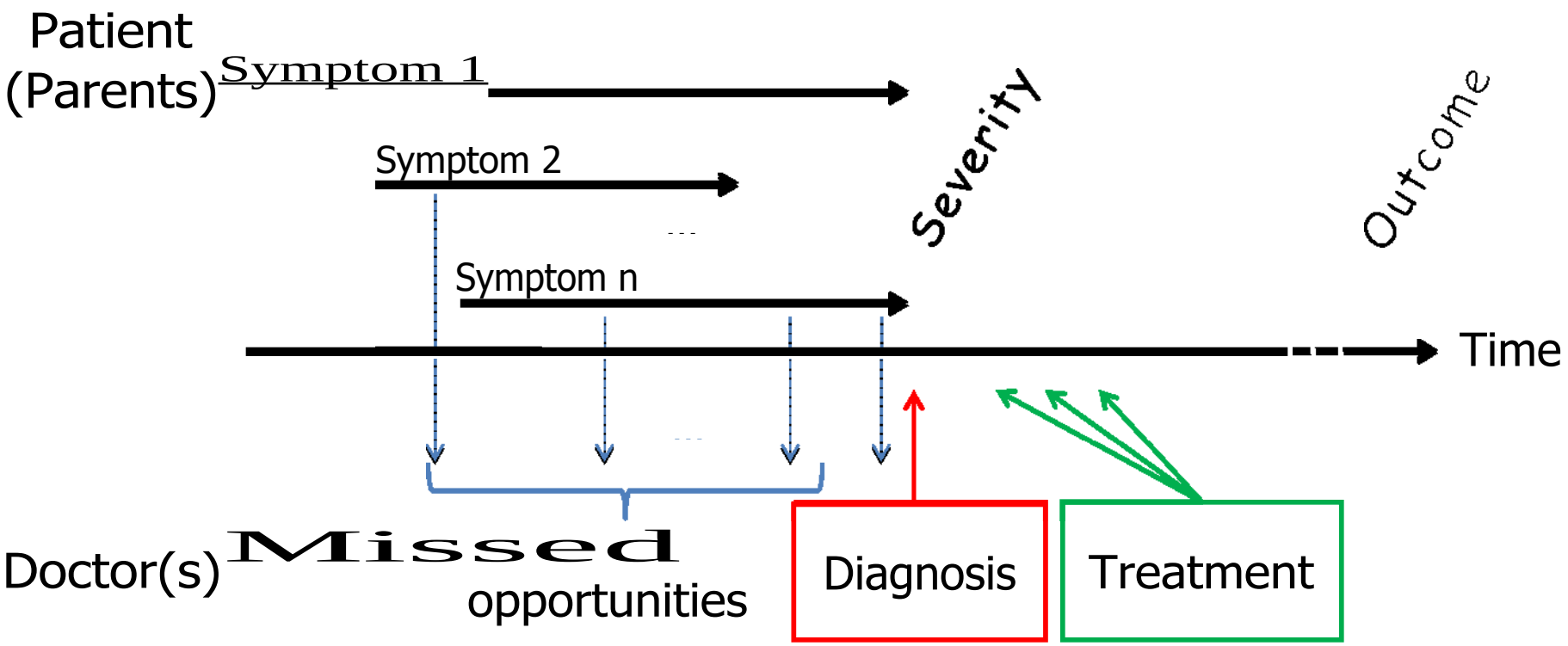
Esposito et cil. Respir Med. 2011

Diagnostic
en pédiatrie vs chez adulte

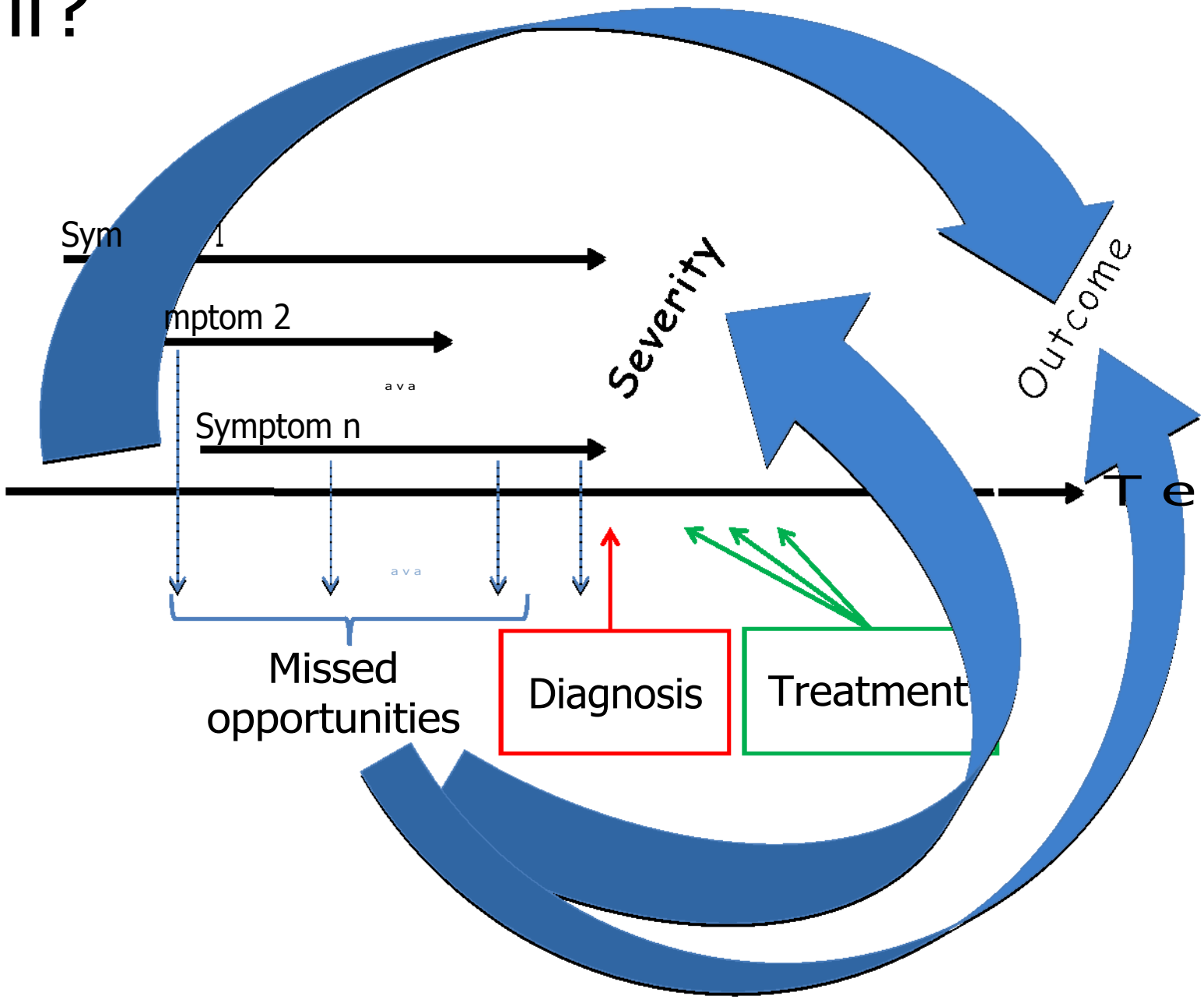
Question :Trouvez-vous que faire un diagnostic est plus difficile en pédiatrie qû en médecine adulte ?

- OUI :bras droit levé
- NON: bras gauche levé
- SANS AVIS: aucun bras levé
- ON TROUVE LA QUESTION NULLE: 2 bras levés

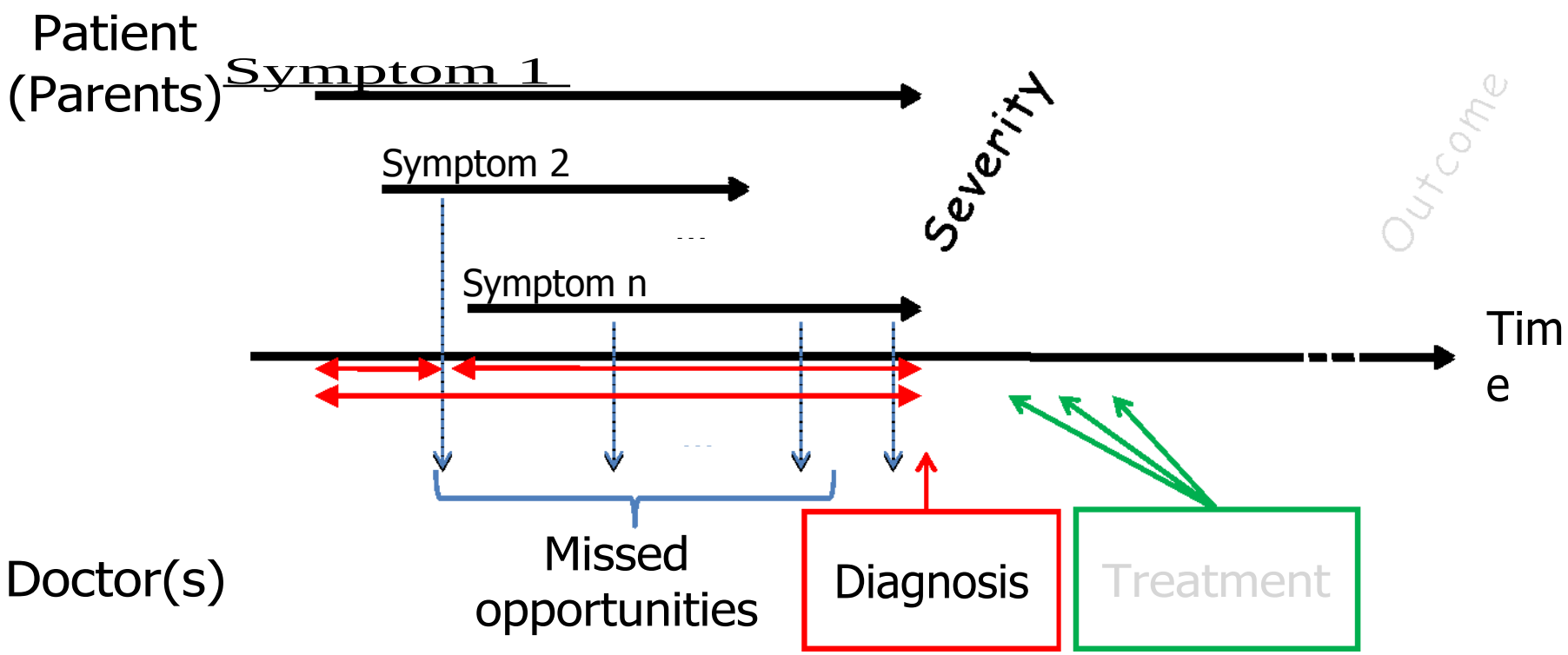
Paradigm


Patient
(Parents)
Symptom 1
Symptom 2
...
Symptom n
Severity
Outcome
Time
Doctor(s)
Missed
opportunities
Diagnosis
Treatment

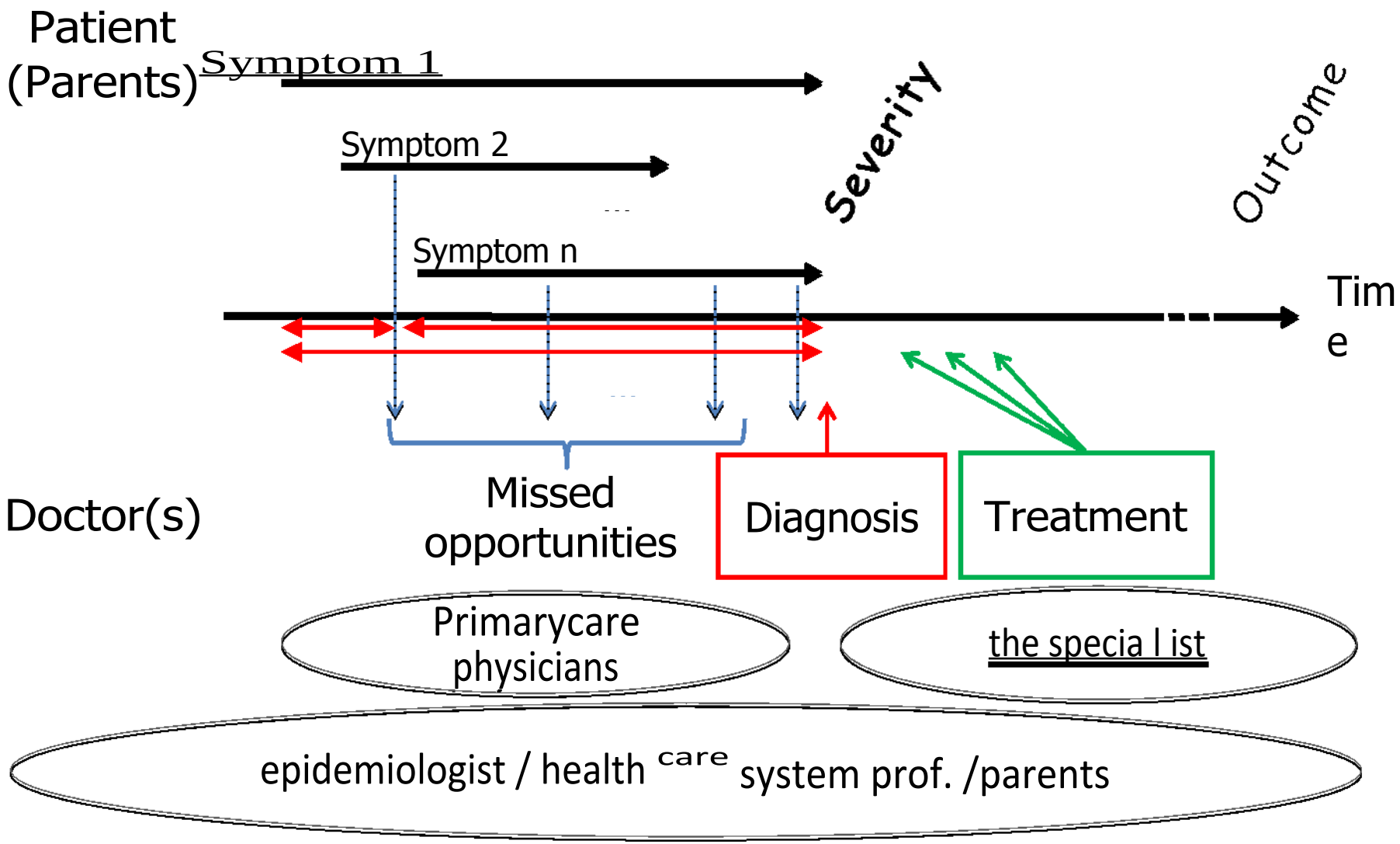
What if?


Patient
(Parents)
Sym
1
mptom 2
Symptom n
Severity
Outcome
Missed
opportunities
Diagnosis
Treatment
Doctor(s)

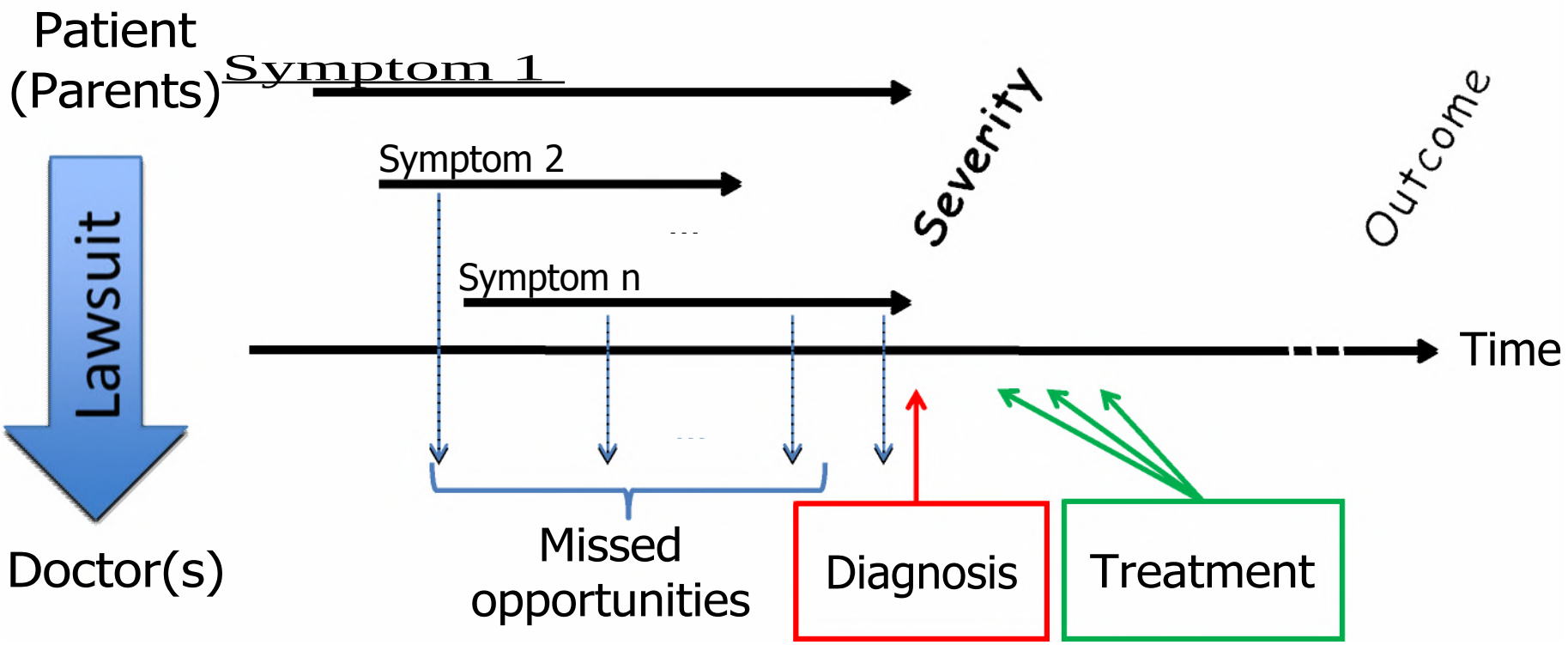
Diagnosis delay(s)



Who is asking?



Last but not least

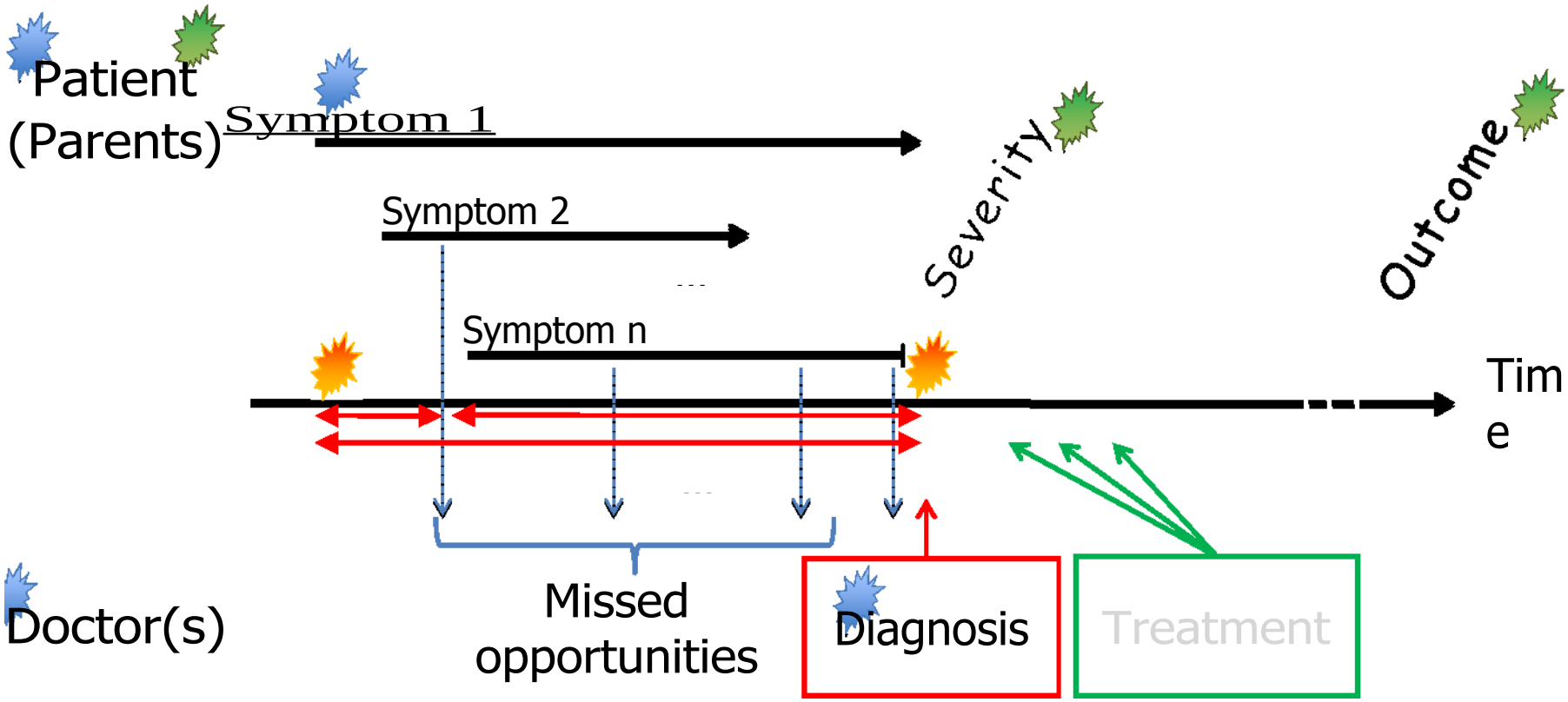


The agenda

working on diagnosis delays

1. Severe disease
2. Delays are long
3. Relationship between diagnosis delays / outcomes
4. Determinants of long delays
5. Parental and medical education programs
6. Implement them
7. Reduce diagnosis delays and then improve outcomes
8. (Reduce lawsuit)

The devil is in the details



Risks of bias and variation:

recruitment measurement confusion

Délais diagnostiques

qualité du reporting des études en pédiatrie

Qualité du reporting
identification des articles

50 derniers articles en partant de 2011

Search strategy

(((pitfalls[Title] OP, missed[Title]) OP, delay*[Title]) OP, interval*[Title]) AND diagnos* [Title/Abstract] NOT ((((((gene[Title/Abstract] OP, chromosome[Title/Abstract]) OP, antenatal[Title/Abstract]) OP, review[Publication Type]) OP, Case P,eports [Pub l ication Type]) OP, editorial [pub l ication type]) OP, comment [pub l ication type]) OP, letter[publication type]).

Limite : « child »

Exhaustivité : vérification manuelle sur une année

Exclusion: diagnostic anténatal, case report, brief report

Double lecture indépendante + 3 ème auteur si désaccord

Launay E et al. *Arch Dis Child 2014*

The devil is in the details

1. Studied population

Key points potentially associated with risks of bias and variation:

-sub-groups at risk of extreme diagnosis delay

-cases identification

-list of symptoms —> trigger diagnosis procedure

-partial verification bias

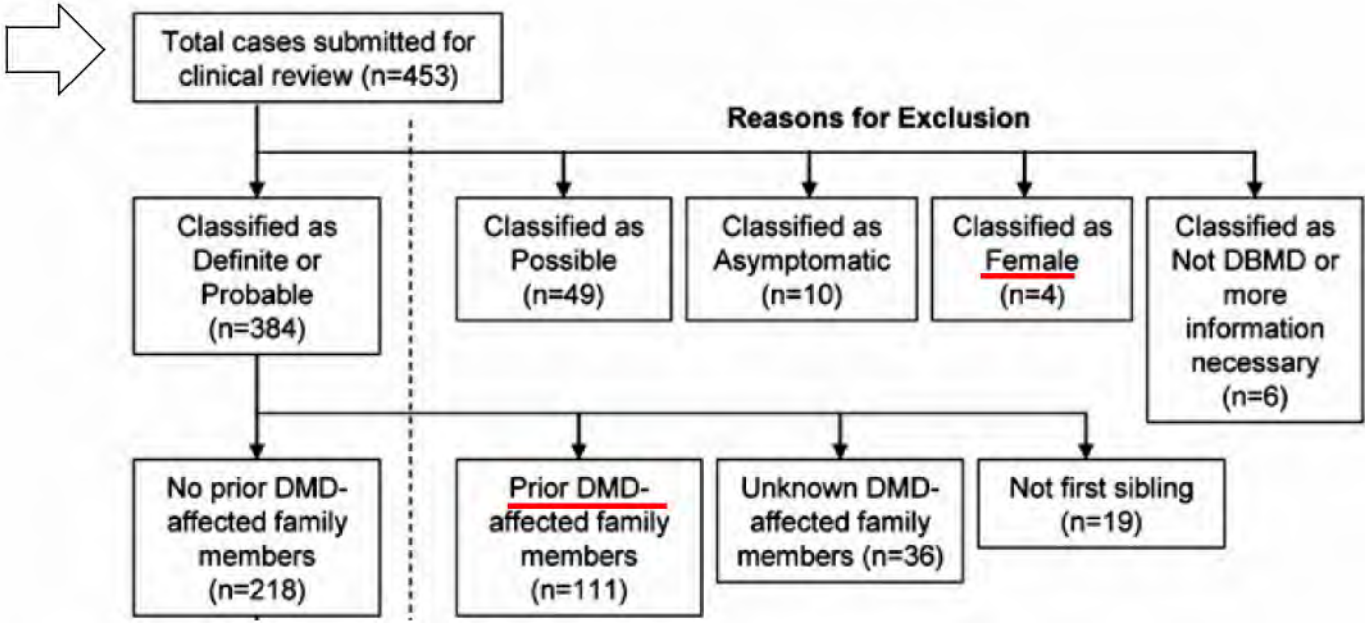
Studied population

Sub-groups at risk of extreme diagnosis delay

Delayed Diagnosis in Duchenne Muscular Dystrophy: Data from the Muscular Dystrophy Surveillance, Tracking, and Research Network

J Pediatr 2009;155:380-5,

Duchenne muscular dystrophy (DMD) is the most common muscular dystrophy in children, occurring in 1 of every 3500 male newborns.[1] DMD is an X-linked recessive disorder; approximately 30% of cases arise from spontaneous mutations in the dystrophin (*DMD*) gene.[2]



Studied population

Sub-groups at risk of extreme diagnosis delay

Interval between onset of symptoms and diagnosis of medulloblastoma in children: distribution and determinants in a population-based study

Patients

We did not include patients referred from other regions or countries, or those being monitored because of a specific medical (history of radiation therapy or chemotherapy) or genetic (Turcot, Gorlin, or Li-Fraumeni syndromes) predisposition known before diagnosis.

Brasme Eur J Pediatr 2011

Studied population

Sub-groups at risk of extreme diagnosis delay

Documented Delays in the Diagnosis of Retinoblastoma

Ann Ophthalmol 1985;17:731–732

Because most families with a positive history of retinoblastoma are appropriately forewarned of increased risk and are therefore more keenly aware of their child's symptoms, they were considered separately in all categories.

	Positive Family History	Negative Family History
Parents who referred to local MD within 1 wk (%)	67	53
Mean time to referral in remaining parents	5 wks	11 wks
Local MD who referred to ophthalmologist within 1 wk (%)	75	54
Mean time to referral in remaining local MD	19 wks	19 wks

Studied population

Sub-groups at risk of extreme diagnosis delay

DELAYED DIAGNOSIS OF RETINOBLASTOMA

Bull. Soc. belge Ophtalmol., **278**, 37-41, 2000.

PATIENTS AND METHODS

Seven children were found to have a bilateral retinoblastoma, five were diagnosed at presentation, the other two at follow-up. Twenty-six children had a unilateral retinoblastoma.

Studied population

Sub-groups at risk of extreme diagnosis delay

Delayed Diagnosis of Retinoblastoma: Analysis of Degree, Cause, and Potential Consequences

Pediatrics 2002;109(3)

Methods. A retrospective chart review was conducted of 64 consecutive patients who presented to the Memorial Sloan-Kettering Cancer Center with newly diagnosed retinoblastoma. Seven patients with a positive family history were excluded.

Studied population
Cases identification

Delayed diagnosis in type 1 diabetes mellitus

Arch Dis Child 2009;**94**:151–152.

METHODS

Children diagnosed with T1DM between January 2004 and June 2007 at Children's Hospital were identified from our paediatric diabetic database (Twinkle).

Question :Est-ce que la qualité du reporting est bonne ?

- OUI :bras droit levé
- NON: bras gauche levé
- SANS AVIS: aucun bras levé
- VOUS AVEZ TRICHÉ* : 2 bras levés

*impossible de publier dans une aussi prestigieuse revue avec un tel biais

Studied population

Cases identification: population-based

Suboptimal care in the initial management of children who died from severe bacterial infection: A population-based confidential inquiry*

Elise Launay, MD; Christèle Gras-Le Guen, MD, PhD; Alain Martinot, MD, PhD; Rémy Assathiany, MD;

Pediatr Crit Care Med 2010; 11:469–474

Pediatric care in this area is provided by one university hospital center (in Nantes), four general hospitals, pediatricians in private practice (29 per 100,000 children), general practitioners (145 per 100,000 inhabitants), and two call centers for medical emergencies that can send emergency mobile medical teams (including physicians specialized in emergency medicine) to patients' homes. The organization of care in this geographic zone called for all children >3 months old and requiring hospitalization for SBI to be transferred to the Nantes University Hospital Center.

Comment on fait en pratique ?

Insuffisant ?

Studied population

Cases identification: population-based

Suboptimal care in the initial management of children who died from severe bacterial infection: A population-based confidential inquiry*

Elise Launay, MD; Christèle Gras-Le Guen, MD, PhD; Alain Martinot, MD, PhD; Rémy Assathiany, MD;

Pediatr Crit Care Med 2010; 11:469–474

We considered for inclusion all patients who died in the pediatric intensive care department of the Nantes University Hospital Center with at least one of the following discharge codes, or words in their electronic medical file: meningitis, purpura fulminans, septicemia, or septic shock. Also considered for possible inclusion were all children who died at home with fever, according to the records of the emergency medical call centers.

To assess the exhaustiveness of our study, our population was compared with the anonymized national cause of death database (CépiDc) (17) from which we extracted all deaths related to SBI from 2000 through 2005 (data were not available for 2006 at the time of our study) of children aged 0 to 14 yrs who lived in the study area. The following International Statistical Classification of Diseases and Related Health Problems, Revision 9 codes listed as the principal cause of death were used: A00–09, A30–49, B95, B96, B99, G00, G01, G03, G06, J15, J86.9, and R57.8. We also questioned the local database manager directly in suspicious cases.

Studied population

Cases identification: population-based

Interval between onset of symptoms and diagnosis of medulloblastoma in children: distribution and determinants in a population-based study

We performed a multicentre historic cohort study that aimed to include all the paediatric medulloblastomas diagnosed in one French region (Ile-de-France, the greater Paris metropolitan region) from 1990 to 2005. During this period, in accordance with the regional organisation of health care, these children underwent surgery at one of the four neurosurgery departments, followed by medical treatment in one of the two paediatric oncology departments in the region. Potentially eligible patients were identified from lists of diagnostic codes from the four neurosurgery departments.

Brasme Eur J Pediatr 2011

Studied population

Cases identification: near population-based

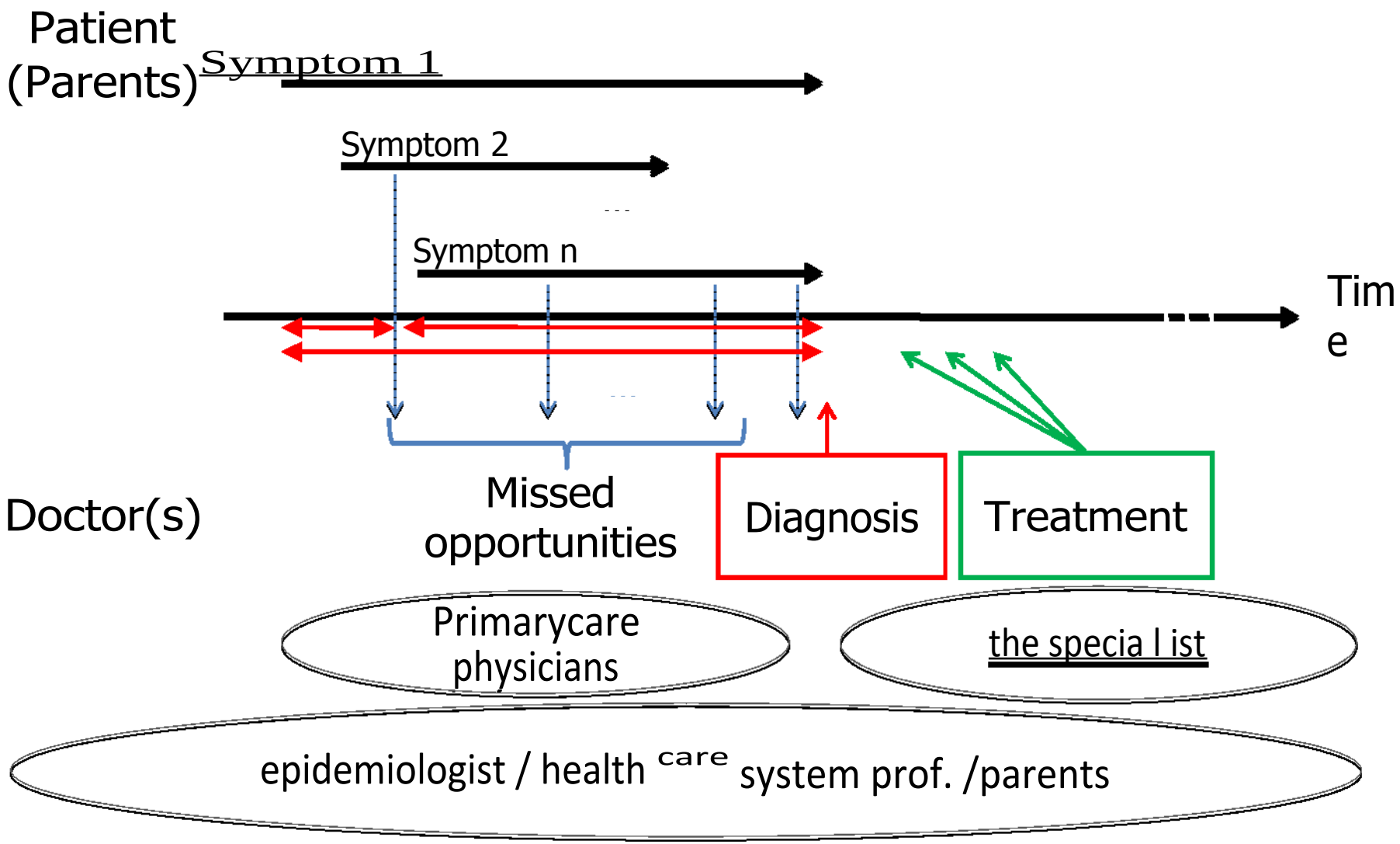
Interval between onset of symptoms and diagnosis of medulloblastoma in children: distribution and determinants in a population-based study

This exhaustiveness was verified for a 5-year period by the French National Paediatric Cancer Registry. As in any disease, the possibility of death before diagnosis cannot be ruled out but is likely to be very rare.

Brasme Eur J Pediatr 2011

Studied population

List of symptoms —> trigger diagnosis procedure



Studied population

List of symptoms / partial verif ication bias

Delayed diagnosis in type 1 diabetes mellitus

Arch Dis Child 2009;**94**:151–152.

METHODS

Children diagnosed with T1DM between January 2004 and June 2007 at Children's Hospital were identified from our paediatric diabetic database (Twinkle).

Ont-ils pu manquer un diagnostic durant la période d'étude?

Qu'aimeriez-vous savoir sur les pratiques en cours durant la période d'étude ?

Studied population

List of symptoms /partial verification bias

Pituitary Stalk Interruption Syndrome: Diagnostic Delay and Sensitivity of the Auxological Criteria of the Growth Hormone Research Society

During the study period, the local routine protocol called for the systematic prescription of GH stimulation tests for all patients seen for growth failure and for systematic MRI of the hypothalamic-pituitary area of those with GHD (as defined below).

Patients with a diagnosis of PSIS in the neonatal period were also excluded because their growth rate before diagnosis could not be calculated.

Géraldine Gascoin-Lachambre[1,2], Raja Brauner
PLoS ONE 6(1): 2011 | Volume 6

The devil is in the details

2. Measurement of diagnosis delay

Key points potentially associated with risks of bias and variation:

-T0 (à partir de quand le diagnostique était faisable)

-TX (date exacte du diagnostic)

-Assesors (number, agreement, qualification, blinding)

Measurement of diagnosis delay

T0 sometimes easy to def ine

Delayed Diagnosis of Kawasaki Disease: What Are the Risk Factors?

Pediatrics 2007;120;e1434-e1440

Question :comment définiriez-vous la date de début d'une maladie de Kawasaki ?

- Début de la conjonctivite :bras droit levé
- Début de l'altération de l'état général :bras gauche levé
- Début de la desquamation :aucun bras levé
- Début de la fièvre : 2 bras levés

Measurement of diagnosis delay

T0 sometimes easy to def ine

Delayed Diagnosis of Kawasaki Disease: What Are the Risk Factors?

Pediatrics 2007;120;e1434-e1440

We assessed delay in diagnosis of KD in 2 ways: (1) total number of illness days from onset of fever to diagnosis of KD;

Measurement of diagnosis delay

T0 not always easy to def ine

Common Variable Immunodeficiency Disorders in Children: Delayed Diagnosis Despite Typical Clinical Presentation

J Pediatr 2009;154:888-94

The median duration between first symptoms with probable relation to the immunodeficiency (recurrent or chronic infections, allergy-like symptoms) and the definitive diagnosis was 5.8 ± 4.2 years

Infectious disease	Patients affected
Bronchitis	28 (88%)
Pneumonia	25 (78%)
Sinusitis	25 (78%)
Otitis media	22 (69%)
Fungal infections (including skin)	15 (47%)
Gastrointestinal infections	10 (34%)
Skin infections	7 (22%)
Parasites	5 (16%)
Conjunctivitis	3 (9%)
Oral/Dental	3 (9%)

⇨ Attention aux symptômes "cumulatifs"

Measurement of diagnosis delay

Qualification of assesors

Suboptimal care in the initial management of children who died from severe bacterial infection: A population-based confidential inquiry*

Elise Launay, MD; Christèle Gras-Le Guen, MD, PhD; Alain Martinot, MD, PhD; Rémy Assathiany, MD;

Pediatr Crit Care Med 2010; 11:469–474

One of these experts was an experienced pediatrician in private practice and the other was a pediatric intensive care specialist who supervises a pediatric emergency department.

Measurement of diagnosis delay

Agreement between assesors

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Elise Launay, MD; Christèle Gras-Le Guen, MD, PhD; Alain Martinot, MD, PhD; Rémy Assathiany, MD;

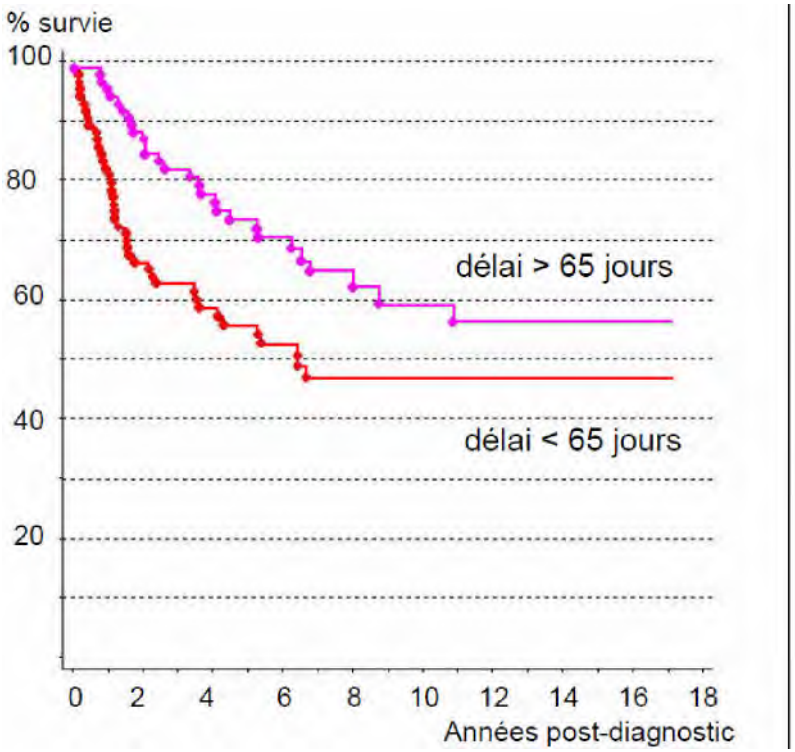
Pediatr Crit Care Med 2010; 11:469–474

The experts could reach one of three possible conclusions: certainly suboptimal management (situation 1); possibly suboptimal management (situation 2); and optimal management (situation 3). The degree of agreement between the experts was then assessed by calculating κ and weighted κ according to a quadratic method (Stata software, Stata Corp., College Station, TX).

Measurement of diagnosis delay

Blinded to outcome

In the case of ambiguity about whether an old symptom could be attributed to the tumour (for example, strabismus for several years), three of the authors (JFB, MC, and JG) independently evaluated this ambiguity and reached a consensus.



To avoid dif f ential classification bias

Long Time to Diagnosis of Medulloblastoma in Children Is Not Associated with Decreased Survival or with Worse Neurological Outcome

PLoS ONE 2012 | Volume 7

Jean-François Brasme[1,2,3*], Jacques Grill[1,2], François Doz[4,5], Brigitte Lacour[6]

Measurement of diagnosis delay

Blinded to outcome

Suboptimal care in the initial management of children who died from severe bacterial infection: A population-based confidential inquiry*

Elise Launay, MD; Christèle Gras-Le Guen, MD, PhD; Alain Martinot, MD, PhD; Rémy Assathiany, MD;

Pediatr Crit Care Med 2010; 11:469–474

We calculated the frequency of suboptimal care or errors in the management of the children who died of SBI. The suboptimal character of the initial management was first determined independently by two experts, blinded to final diagnosis and outcome.

⇨ Comment on fait en pratique ?

Blinded to outcome

anticipate

N° du patient : 6
Année de naissance : 2002
Age : **19 mois**

Sexe : **F**

ATCD : aucun
Vaccination : pentavalent à jour
Histoire de la maladie :

Date et heure	Evénements	Prise en charge
Date non précisée	Contage varicelleux (chez une soeur)	
Le 24/04/03	Apparition de vésicules de varicelle sans fièvre	
Le 25/04 au matin	Fièvre à 40°C avec un état général conservé	Les parents donnent du paracétamol et de l'ibuprofène en alternance toutes les 4 heures
Le 26/04	Température oscillant entre 37,5°C et 39,5°C sans autres symptômes	Poursuite du paracétamol et de l'ibuprofène
Le 27/04 au matin	Tâches bleutées sur la peau	Appel du médecin de garde
Le 27/04 vers 10h	Constatation de polypnée et de tachycardie par le médecin	Le médecin l'adresse aux urgences pédiatriques hospitalières
Le 27/04 à 12h10	Arrivée aux urgences par leurs propres moyens. Constatation d'un purpura diffus nécrotique avec un pouls à 245/min, une TA imprenable.	
Le 27/04 à 12h15		Administration d'1g de ceftriaxone (soit 67mg/kg) et de 200ml de gelofusine (13ml/kg) sur 20 minutes puis garde veine, intubation et ventilation assistée.
Le 27/04 à 13h22		arrivée en réanimation pédiatrique

The devil is in the details

3. Corrective plan

Key points potentially associated with risks of bias and variation:

-Patient delay, doctor delay

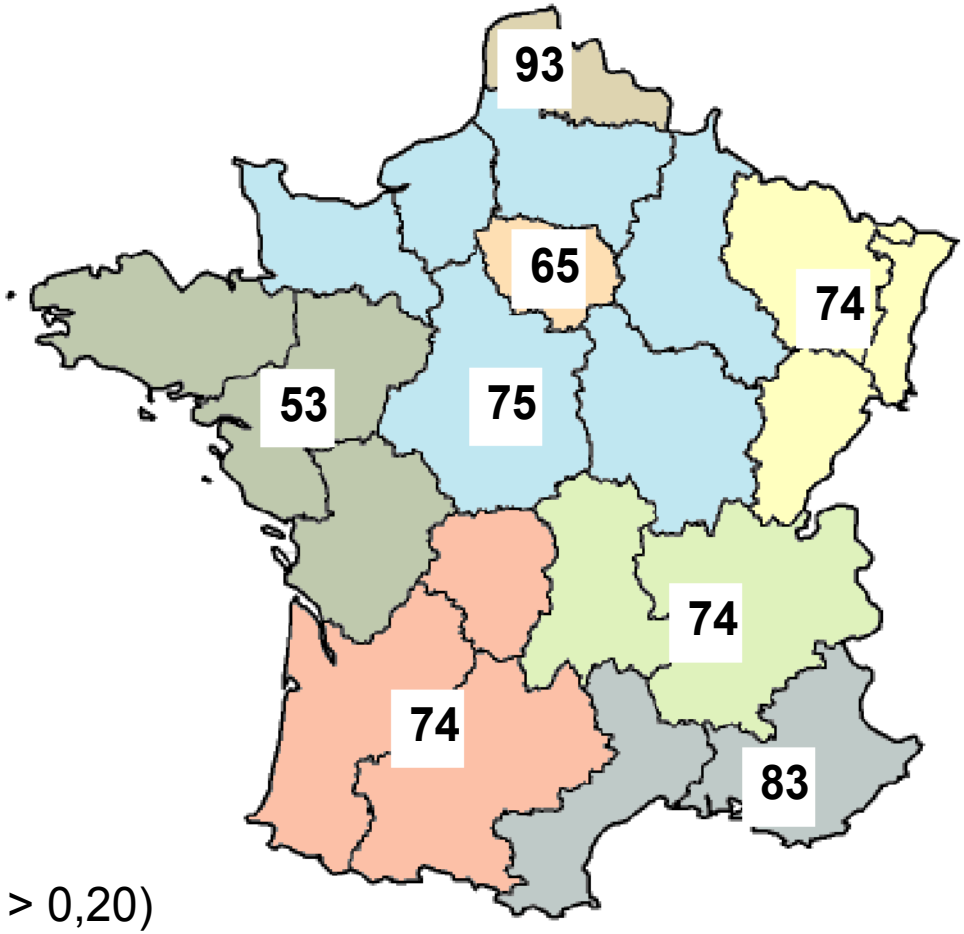
-Dealing with confounders while studying determinants and consequence of delays

-Lead time bias

-Action plan: f easability, sensivity, specificity

Non specif ic determinants of delays

Ex: Ewing sarcoma, France, n = 436

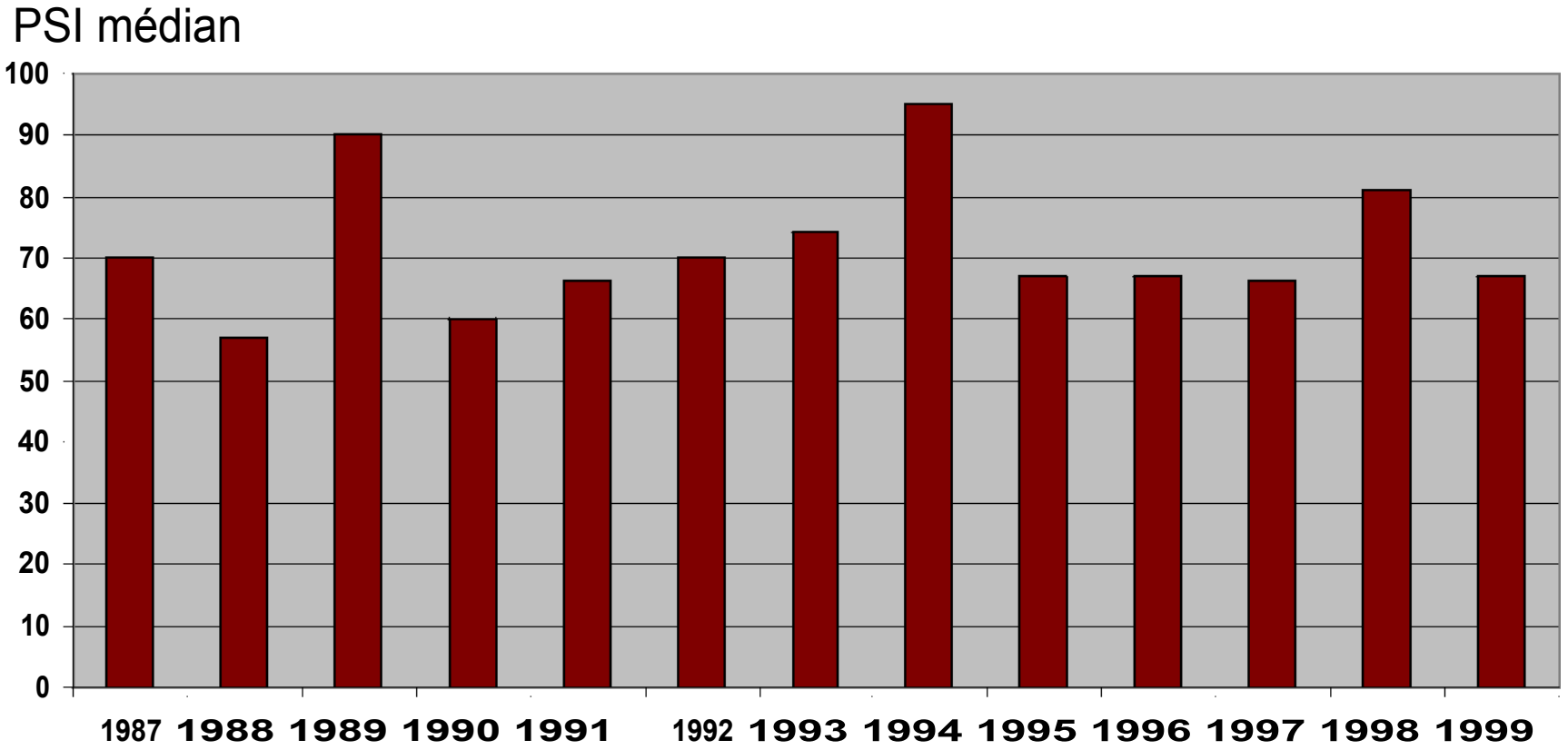


(p > 0,20)

Brasme JF et al. *submitted*

Non specif ic determinants of delays

Ex: Ewing sarcoma, France, n = 436



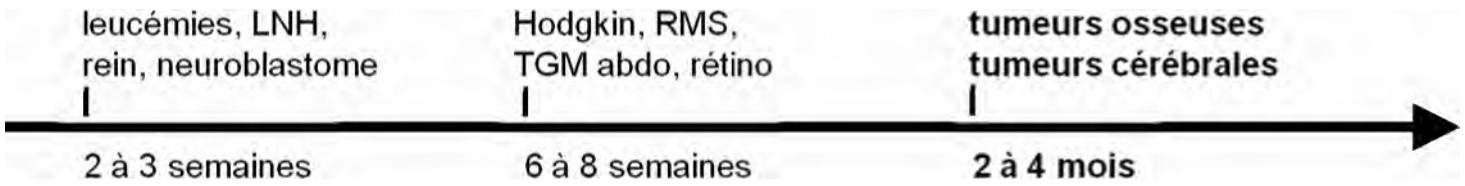
(p > 0,20)

Brasme JF et al. *submitted*

Non specif ic determinants of delays

Ex: age / pediatric cancer

23 studies[15–18,20,25,27,28,30,33,34,37,38,40–49] had data for the relation between age of patients and time to diagnosis. In 19 of these studies[15–18,20,25,27,28,30,33,34,38,40–46] time to diagnosis was longer for older children than for younger children



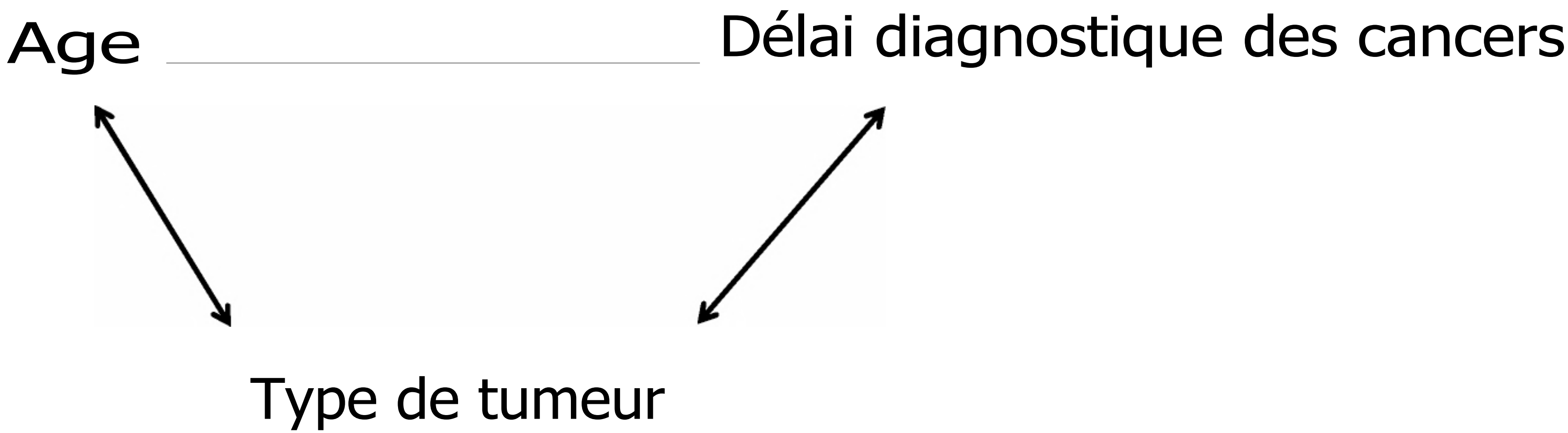
Delays in diagnosis of paediatric cancers: a systematic review and comparison with expert testimony in lawsuits

Jean-François Rivière*, Michèle Morfouace*, Jacques Grill, Alain Monnier, Henri Amalberti, Catherine Raux-Lemoyne, Martin Chalumeau

Lancet Oncol 2012; 13: e445–59

Non specif ic determinants of delays

Ex: age / pediatric cancer



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Non specif ic determinants of delays

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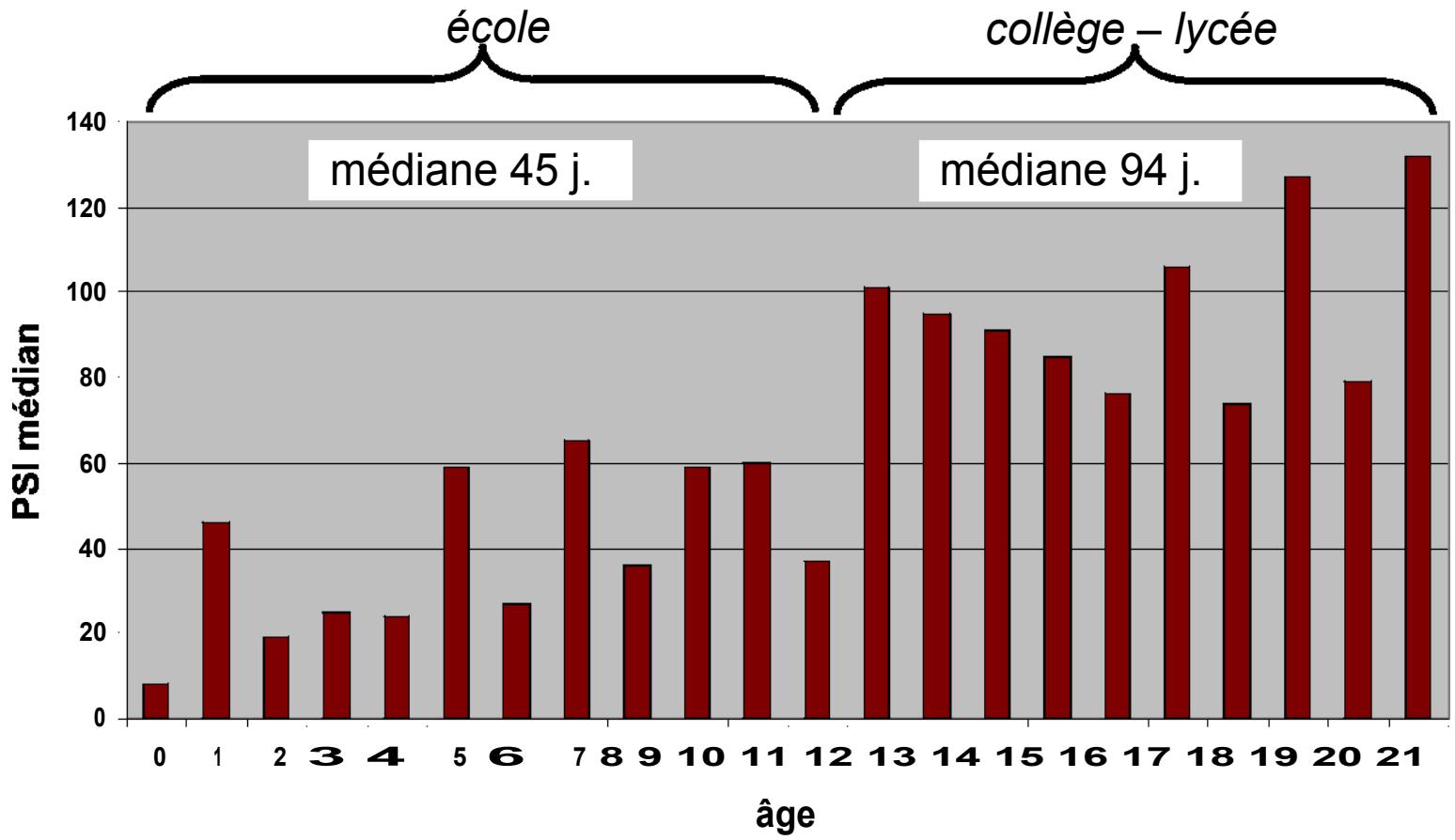


(p < 0,0001 ; variables dichotomisées ou continues + polynôme fractionnaire)

Brasme JF et al. *submitted*

Specif ic determinants of delays

Quantitative analyses

Interval between onset of symptoms and diagnosis of medulloblastoma in children: distribution and determinants in a population-based study

Characteristics	Number	Median interval (days)	*p* value[a]
Symptoms and clinical signs			
1st symptom=headaches	52	43	0.0003
1st symptom=other	114	77	
Psychological symptoms[b]	44	91	0.001
Absence of psychological symptoms	122	60	
Including impaired school performance[c]	26	145	<0.0001
Absence of impaired school performance	115	57	

Brasme Eur J Pediatr 2011

Specif ic determinants of delays

Qualitative analyses of long delay

the leading cause was the complete absence (25%) or lateness (after more than 30 days of one of the symptoms for 36% of the patients) of the combination of headaches and vomiting, which led to their doctors to consider diagnoses related to gastrointestinal problems (33%) or migraine or tension-type headaches (18%). Among the patients with this headache–vomiting combination, 44% had a brain CT after 30 days of the onset of these combined symptoms, because they did not worsen but remained mild or even regressed spontaneously, but temporarily. Symptoms or signs suggesting neurological disorders, such as cerebellar ataxia, cranial nerve palsy, or disorders of consciousness occurred late (57%) or not at all (24%). Finally, the presence of psychological symptoms (35%), which were often the first symptoms (22%) and normal results from neurological (27%) or fundus examinations (41% of the 51 who had a fundus examination) contributed to the diagnosis delays.

Brasme Eur J Pediatr 2011

Outcome (immediate)
and time to diagnosis

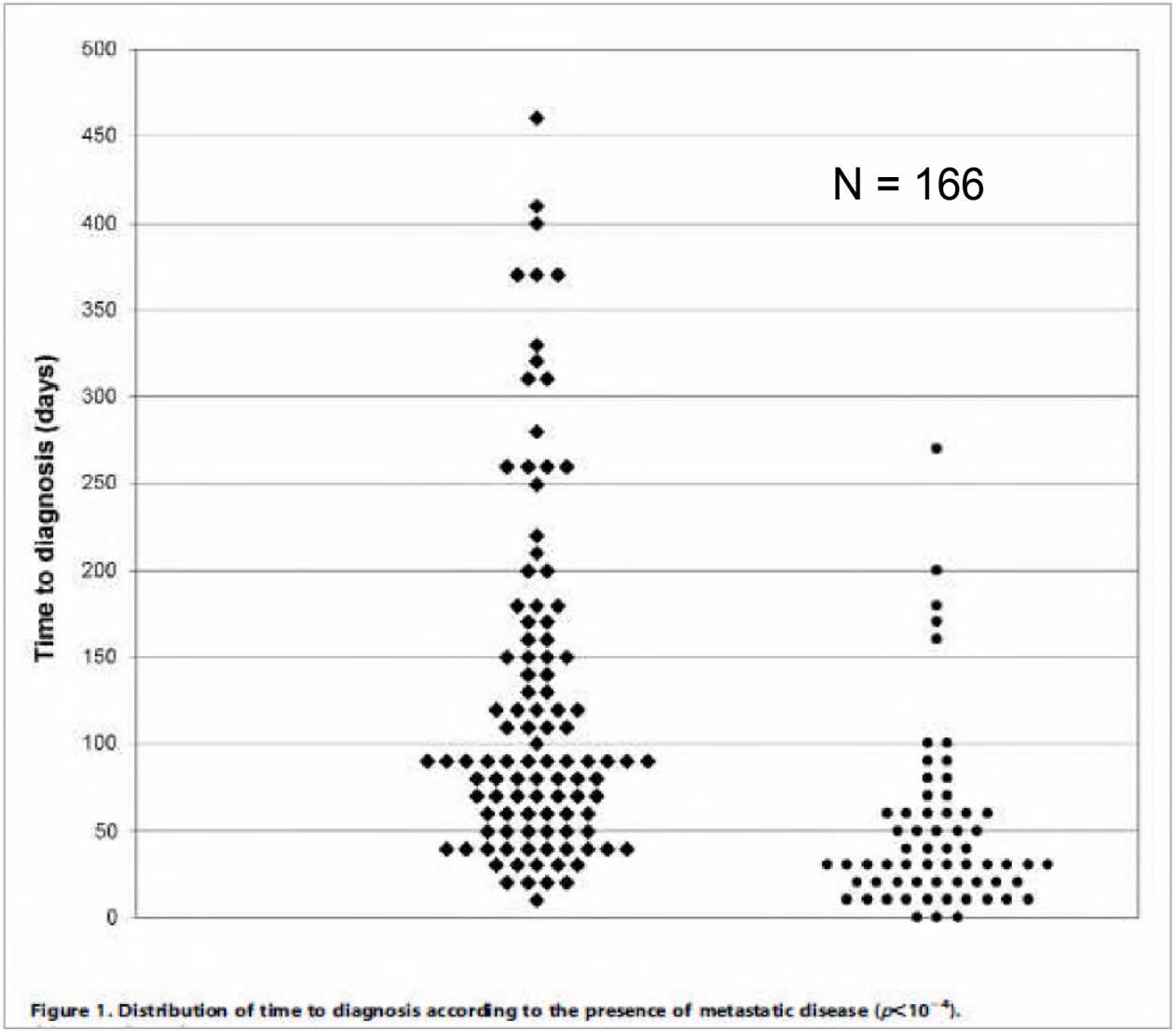
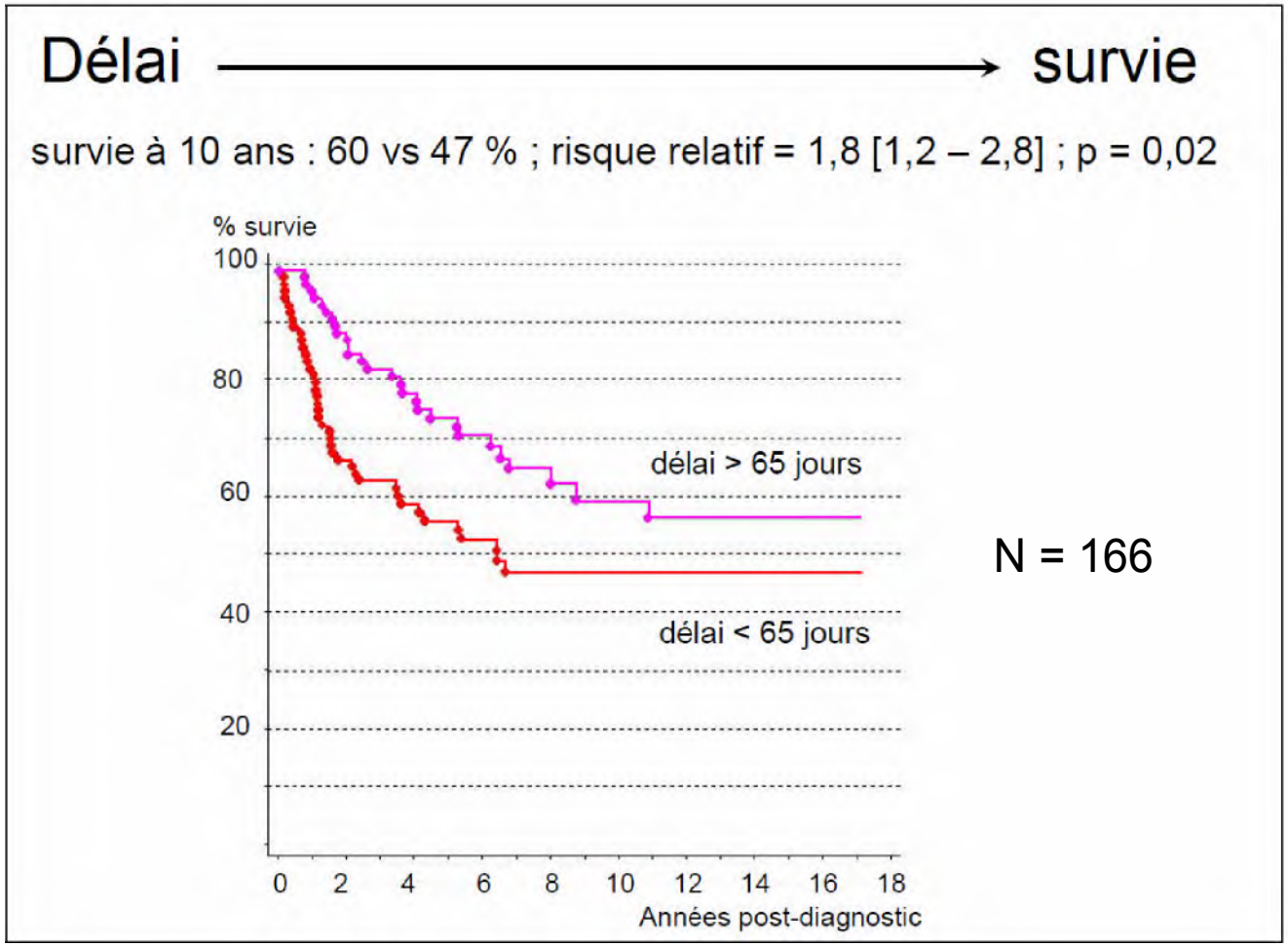


Figure 1. Distribution of time to diagnosis according to the presence of metastatic disease ($p<10^{-4}$).

Outcome (survival)
and time to diagnosis



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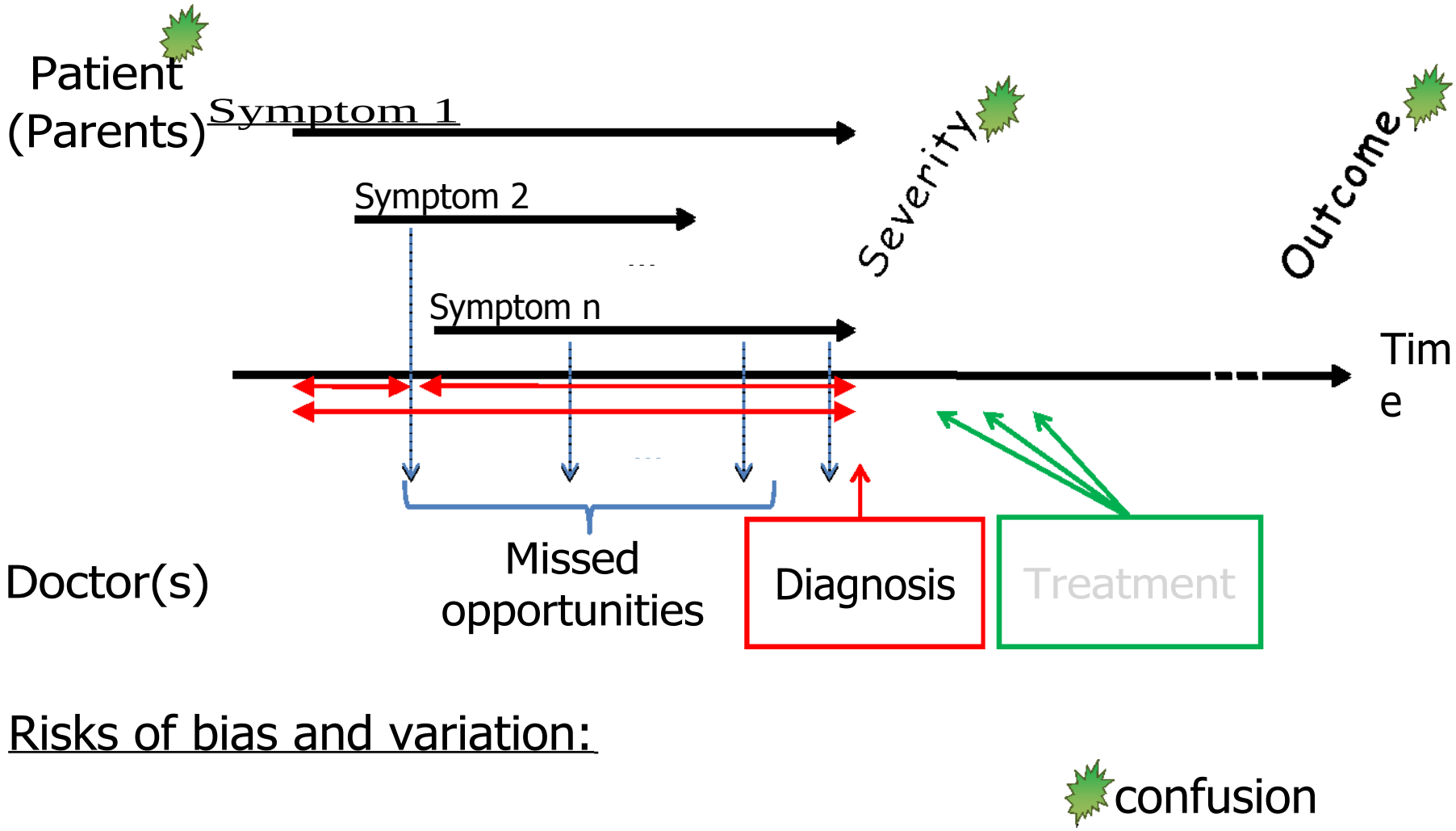
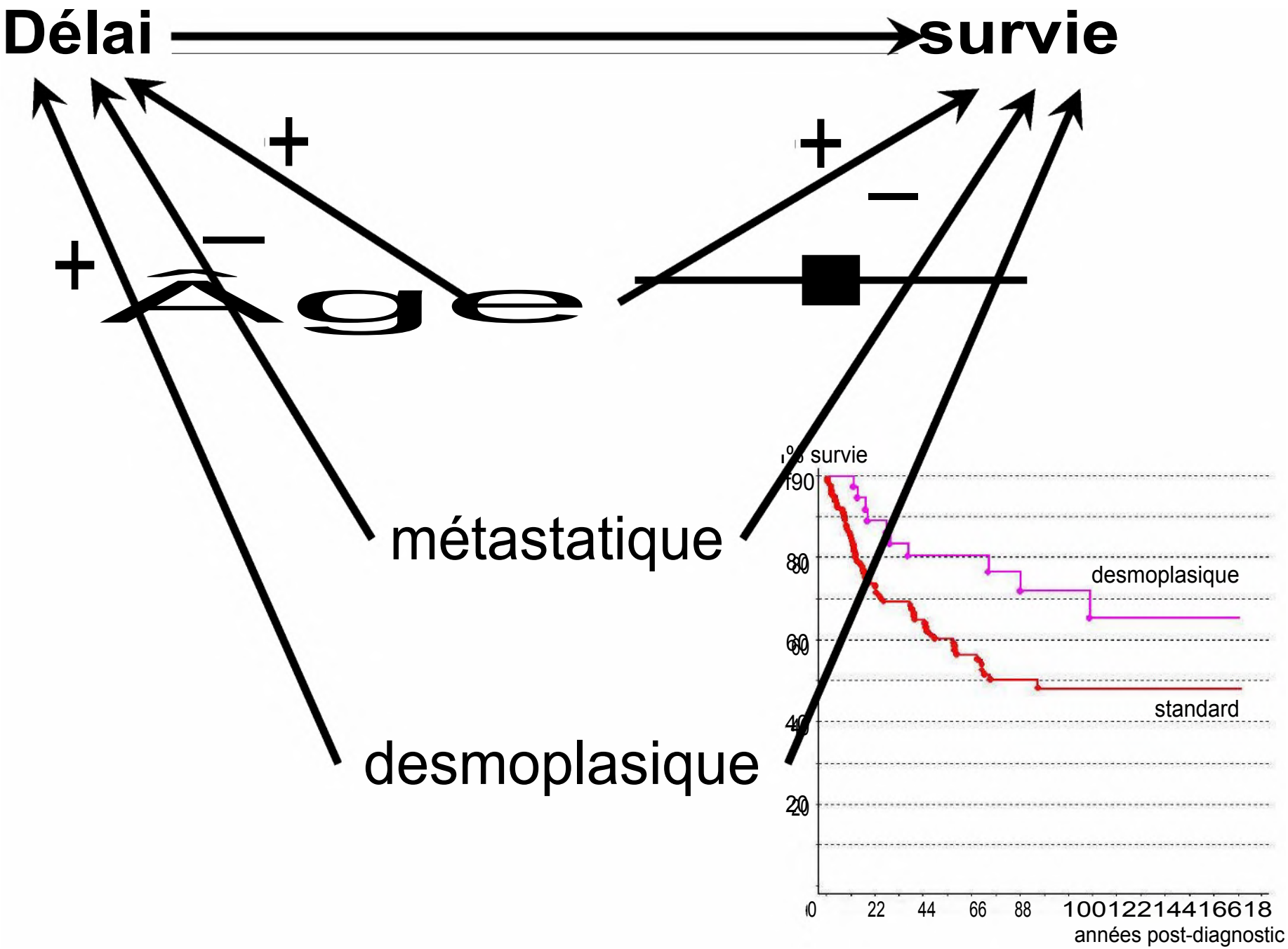
PLoS ONE 2012 | Volume 7
Jean-François Brasme[1,2,3*], Jacques Grill[1,2], François Doz[4,5], Brigitte Lacour[6]

The devil is in the details



Risks of bias and variation:

confusion


Délai
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+
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métastatique
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standard
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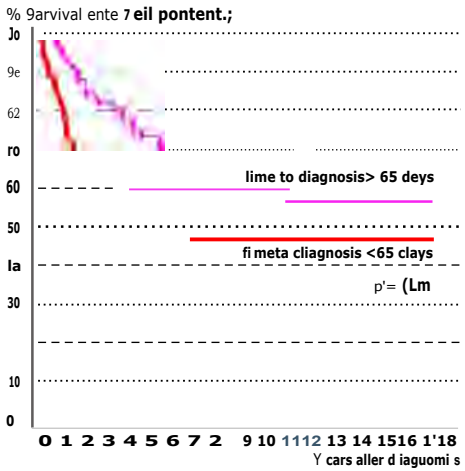
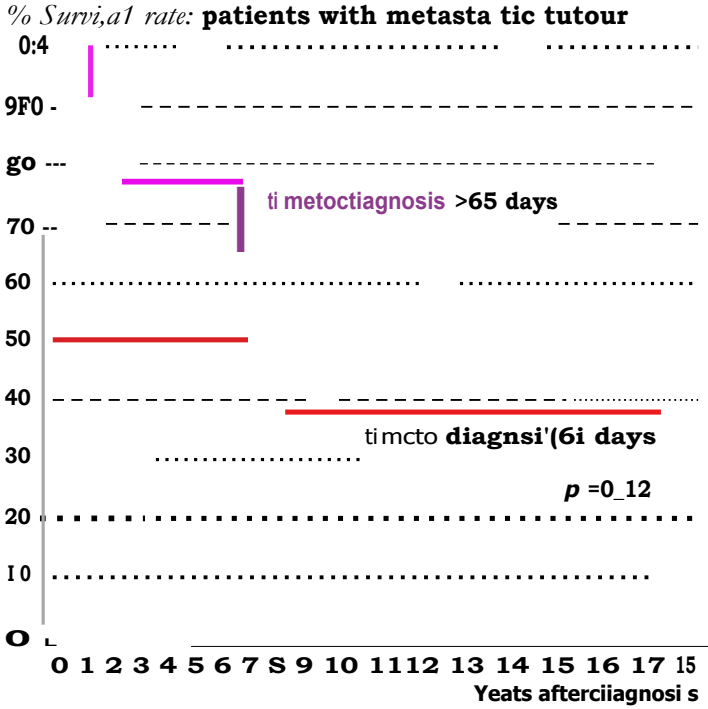
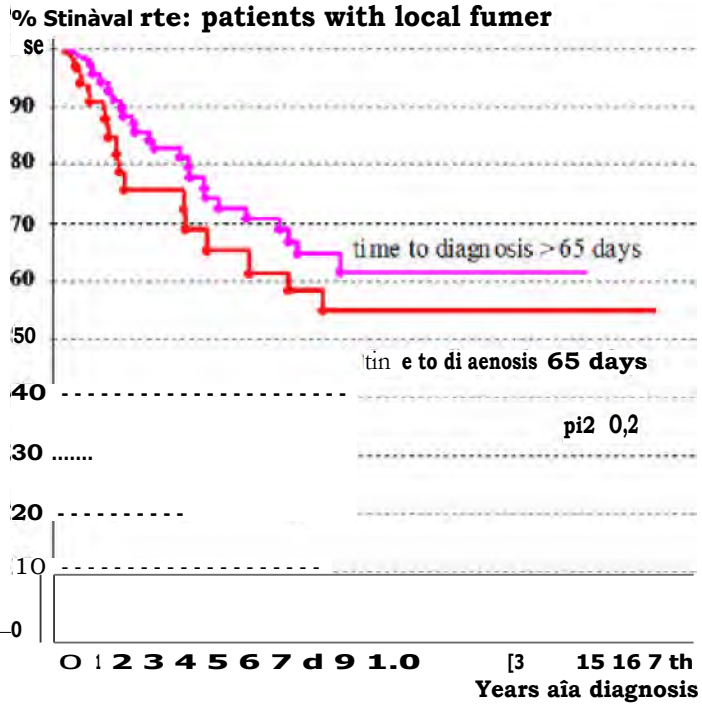
44
66
88
100122144166 18
années post-diagnostic







Long Time to Diagnosis of Medulloblastoma in Children Is Not Associated with Decreased Survival or with Worse Neurological Outcome

PLoS ONE 2012 ! Volume 7

Jean-Francois Brasme" ³', Jacques Grill", Francois Doz⁴ ⁵, Brigitte Lacour6

Outcome (survival)
and time to diagnosis

Table 3. Survival according to age, tumor characteristics, and time to diagnosis (TtD).

Characteristics	*n* (total = 166)	10-year survival (%)	relative risk [95% CI] univariate analysis	*p**	adjusted relative risk [95% CI] multivariate analysis‡	*p**
TtD<median (65 days)	83	47	1.8 [1.2, 2.8]	0.02	1.5 [0.8, 2.5]	0.17
≥median	83	60				
Age at diagnosis <5 years	51	45	1.9 [1.2, 3.1]	0.007	1.7 [1.0, 2.8]	0.04
>5 years	115	57				
Metastatic tumor§	62	43	1.8 [1.1, 2.9]	0.01	1.3 [0.7, 2.2]	0.4
Localized tumor	103	59				
Standard histology	130	48	2.1 [1.1, 4.1]	0.03	1.7 [0.9, 3.4]	0.12
Desmoplastic histology	36	72				
Incomplete resection or no surgery	80	44	1.7 [1.1, 2 .7]	0.03	1.6 [0.9, 2.6]	0.09
Complete tumor resection	86	68				
Tumor volume>median (33 cm^3)	83	53	1.1 [0.7, 1.8]	0.6	-	-
<median	83	54				

Long Time to Diagnosis of Medulloblastoma in Children Is Not Associated with Decreased Survival or with Worse Neurological Outcome
PLoS ONE 2012 | Volume 7
Jean-Francois Brasme[1,2,3], Jacques Grill[1,2], Francois Doz[4,5], Brigitte Lacour[6]

Outcome
and time to diagnosis

Residual confounding due to incomplete adjustment in studies is another potential issue with our methods, and is highly suspected in studies in which a paradoxical association between long time to diagnosis and better outcomes persists after adjustment, because no possible causal links exist.

The apparently contradictory relation between a long time to diagnosis and better outcomes that is noted in some studies does not mean that diagnosis should be delayed on purpose.

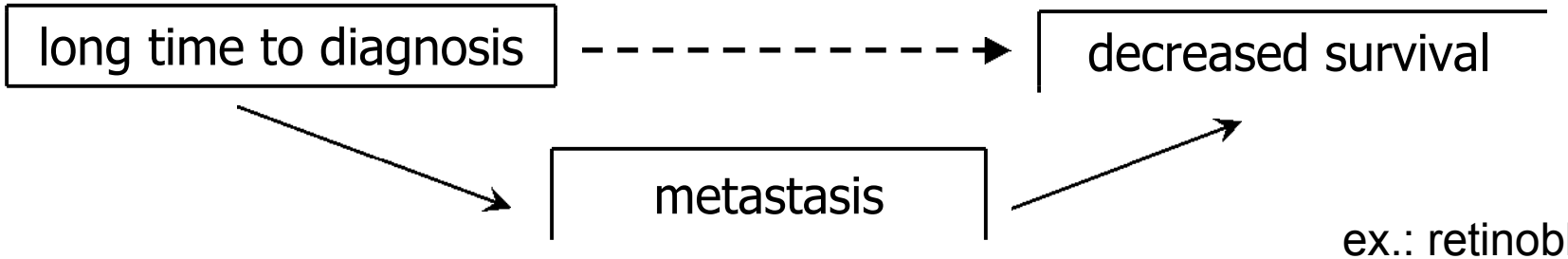
Delays in diagnosis of paediatric cancers: a systematic review and comparison with expert testimony in lawsuits

Jean-François Rosenne*, Michèle Morfouace*, Jacques Grill, Alain Monnier, Henri Amalberti, Catherine Raux-Lemoyne, Martin Chalumeau

Lancet Oncol 2012; 13: e445–59

To ad j ust
or not to ad just

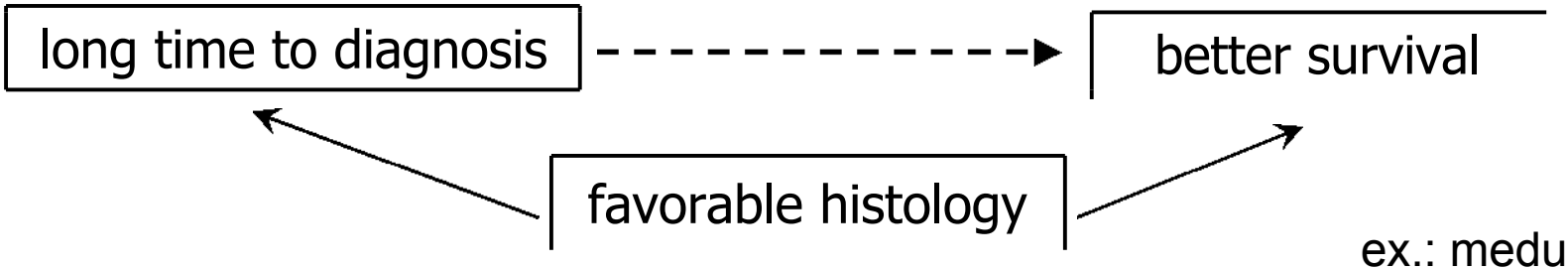
- **Do not adjust for intermediate factors:**



ex.: retinoblastoma

the effect of TtD on survival is mediated by a causal intermediate factor: adjustment would make a real relation with TtD disappear

- **Adjust for confounding factors:**



ex.: medulloblastoma

the lack of adjustment is a potential source of bias since outcome probably depends on many things besides TtD

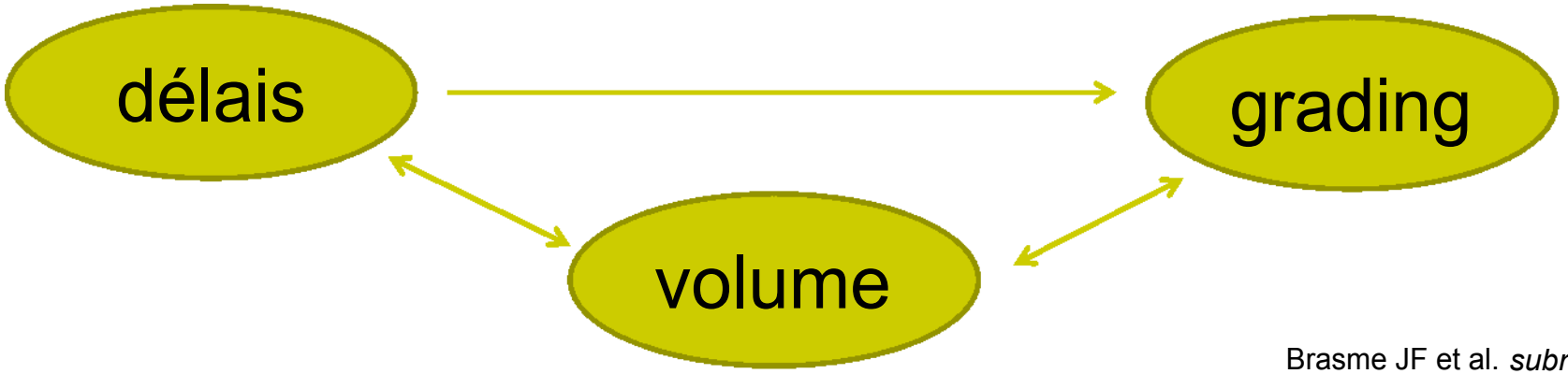
Outcome / Delays / Adjustment

Ex: Ewing sarcoma, France, n = 436

variable	n (%) (total = 274)	PSI médian (jours)	p
grading histo < 10 % *	167 (61%)	55	
grading histo >_ 10 %	86 (31%)	82	0,03 **
volume tumoral < 200 ml *	182(66%)	58	
>_ 200 ml	87 (32%)	79	0,04 **

** En analyse univariée.

Mais après ajustement sur volume, le délai diagnostique PSI n'est plus significativement associé au grading (p = 0,30).



Brasme JF et al. *submitted*

Outcome / Delays / Adjustment

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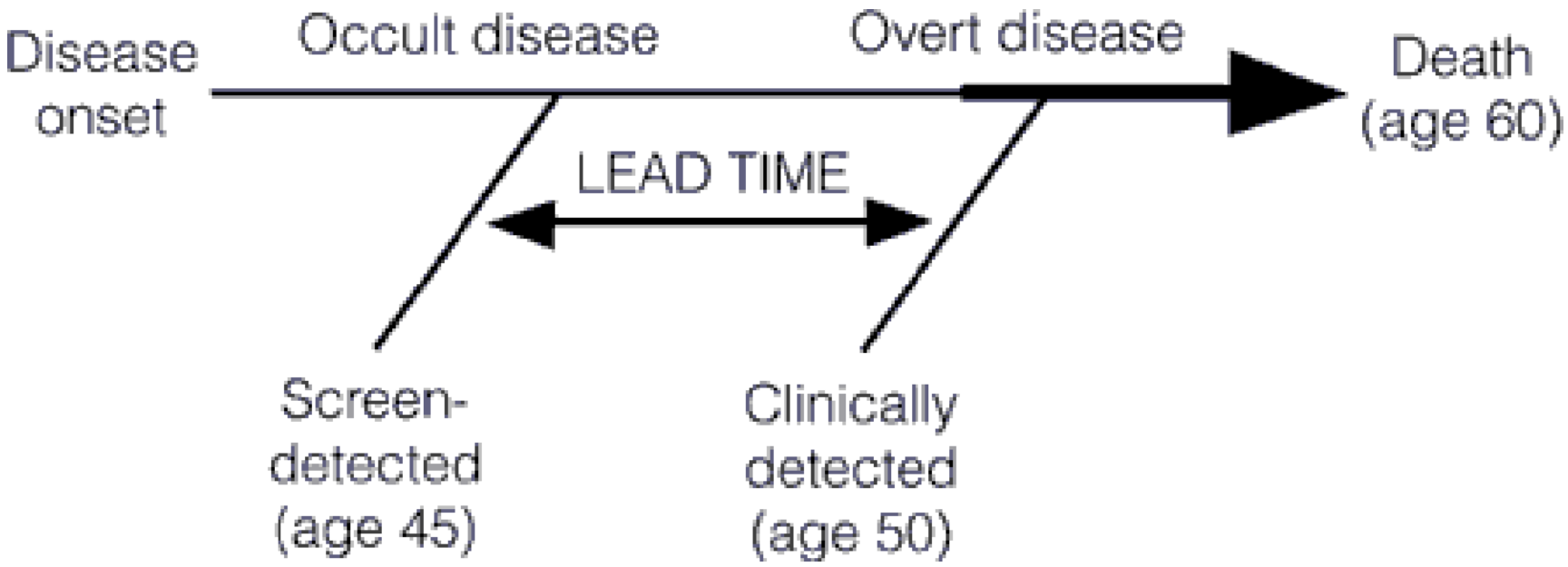
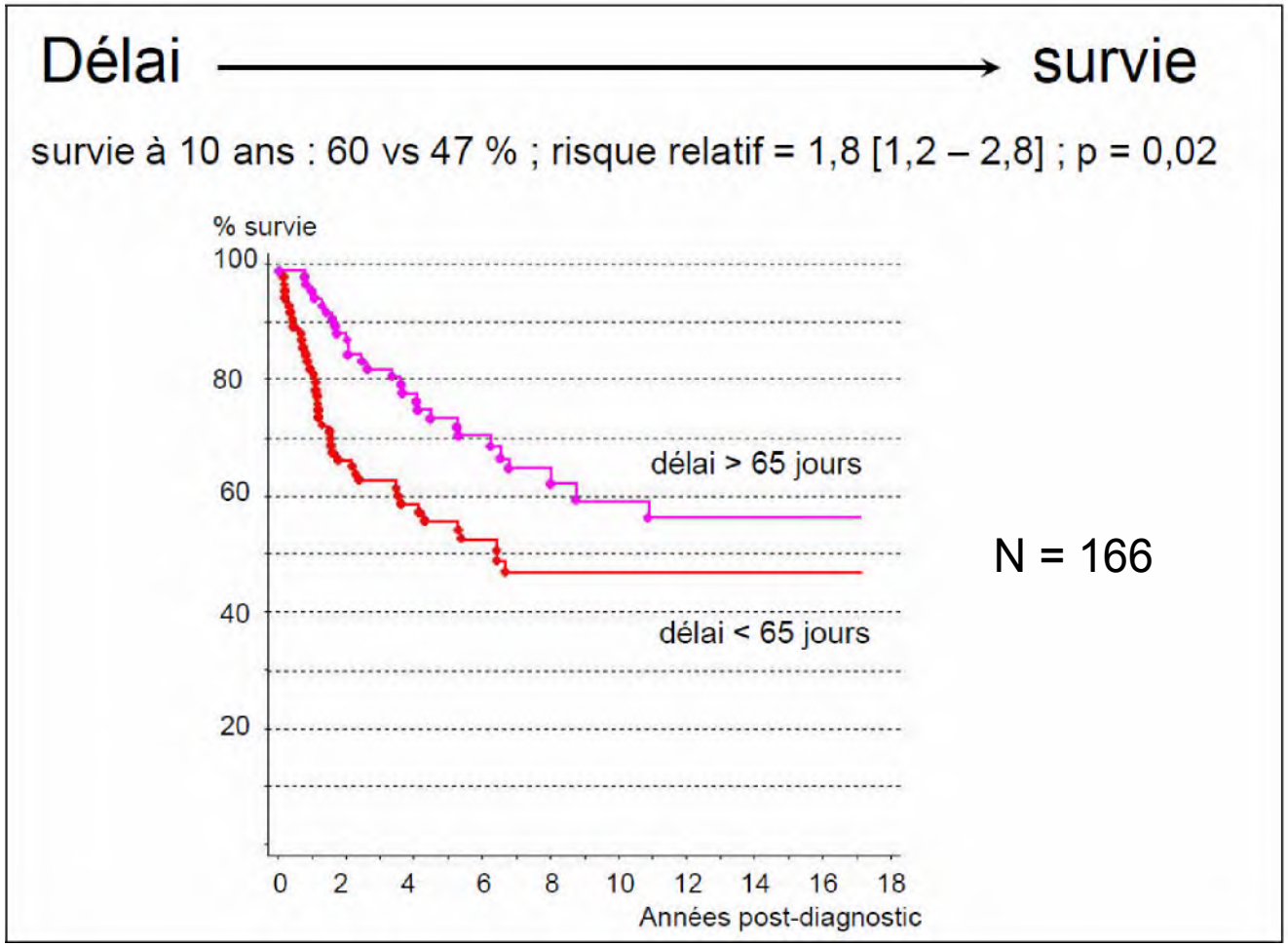
Brasme JF et al. *submitted*

Outcome

Lead time bias



Outcome
Lead time bias



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PLoS ONE 2012 | Volume 7
Jean-François Brasme[1,2,3], Jacques Grill[1,2], François Doz[4,5], Brigitte Lacour[6]

Corrective plan
Avoidability of delays

Pituitary Stalk Interruption Syndrome: Diagnostic Delay and Sensitivity of the Auxological Criteria of the Growth Hormone Research Society

In all, 71% of patients had a diagnostic delay greater than 1 year. Correct application of the GHRS auxological criteria could have allowed diagnosis of these patients and the beginning of their treatment 2 years earlier.

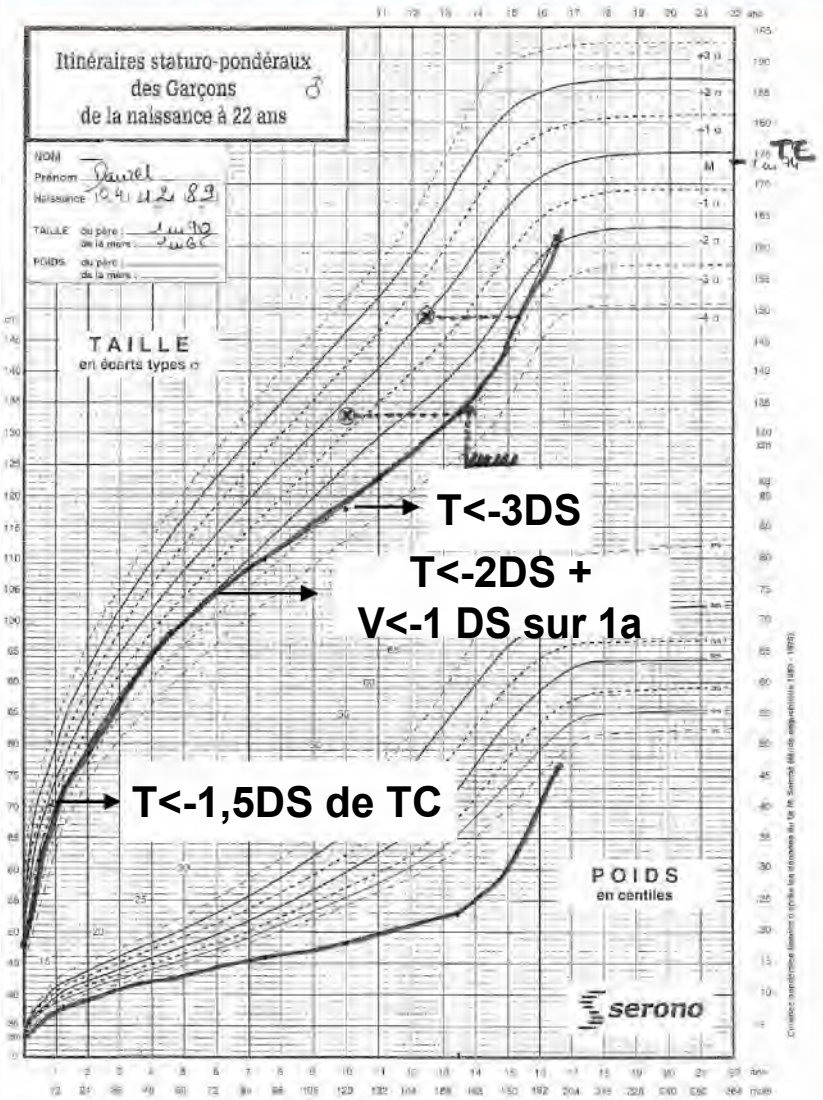
Table 2. Individual analysis of auxological GHRS criteria.

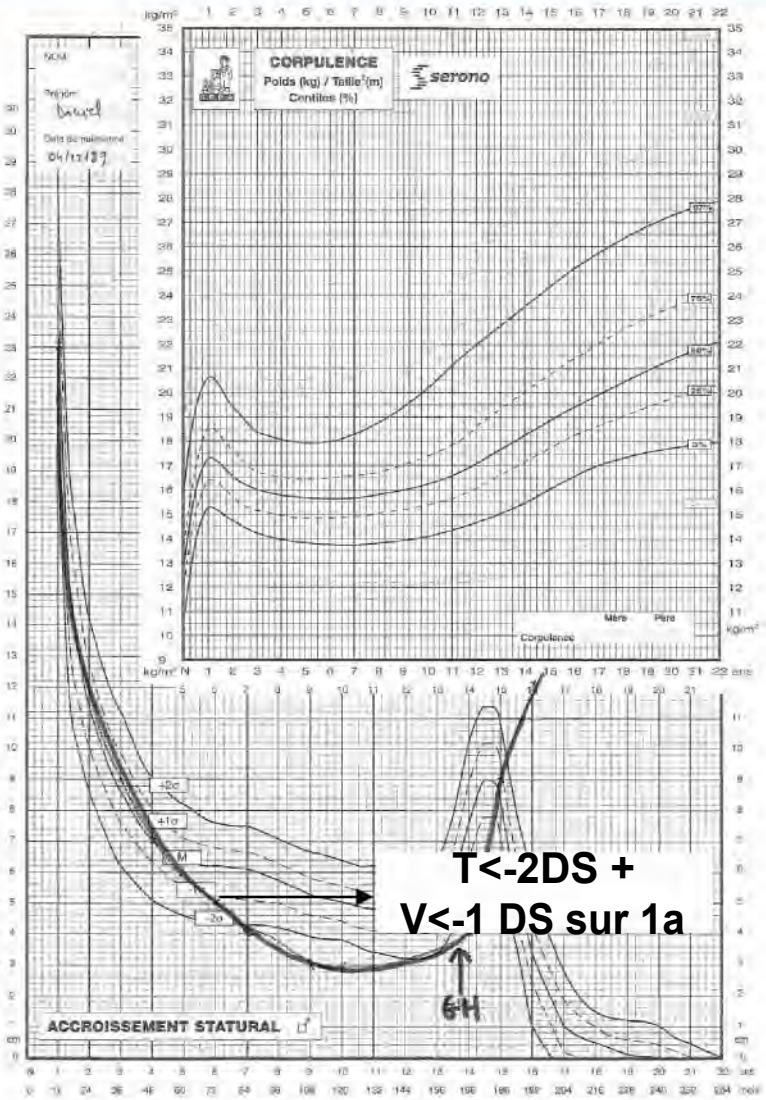
	Height <−3 SDS	Height <−1,5 SDS below the target height	Height <−2 SDS and height velocity <−1 SDS*	Height <−2 SDS and height diminution >0,5 SDS**	Normal height and height velocity <−2 SDS*	Normal height and height velocity <−1,5 SDS***	At least one of the 6 criterion
Potential reduction of diagnostic delay among all patients (yr) median (range) (IQR)	0 (0; 6.8) (0; 2)	2 (0; 12.6) (0.6, 2.8)	1.5 (0; 9.6) (0; 3)	0 (0; 1.5) (0; 0)	0 (0; 4.5) (0; 0)	0 (0; 6.5) (0; 0)	2.3 (0; 12.6) (1.5; 3.6)

Géraldine Gascoin-Lachambre[1,2], Raja Brauner
PLoS ONE 6(1): 2011 | Volume 6

Height <−3 SDS	Height <−1,5 SDS below the target height	Height <−2 SDS and height velocity <−1 SDS*	Height <−2 SDS and height diminution >0,5 SDS**	Normal height and height velocity <−2 SDS*	Normal height and height velocity <−1,5 SDS***

Methods: A single-center retrospective case-cohort study covering records from January 2000 through December 2007
21patients with GHD and PSIS





Corrective plan
Avoidability of delays

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Géraldine Gascoin-Lachambre[1,2], Raja Brauner
PLoS ONE 6(1): 2011 | Volume 6

Corrective plan
Specificity

Pituitary Stalk Interruption Syndrome: Diagnostic Delay and Sensitivity of the Auxological Criteria of the Growth Hormone Research Society

The specificity of each of the best criteria identified by our study (height more than 1.5 SDS below the target height, as well as height more than 2 SDS below the mean + height velocity over 1 year more than 1 SDS below the mean for chronological age) could not be determined

Géraldine Gascoin-Lachambre[1,2], Raja Brauner
PLoS ONE 6(1): 2011 | Volume 6

Corrective plan

Case-referent appraoch

Table 4 Combining rules using a high specificity strategy

Row	Rule	Scenario parameters							Sensitivity (*100)	Specificity (*100)	MRA
		a	*b*	*c*	*d*	*e*	*f*	*g*			
1	phc			−2.0	−2.0				76.9	99.4	5.2
2	sds	−3.5	−3.0						41.4	98.1	4.8
3	phc-sds	−3.5	−3.0	−2.0	−2.0				82.4	97.5	4.7
4	phc			−2.0	−2.0				76.9	99.4	5.2
5	def					3	−2.0	−0.25	23.3	100.0	7.7
6	phc-def			−2.0	−2.0	3	−2.0	−0.25	79.2	99.4	5.3
7	phc			−2.0	−1.5				84.9	98.8	5.1

Rows 1–3 list a parental height corrected (phc), an absolute sds (sds), and their combined (phc-sds) rule. Rows 4–6 list a parental height corrected (phc), a deflection (def), and their combined (phc-rule) rule. Row 7 is a single parental height corrected rule that is better than row 3 but not preferable to row 6.
MRA, median referral age.

Median age of diagnosis of TS (years) (n = 46)	
45,X (n = 27)	6.9

S van Buuren
Arch Dis Child 2004;**89**:336–341

Corrective plan
Specificity / f easability

Delayed Recognition of Initial Stroke in Children: Need for Increased Awareness

Pediatrics 2009;124:e227–e234

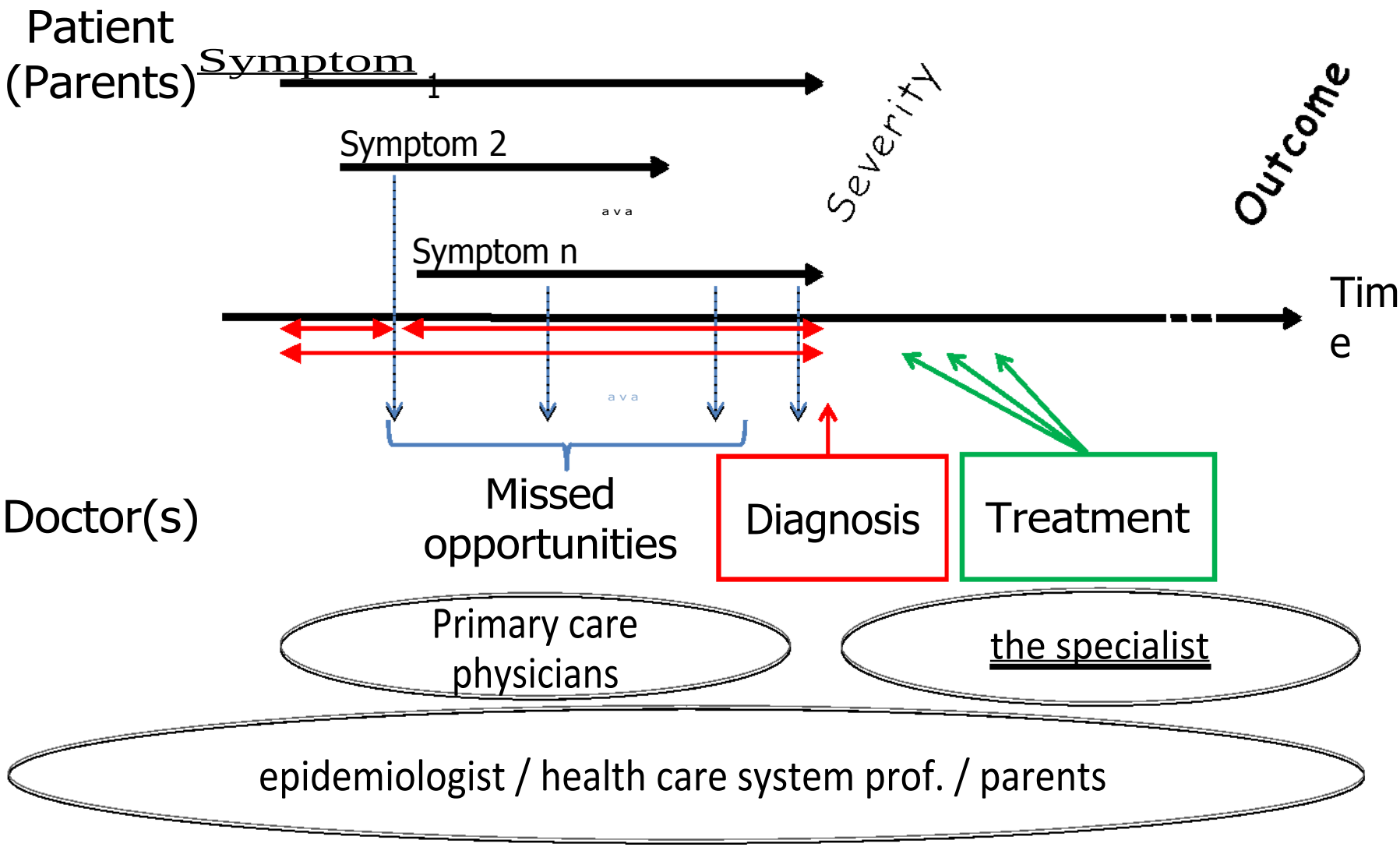
CONCLUSIONS: The considerable delays in the diagnosis of pediatric AIS are most likely related to the lack of awareness of stroke among medical staff members, despite risk factors and focal signs at presentation.

DISCUSSION Stroke should be suspected for any neonate presenting with seizures, lethargy, or apnea

⇨ 50% des 30-32 SA

Solutions ?

Chercher l'erreur



Corrective plan
Specificity / f easability

Solutions

METHODS

Cases were ascertained by using International Classification of Diseases (ICD) revisions 9 and 10 codes applied to discharge diagnoses (Table 1), on the basis of standardized methods recommended by the International Pediatric Stroke Study.

CONTRIBUTORS

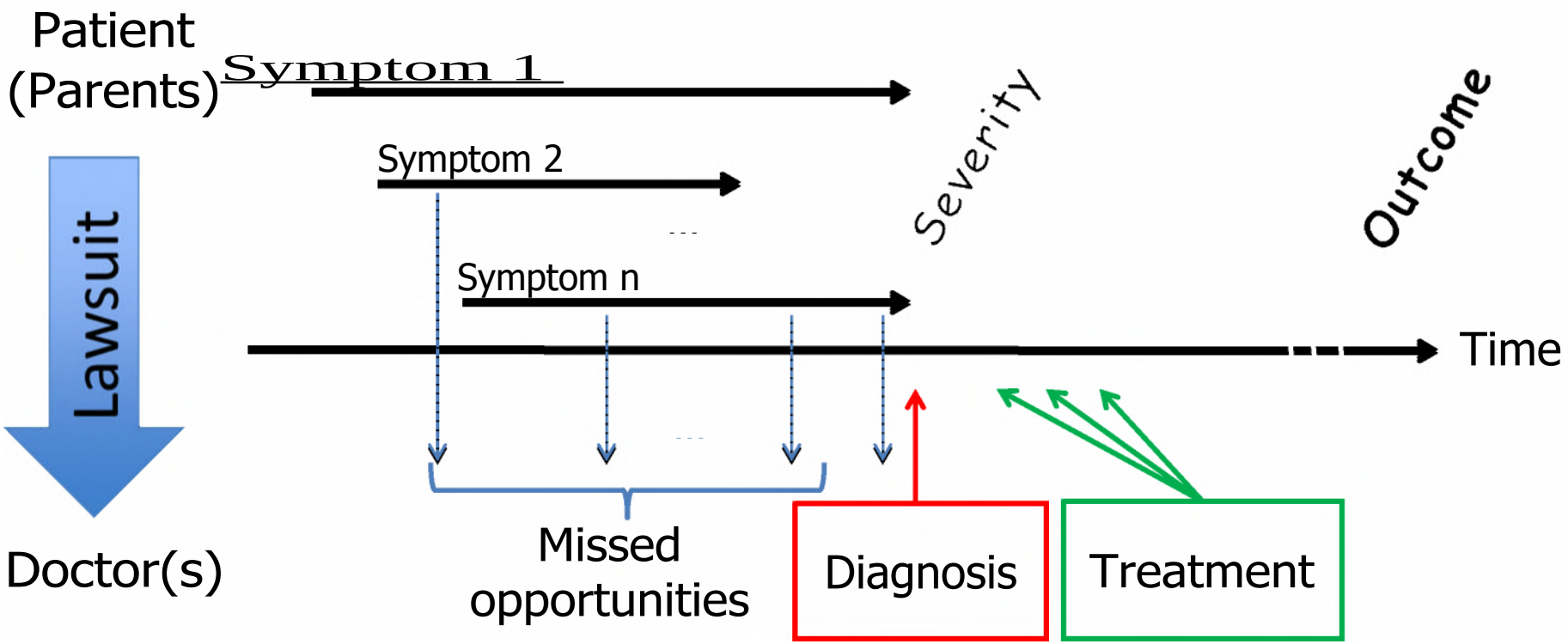
[a]Department of Pediatric Neurology, Royal Children's Hospital, Melbourne, Australia; Departments of [b]Pediatric Neurology and [c]Pediatrics, British Columbia Children's Hospital, Vancouver, Canada; and [d]Department of Neurosciences, Monash Medical Centre, Melbourne, Australia

Des erreurs impossibles avec une culture
(1) méthodologique et (2) de collégialité médicale

Describe how cases were identified	20(40)
List the symptoms allowing the physician to trigger diagnosis procedure (alert symptoms) during the study period	35(70)
State if all patients with alert symptoms underwent the reference diagnosis procedure	48(96)
Discuss possible recruitment bias	28(70)
Discuss possible undiagnosed cases	43(86)
State the definition used for	
T0 of illness (symptoms, signs)	27(54)
Tx of diagnosis used in the study	24(48)
Describe	
how many assessors evaluated diagnostic delay	40(80)
if evaluations were independent	5(50)
the degree of agreement about diagnostic delay between the different assessors	4(80)
how potential disagreements were resolved	4(80)
Describe the qualification of the assessors who evaluated diagnostic delay	41(82)
State whether the persons who determined diagnostic delays were blinded to the outcome	49(98)
Report for the entire group	
Mean/median diagnosis delay	20(40)
Distribution of diagnostic delay	19(38)
Discuss the bias in and the precision of the measurement of delay	29(58)

Launay E et al. *submitted*

Last but not least



Délais / Retards / Plaintes

une séquence stressante

Question : Les délais/retards diagnostiques sont-ils une cause fréquente de plainte en pédiatrie?

- OUI : bras droit levé
- NON: bras gauche levé
- SANS AVIS: aucun bras levé
- RENVOYEZ CE CONFERENCIER CHEZ LUI : 2 bras levés

Délais /Retards /Plaintes

une séquence fréquente

Table 3 Comparison of paediatric malpractice claims in France and in the USA

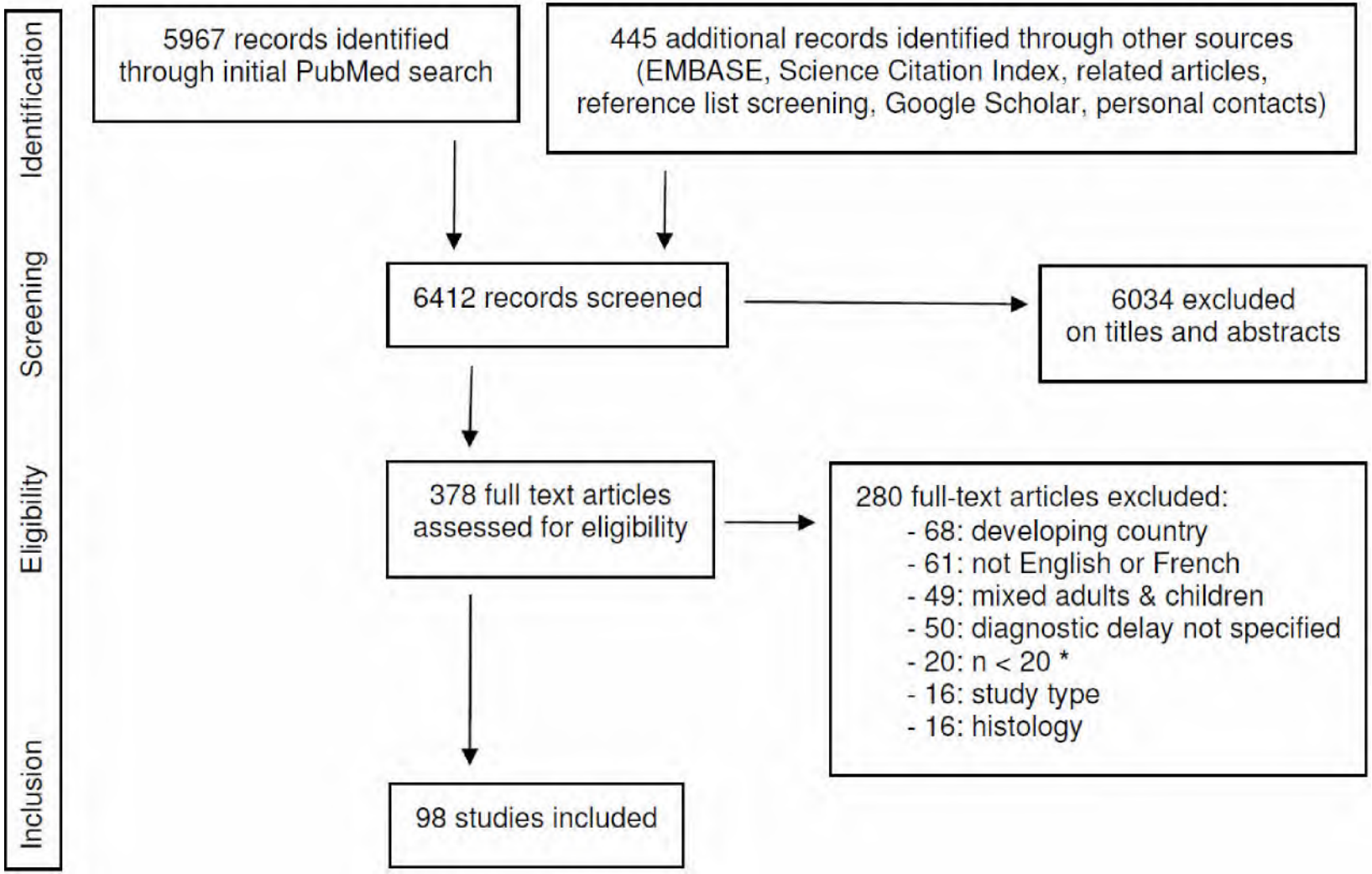
Characteristics	France	USA	
		Carroll *et al*[8]	Selbst *et al*[6]
Cases (No)	228	6363	2283
Data source	Sou Médical-Groupe MACSF (2003–2007)	PIAA* (1985–2005)	PIAA (1985–2000)
Age	1 month to 18 years	0–18 years	0–18 years
Physician involved in claims	Paediatrician, GP†	Paediatrician	Physician involved in urgent care
Most common misadventure	Diagnostic error	Diagnostic error	Diagnostic error

Malignancy was the most common medical condition incorrectly diagnosed (14%).

Epidemiology and aetiology of paediatric malpractice claims in France
Najaf-Zadeh A, Dubos F, Pruvost I, *et al*. *Arch Dis Child* (2010)

Expertises judiciaires

vs niveau de preuve scientifique



Expertises judiciaires

vs niveau de preuve scientifique

	n	Delay cutoff	Prognostic factors	Survival	Sequelae
Medulloblastoma					
Cervoni et al,[60] 1995	29	Not specified	..	NS (no details available)	..
Halperin et al,[20] 2001	108	Continuous data	Better (no metastasis)*	..	..
Urberuaga et al,[61] 2006	75	30 days	..	NS (10 year survival 36% *vs* 48%, p=0·63)	..
Kukal et al,[33] 2009	57	20, 60, or 180 days	..	NS (p=0·77)	..
Gerber et al,[46] 2011	224	1, 2, or 4 months	Better (no metastasis); no relation to histological subtype or expression of cMYC (HUGO name MYC) or TrkC (HUGO name NTRK3); completeness of resection	NS (p=0·24)*	..
Brasme et al,[26] 2012‡	166	65 days	Better (no metastasis*, desmoplastic type)	Better for univariate analysis (10 year survival 47% *vs* 60%, p=0·02); NS for multivariate analysis (p=0·17)*	Intelligence quotients, no more sequelae‡

Expertises judiciaires

vs niveau de preuve scientifique

Comparison with malpractice claims

We did a retrospective, descriptive analysis of two nationwide databases of paediatric malpractice claims—namely, the Canadian Medical Protective Association (in Canada) and Le Sou Médical-Groupe MACSF (in France). The Canadian Medical Protective Association covers about 95% of physicians working in Canada, whereas the Sou Médical-Groupe MACSF covers about 60% of physicians working in France.

Expertises judiciaires

vs niveau de preuve scientifique

Question : Au Canada et en France, les conclusions des expertises judiciaires sur les conséquences des délais diagnostiques (en terme de morbidité ou de mortalité) sont concordantes avec les données de la littérature dans quel % de cas ?

- 75% :bras droit levé
- 50% :bras gauche levé
- 33% :aucun bras levé
- 25% : 2 bras levés

Expertises judiciaires

vs niveau de preuve scientifique

Reports about the consequences of delayed diagnosis were concordant with the medical literature available at the time of expert assessment in 18 cases (32%), discordant in 14 (25%), and not supported by published work in 24 (43%). We noted no significant difference between cases in Canada and those in France.

Expertises judiciaires

vs niveau de preuve scientifique

In 21 (38%) cases, the expert concluded that the delay had negative consequences, even though published evidence showed either no relation or an inverse relation between time to diagnosis and consequences (10 cases) or did not have data about consequences (11 cases).

Expertises judiciaires

vs niveau de preuve scientifique

This result raises questions about the scientific evidence that supports expert testimony and reports. In the USA, Canada,[111] and France,[112] experts are recommended to base their conclusions on evidence (ie, to adhere to the Daubert criteria), but they can also develop theories based on their experiences.

Complaints filed for delayed diagnosis might have additional issues (eg, alleged negligence by the treating doctor).

Expertises judiciaires

vs niveau de preuve scientifique

Furthermore, conclusions about the individual consequences of a specific delay in diagnosis might differ from those drawn from the analysis of a cohort of patients. For example, the 18th patient listed in the second table in the appendix died of intracranial hypertension before a biopsy of a third ventricle tumour was taken and treatment started. The medical expert in the case concluded that the diagnosis could have been made 2 months earlier and that this delay was the cause of death.

Delays in diagnosis of paediatric cancers: a systematic review and comparison with expert testimony in lawsuits

Jean-François Kremer*, Michèle Monfouroux*, Jacques Grill, Alain Monnier, Henri Amalberti, Catherine Raux-Lemoyne, Martin Chalumeau

Lancet Oncol 2012; 13: e445–59

Déterminants
des plaintes

Leu kem ia: 4

Brain tumors: 14

Neuroblastoma: 3

Non-Hodgkin lymph.: 4

Hodgkin lymph.: 7

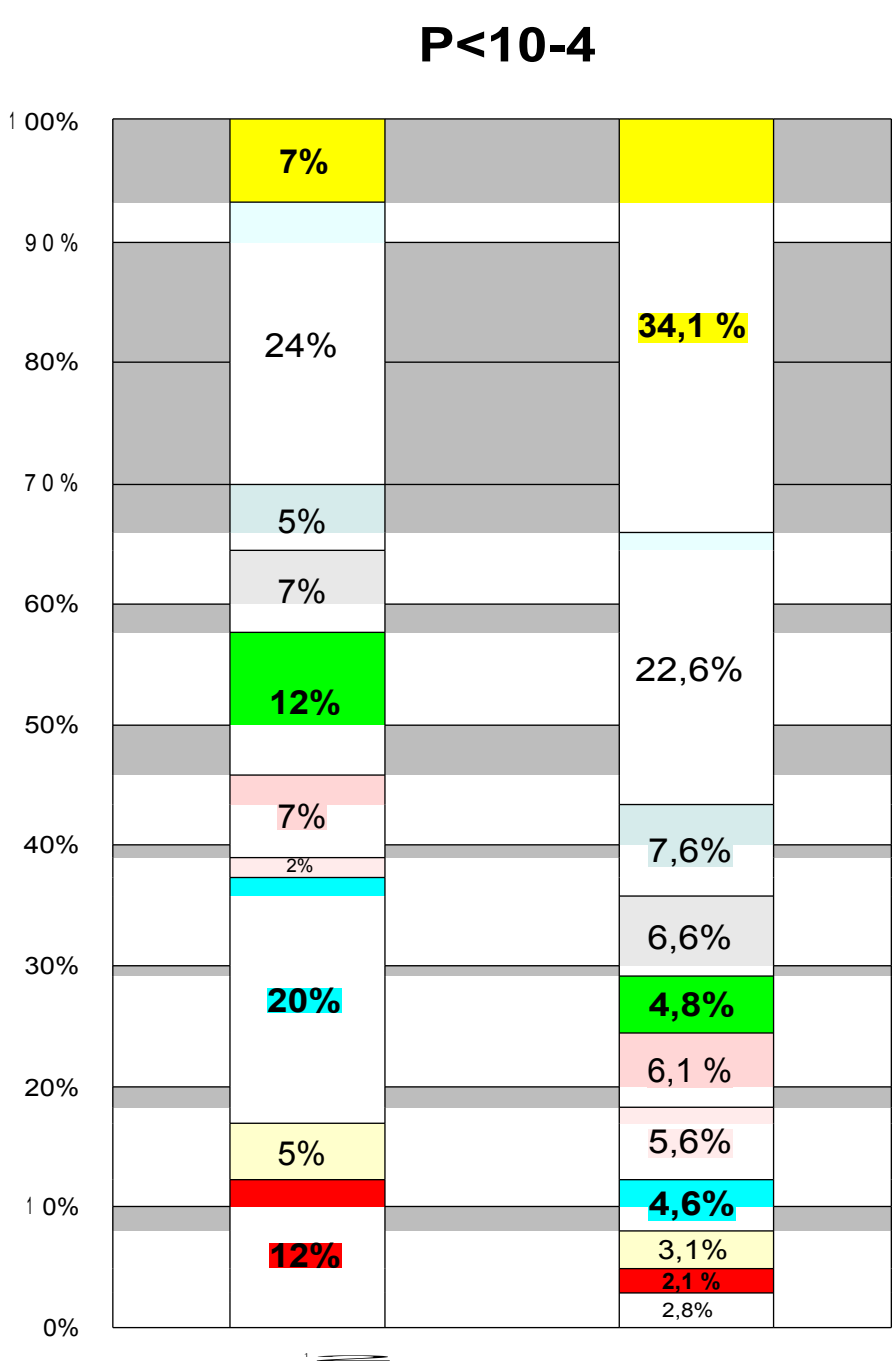
Soft-tissue sarcoma: 4

Renal tu mor: 1

Bone tumor: 12

Dysgerminoma: 3

Retinoblastoma: 7



Délais diagnostiques
et souffrance des enfants et des parents

Parents' accounts of obtaining a diagnosis of childhood cancer

Mary Dixon-Woods, Michelle Findlay, Bridget Young, Helen Cox, David Heney — *Lancet* 2001; **357:** 670–74

Parents as Advocates:
Stories of Surplus Suffering
When a Child Is Diagnosed and Treated
for Cancer

Juanne N. Clarke, PhD
Paula Fletcher, PhD

Social Work in Health Care

Conclusion (?) :
même si on ne met pas en évidence de relation entre délai diagnostique et outcome,
la réduction des délais diagnostiques est un objectif important pour réduire la souffrance des enfants et des parents.

Délais diagnostiques
et souffrance des médecins

The American Journal of Medicine (2005) 118, 435-438

THE AMERICAN JOURNAL of MEDICINE®

MEDICAL EDUCATION

52 precepts that medical trainees and physicians should consider regularly

Scott M. Wright, MD, David B. Hellmann, MD, Roy C. Ziegelstein, MD

Department of Medicine, Johns Hopkins Bayview Medical Center and the Johns Hopkins University School of Medicine.

Délais diagnostiques
et souffrance des médecins

When you have made a mistake in the care of a patient, follow these steps (n=6):

Délais diagnostiques
et souffrance des médecins

When you have made a mistake in the care of a patient, follow these steps:
(a)admit it,
(b) inform the patient,
(c) if possible, initiate reparation,
(d) institute a mechanism whereby you will not repeat the error,
(e) attempt to establish a mechanism whereby others in the system cannot make the error,
(f) **forgive yourself**

The American Journal of Medicine (2005) 118, 435-438

Délais diagnostiques
et souffrance (projet DIASTEM)

OBJECTIVE

Analyze the psychological consequences (frequency, dimensions, intensity, determinants and evolution) related to the symptomatic period before diagnosis with symptoms but before diagnosis in children with cancer, parents, and primary-care physicians.

POPULATION AND METHODS

General methodology

Observational study (non-interventional), multicenter, cross-sectional and prospective, qualitative and quantitative, with children, parents and physicians, in two steps:

- 1. construction and validation of a questionnaire using the focus groups method;
- 2. distribute the questionnaire to the target persons.

Inclusion criteria

Children older than 12 years of age, with a first cancer (solid tumor, lymphoma or leukemia).

Parent or parents of a child younger than 18 years old at diagnosis of a first cancer.

Primary-care physicians (general practitioners and pediatricians) who cared for a patient younger than 18 years with cancer, after the onset of symptoms but before diagnosis.

Appel à projets 2013

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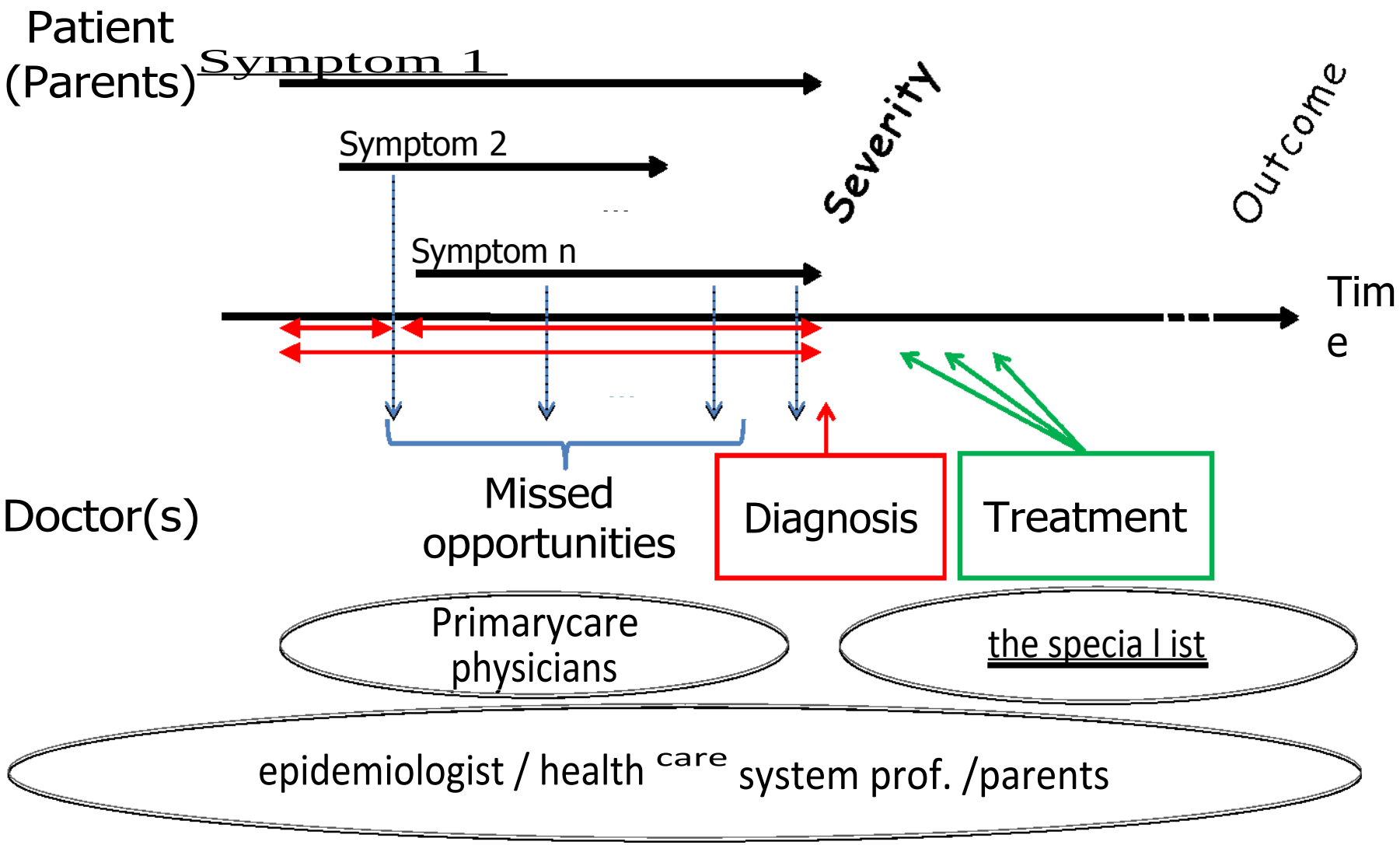
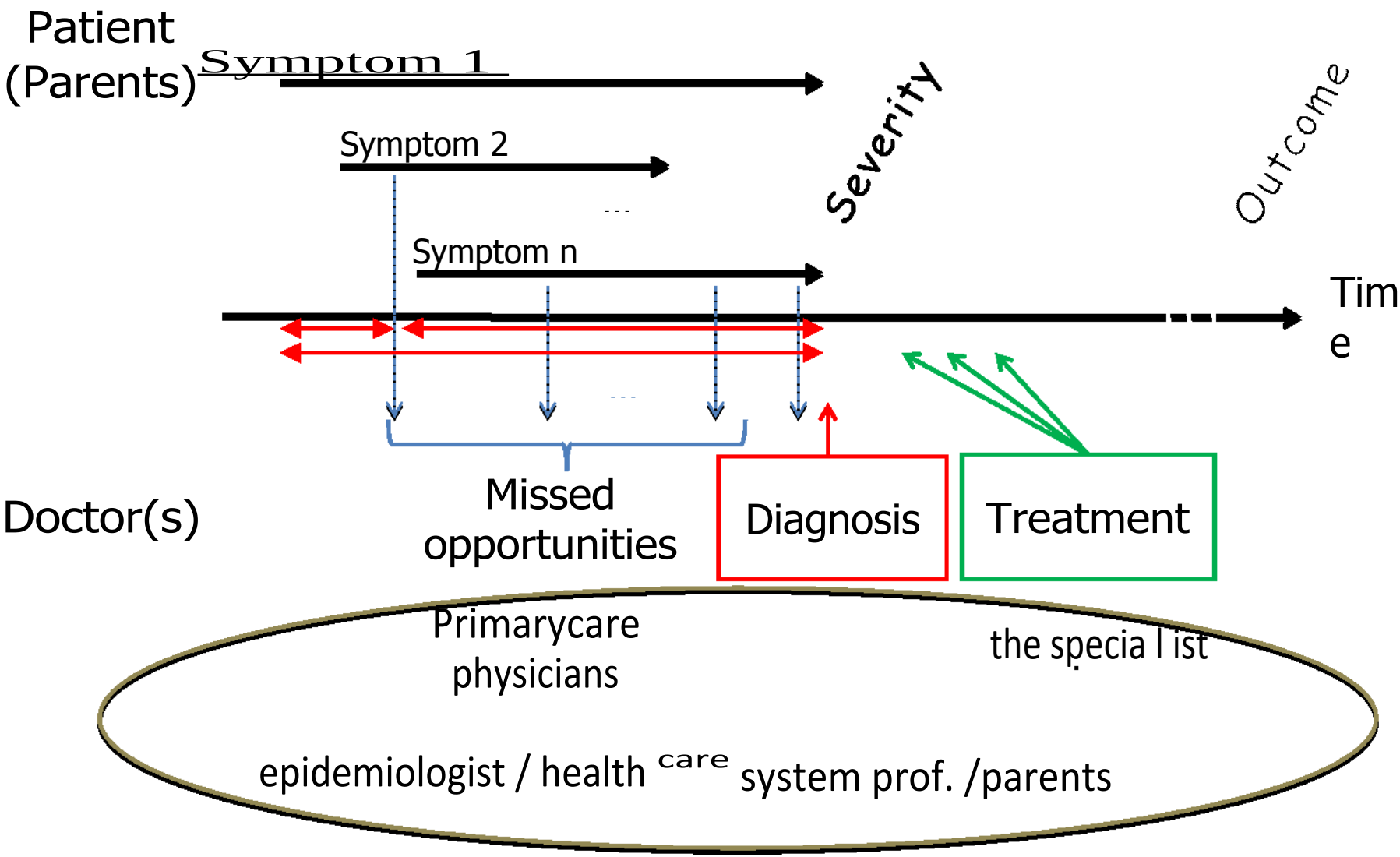
Projets libres de recherche
en Sciences Humaines et Sociales,
Epidémiologie et Santé Publique

Let’s work together?



Let’s work together?



Délais diagnostiques
en pédiatrie

Fréquent	caractéristiques de la population pédiatrique
Stressant	conséquences humaines et juridiques
Très douloureux	enfants et parents (+ médecins)
Compliqué àétudier	déterminants, conséquences

Plan d'action simple "ÿ a qu'à faut qu'on" :inadaptés

Solution (?) :
humilité, prudence et collégialité en clinique et recherche

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Le paradigme
de la médecine générale de l'enfant