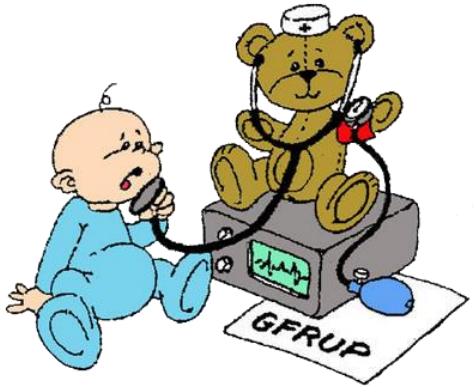


Mercredi 26 septembre 2018

GFRUP
Groupe Francophone de Réanimation et Urgences Pédiatriques

Journée de formation « médecin » et « infirmier »
Journée de Recherche du GFRUP

Usage(s) du Point of Care - Viraux et infectieux

Dr Aymeric Cantais

POC ? POCT ? TDR ? TROD ?

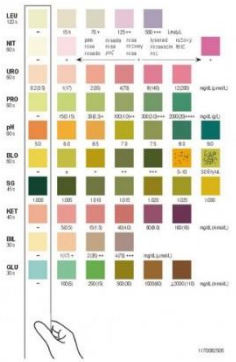
- Point-Of-Care (Test) & Test de Diagnostic rapide
  - Tests de laboratoire
  - Fabriqués sous forme permettant sa réalisation au lit du malade
  - Avec résultats immédiats (<30 mn/1h)
  - Par des personnels non biologistes ou technicien de biologie

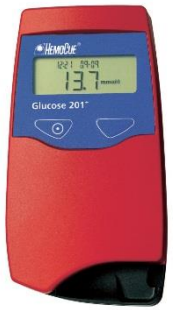
=> Capacité à modifier la prise en charge

POC non infectieux

Multiples, en médecine générale et/ou urgence polyvalentes

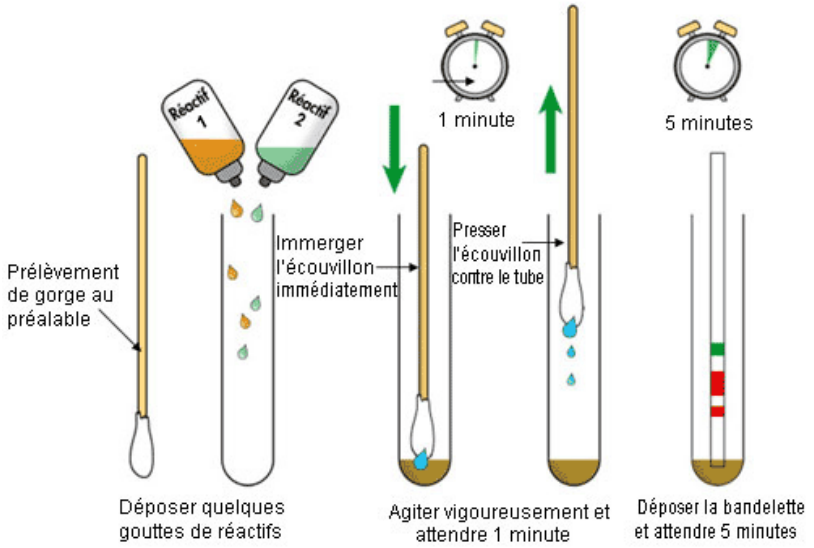
- Dextro
- HbA1C
- HCG
- INR/TP
- Ethanol
- Hemoccue
- GdS
- BU …



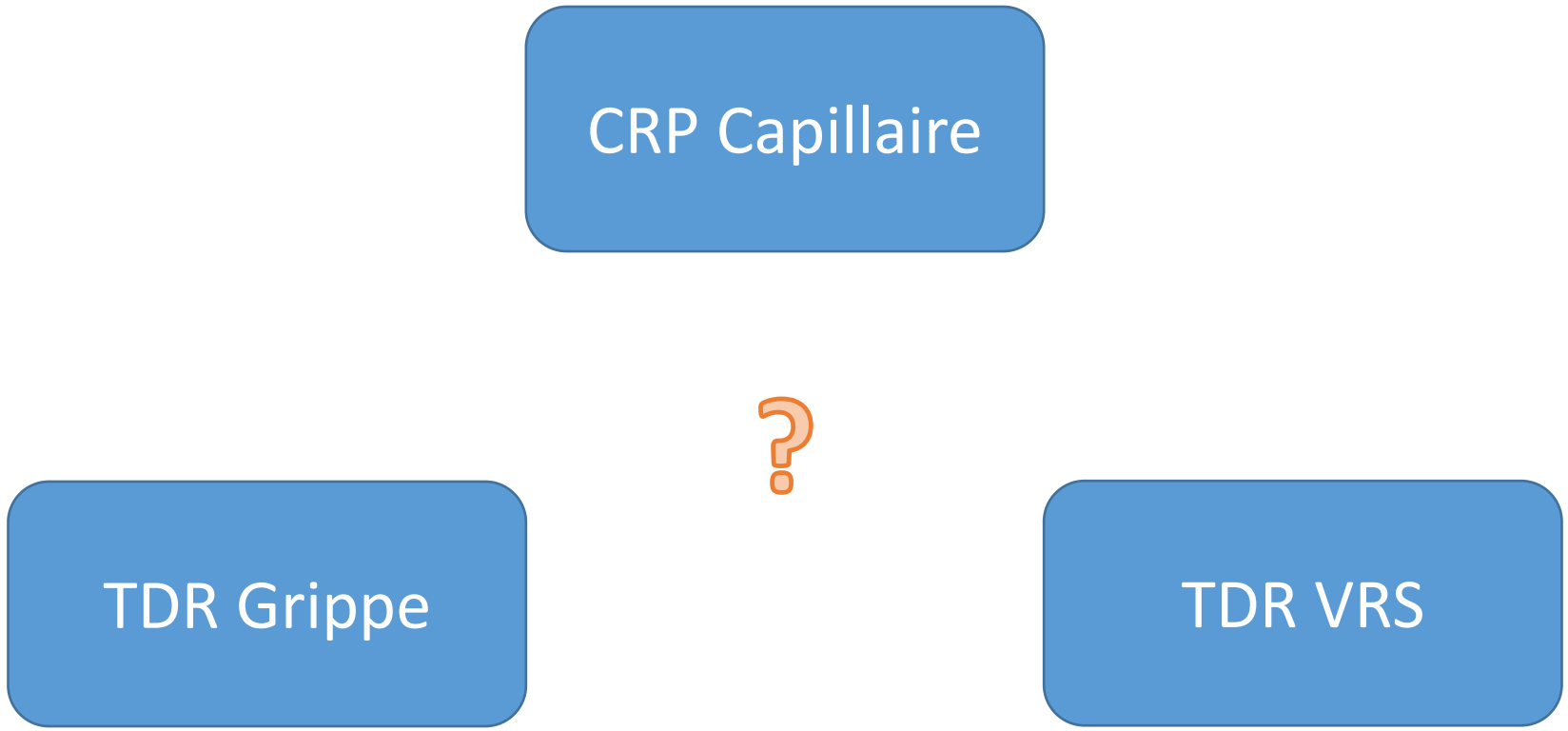


Strepto-Test

- « StreptoTest »
- Recherche d'antigènes du streptocoque béta hémolytique du groupe A
- Dans les angines :
  - orientation étiologique difficile
  - Sanction thérapeutique
  - Epargne antibiotique



Humair J, Revaz SA, Bovier P, Stalder H. Management of Acute Pharyngitis in Adults Reliability of Rapid Streptococcal Tests and Clinical Findings. *Arch Intern Med.* 2006;166(6):640–644. doi:10.1001/archinte.166.6.640


CRP Capillaire
?
TDR Grippe
TDR VRS

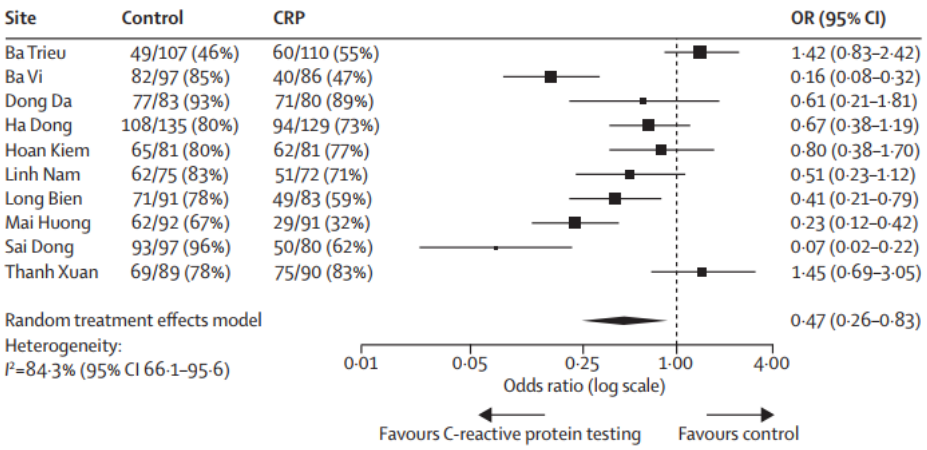
CRP Capillaire

Intérêt : Epargne antibiotique

Point-of-care C-reactive protein testing to reduce inappropriate use of antibiotics for non-severe acute respiratory infections in Vietnamese primary health care: a randomised controlled trial

Nga T T Do, Ngan T D Ta, Ninh T H Tran, Hung M Than, Bich T N Vu, Long B Hoang, H Rogier van Doorn, Dung T V Vu, Jochen W L Cals, Arjun Chandna, Yoel Lubell, Behzad Nadjm, Guy Thwaites, Marcel Wolbers, Kinh V Nguyen, Heiman F L Wertheim

	CRP	Control	OR (95% CI)	p value
Immediate antibiotic prescription				
All patients	441/1017 (43·4%)	647/1019 (63·5%)	0·41 (0·34–0·49)	<0·0001
Children	227/510 (44·5%)	333/518 (64·3%)	0·39 (0·30–0·52)	<0·0001
Adults	214/507 (42·2%)	314/501 (62·7%)	0·40 (0·30–0·52)	<0·0001



Do NT, Ta NT, Tran NT, Wertheim HF. Point-of-care C-reactive protein testing to reduce inappropriate use of antibiotics for non-severe acute respiratory infections in Vietnamese primary health care: a randomised controlled trial. Lancet Glob Health. 2016 Sep;4(9):e633-41. doi: 10.1016/S2214-109X(16)30142-5

CRP Capillaire

Intérêt : Optimisation de la prise en charge

Ann Biol Clin (Paris). 2018 Oct 1;76(5):545-552. doi: 10.1684/abc.2018.1378.

Evaluation of the capillary assay of C-reactive protein (CRP) through the lenght of consultation in pediatric emergencies and its economic impact.

Roulliaud M[1], Pereira B[2], Cosme J[3], Mourgues C[2], Sarret C[1], Sapin V[3], Caron N[1], Bouvier D[3].

antibiothérapie) et biologique (valeurs de CRP), l'intérêt de la CRP délocalisée a été évaluée. Dans le groupe CRP rapide, versus le groupe contrôle, une baisse significative sur les médianes du temps de consultation aux urgences (60 (IQR 33-125) versus 180 (IQR 158-208) minutes), du nombre d'actes de biologie par patient (1 (IQR 1-3) versus 7 (IQR 3-8)), du coût des examens complémentaires facturés par patient (5,4 (IQR 5,4-32,6) versus 153,8 (IQR 46,9-180,4) euros), et du coût des réactifs dépensés par le laboratoire par patient (5,2 (IQR 5,2-6,4) versus 33,2 (IQR 2,3-34,2) euros). Ainsi, dans le cadre

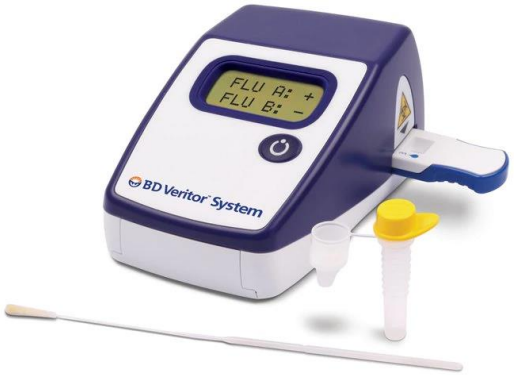
Roulliaud M, Pereira B, Cosme J, Mourgues C, Sarret C, Sapin V, Caron N, Bouvier D. Evaluation of the capillary assay of C-reactive protein (CRP) through the lenght of consultation in pediatric emergencies and its economic impact. Ann Biol Clin (Paris). 2018 Oct 1;76(5):545-552

C-Reactive Protein Bedside Testing in Febrile Children Lowers Length of Stay at the Emergency Department

Ruud G. Nijman, MD, Henriëtte A. Moll, MD, PhD,* Yvonne Vergouwe, PhD,† Yolanda B. de Rijke, PhD,‡ and Rianne Oostenbrink, MD, PhD**

Results: The preimplementation cohort included 609 children of whom 286 (47%) had traditional CRP. The postimplementation cohort included the following 1330 children: 728 (55%) children had bedside CRP and 156 (12%) children had traditional CRP. Bedside CRP significantly lowered the median LOS of children in whom an additional diagnostic CRP test was performed, from 178 minutes (interquartile range, 135–232 minutes) to 148 minutes (interquartile range, 108–200 minutes) (30 minutes, 19% of total LOS). A significant reduction of 15% of the (log)LOS remained after adjusting for other determinants of (log)LOS; propensity score analysis showed a 16% reduction.

Nijman RG, Moll HA, Vergouwe Y, de Rijke YB, Oostenbrink R. C-Reactive Protein Bedside Testing in Febrile Children Lowers Length of Stay at the Emergency Department. Pediatr Emerg Care. 2015 Sep;31(9):633-9



TDR Grippe

Les TDR Grippe (RIDT), un long chemin …

Rationnel :

- Epargne examens complémentaires inutiles
- Diminue durée de séjour
- Tri des patients aux urgences
- Diminue hospitalisations inutiles
- Permet traitement précoce …

CDC Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Advantages and Disadvantages of RIDTs

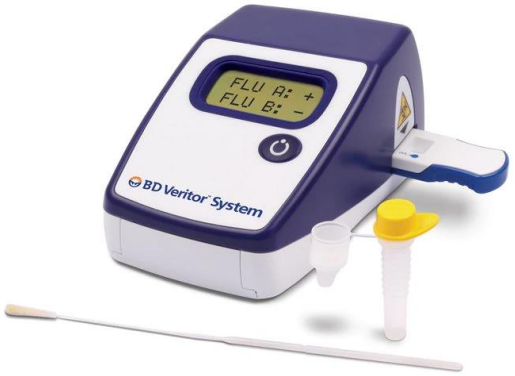
Advantages

- Produce quick result in less than approximately 15 minutes, simple to perform
- Some RIDTs are cleared for office/bedside use. RIDTs that have been CLIA waived can be used in settings that include point-of-care.

Disadvantages

- Sub-optimal test sensitivity, false negative results are common, especially when influenza activity is high
- Sensitivity of RIDTs to detect influenza B viral antigens is lower than for detection of influenza A viral antigens.
- Although specificity is high, false positive results can also occur, especially during times when influenza activity is low.
- Some RIDTs distinguish between influenza A or B viruses while others do not. RIDTs that provide results on the type of influenza virus (e.g., influenza A or B virus), do not provide information on influenza A virus subtype [e.g., A(H1N1)pdm09 versus A(H3N2)] or specific virus strain information (e.g., degree of similarity to vaccine strains). RIDTs cannot distinguish between seasonal influenza A virus infection and novel influenza A virus infection (due to infection with avian or variant influenza A viruses).

- Sensitivities of RIDTs are generally approximately 50-70%, but a range of 10-80% has been reported compared to viral culture or RT-PCR. Specificities of RIDTs are approximately 90-95% (range 85-100%). Thus false negative results occur more commonly than false positive results.



Les TDR Grippe (RIDT), un long chemin …

TDR Grippe

Impact of rapid influenza diagnostic test on physician estimation of viral infection probability in paediatric emergency department during epidemic period

Sylvie Lacroix[a,*], Bénédicte Vrignaud[a], Estelle Avril[a], Anne Moreau-Klein[b], Marianne Coste[b], Elise Launay[c,d], Christelle Gras-Le Guen[a,c,d]

Journal of Clinical Virology 72 (2015) 141–145

Table 3
Impact of RIDT on prescriptions.

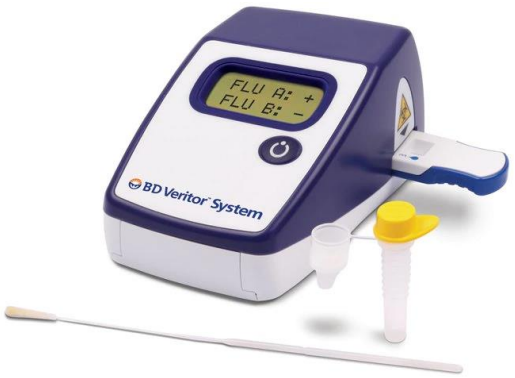
	Post clinical examination $N = 170$ (%)	Post RIDT $N = 170$ (%)	Post RIDT+ $N = 80$ (%)	Post RIDT− $N = 90$ (%)
Laboratory tests	133 (78.2)	70 (41.1)*	6 (7.5)**	64 (71.1)
Chest radiographs	113 (66.4)	78 (45.8)*	20 (25.0)**	58 (64.4)
Urine dipstick	112 (65.8)	53 (31.2)*	6 (7.5)**	47 (52.2)
Antibiotic		37 (21.7)	4 (5.0)	33 (36.6)
Oseltamivir	2 (1.1)	4 (2.3)	4 (5.0)	0 (0.0)
Hospitalization	39 (22.9)	29 (17.0)	11 (13.7)	18 (20.0)

* $p < 0.05$ versus total population after the clinical examination.
** $p < 0.0005$ versus total population after the clinical examination.

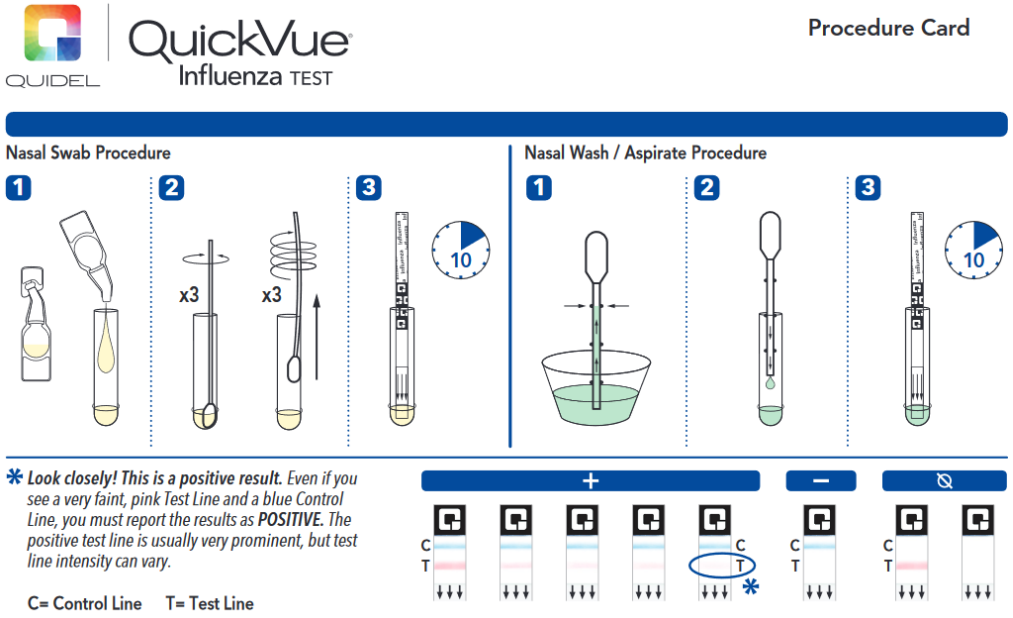
The RIDT used was Quikvue influenza® test (Quidel Corporation, San Diego, California). The test is based on an immunochromatography technique and can be easily performed at the bedside, with results available within 10 min. All the nasopharyngeal swabs were tested with RIDT and with laboratory test: viral culture-direct fluorescent antigen and RT-PCR (gold standard). The laboratory test was considered positive if one laboratory test indicated influenza. Rodriguez et al. reported in 2002 the performance characterisitics of Quickvue influenza® test in pediatrics. His sensitivity was 73% and his specificity was 95–99%.

QUIDEL | QuickVue Influenza A+B TEST

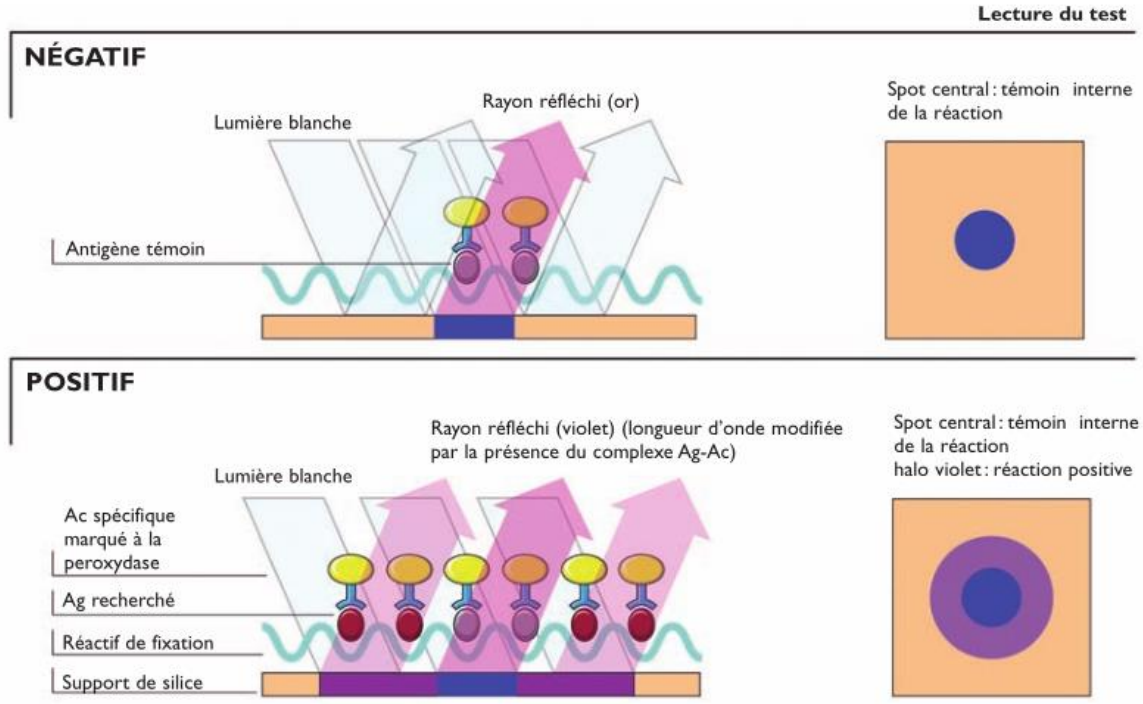
TDR Grippe



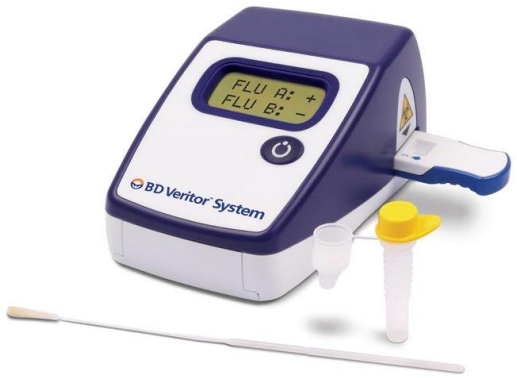
RIDT V1.0 versus RIDT V2.0 (=> DIA)



Traditional RIDT (1st generation)



DIA (RIDT 2nd generation)



Les TDR Grippe (RIDT), un long chemin …

TDR Grippe

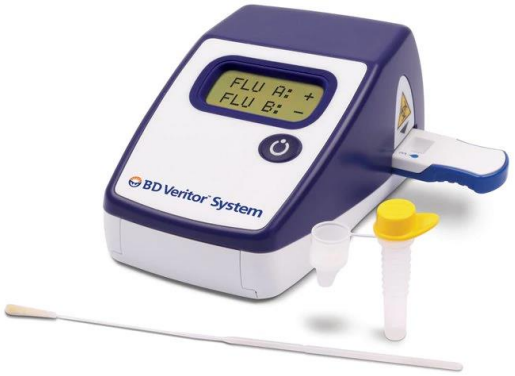
Annals of Internal Medicine REVIEW

Diagnostic Accuracy of Novel and Traditional Rapid Tests for Influenza Infection Compared With Reverse Transcriptase Polymerase Chain Reaction

A Systematic Review and Meta-analysis

Joanna Merckx, MD, MSc; Rehab Wali, BSc, MBBS; Ian Schiller, MSc; Chelsea Caya, MScPH; Genevieve C. Gore, MLIS; Caroline Chartrand, MD, MSc; Nandini Dendukuri, PhD; and Jesse Papenburg, MD, MSc

Index Test Type	Influenza A		Influenza B	
	Pooled Sensitivity (95% CrI), %	Pooled Specificity (95% CrI), %	Pooled Sensitivity (95% CrI), %	Pooled Specificity (95% CrI), %
Study population (age)‡				
Traditional RIDTs				
Children (31 influenza A studies; 9 influenza B studies)	61.2 (55.0 to 67.2)	99.2 (98.5 to 99.7)	65.7 (45.3 to 80.5)	99.6 (99.2 to 99.8)
Adults (23 influenza A studies; 5 influenza B studies)	42.6 (34.8 to 50.9)	99.5 (98.6 to 99.8)	33.2 (19.9 to 50.7)	99.9 (99.4 to 100)
Difference in RIDT sensitivity: children vs. adults	**18.5 (8.4 to 28.3)**	–	**31.8 (6.1 to 52.6)**	–
DIAs				
Children (11 influenza A studies; 11 influenza B studies)	87.6 (81.8 to 92.2)	98.1 (96.4 to 99.1)	82.5 (71.2 to 90.2)	98.8 (95.6 to 99.7)
Adults (8 influenza A studies; 7 influenza B studies)	75.4 (66.6 to 82.6)	96.7 (94.7 to 98.0)	57.0 (39.5 to 71.6)	98.8 (97.5 to 99.5)
Difference in DIA sensitivity: children vs. adults	**12.1 (3.1 to 22.1)**	–	**25.3 (6.9 to 44.7)**	–
Rapid NAATs				
Children (4 influenza A studies; 4 influenza B studies)	90.2 (79.2 to 95.8)	99.0 (96.8 to 99.8)	95.9 (82.9 to 99.2)	99.5 (98.2 to 99.9)
Adults (4 influenza A studies; 4 influenza B studies)	87.4 (71.1 to 95.6)	98.0 (93.2 to 99.5)	75.7 (51.8 to 90.7)	99.3 (97.8 to 99.8)
Difference in NAAT sensitivity: children vs. adults	2.7 (−10.7 to 19.7)	–	**19.5 (1.0 to 43.7)**	–



Les TDR Grippe (RIDT), un long chemin …

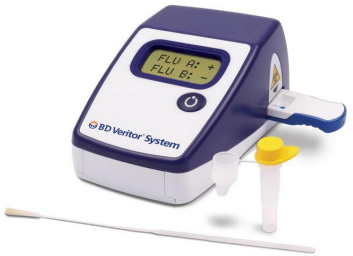
TDR Grippe

Medico-economic impact of the bedside diagnosis of influenza in the paediatric emergency ward

Etude monocentrique CHU de St Etienne, **514** enfants, comparés à une cohorte rétrospective des 3 dernières années + déclaratif intention post examen clinique

11 faux positifs, 10 faux négatifs :

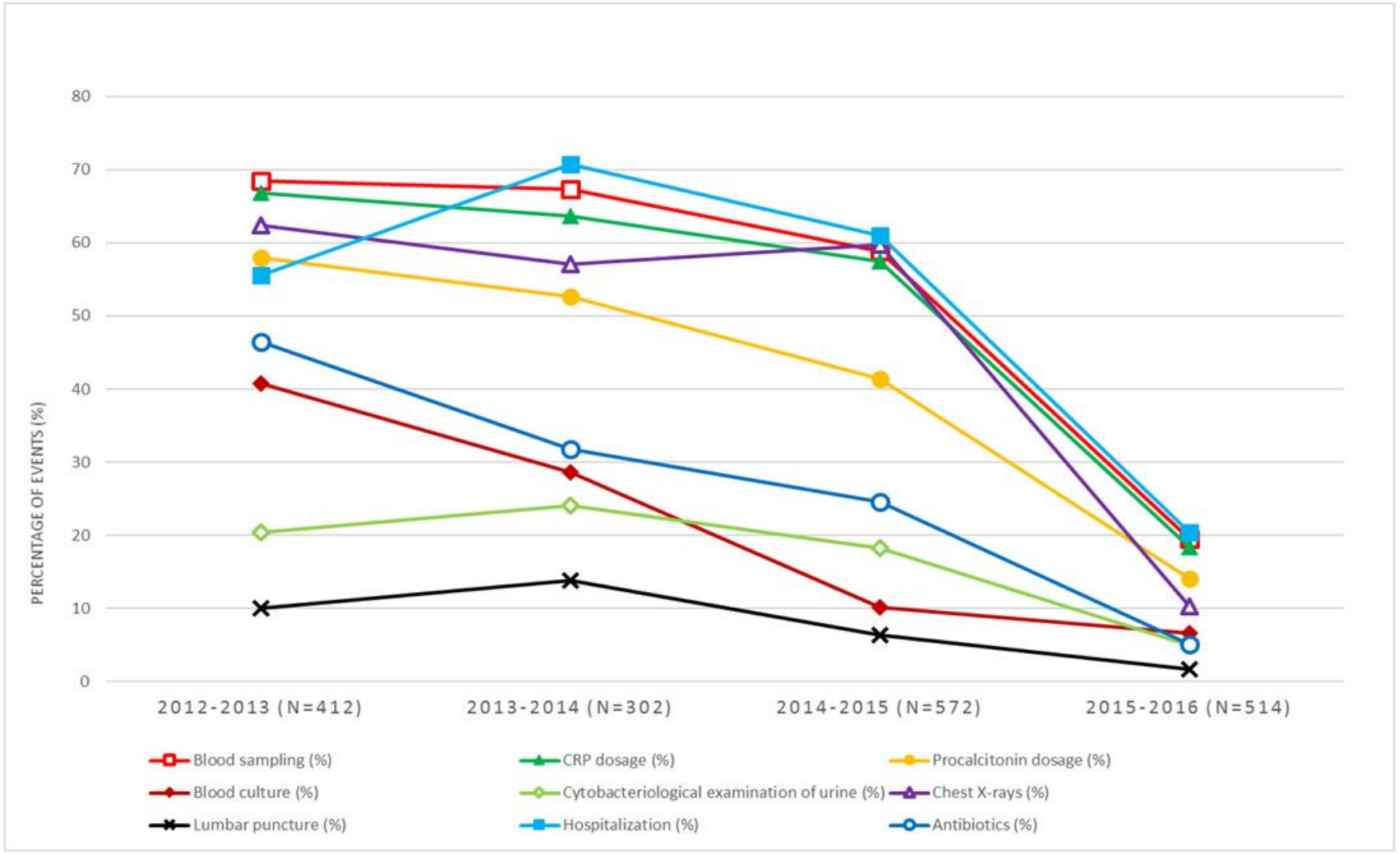
- Sensibilité 95,6 %
- Spécificité 95,2 %

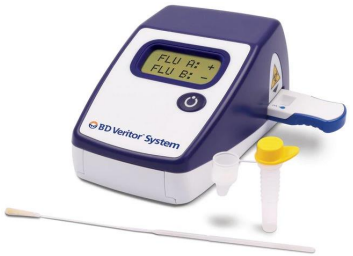


Les TDR Grippe (RIDT), un long chemin …

Medico-economic impact of the bedside diagnosis of influenza in the paediatric emergency ward

TDR Grippe





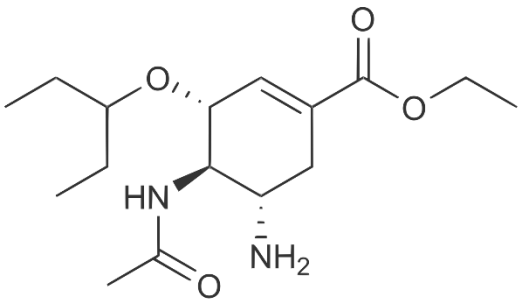
Les TDR Grippe (RIDT), un long chemin …

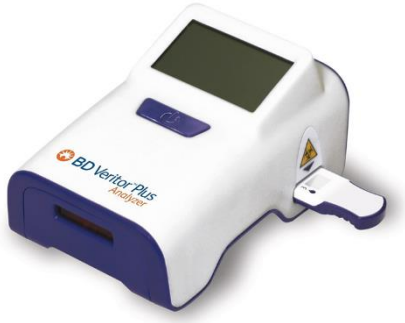
Medico-economic impact of the bedside diagnosis of influenza in the paediatric emergency ward

TDR Grippe

?

Usage du tamiflu hyperprécoce avec TDR ?





TDR VRS

Quel intérêt ?

Bronchiolite

=

VRS

=

Pas de traitement spécifique

80 %

Bamberger E, Srugo I, Abu Raya B, Segal E, Chaim B, Kassis I, Kugelman A, Miron D. What is the clinical relevance of respiratory syncytial virus bronchiolitis?: findings from a multi-center, prospective study. Eur J Clin Microbiol Infect Dis. 2012 Dec;31(12):3323-30. doi: 10.1007/s10096-012-1699-2. Epub 2012 Jul 24.

TDR VRS

Quel intérêt ?

Impact potentiel de l'identification du virus ?

⇒ Cohorting probabiliste chez les enfants hospitalisés

- Regrouper les bronchiolites VRS dans un secteur de soins distinct des bronchiolites « non VRS » afin d'éviter une « deuxième bronchio nosocomiale » aux enfants qui étaient VRS négatifs.
- On protège les enfants VRS neg (20%)

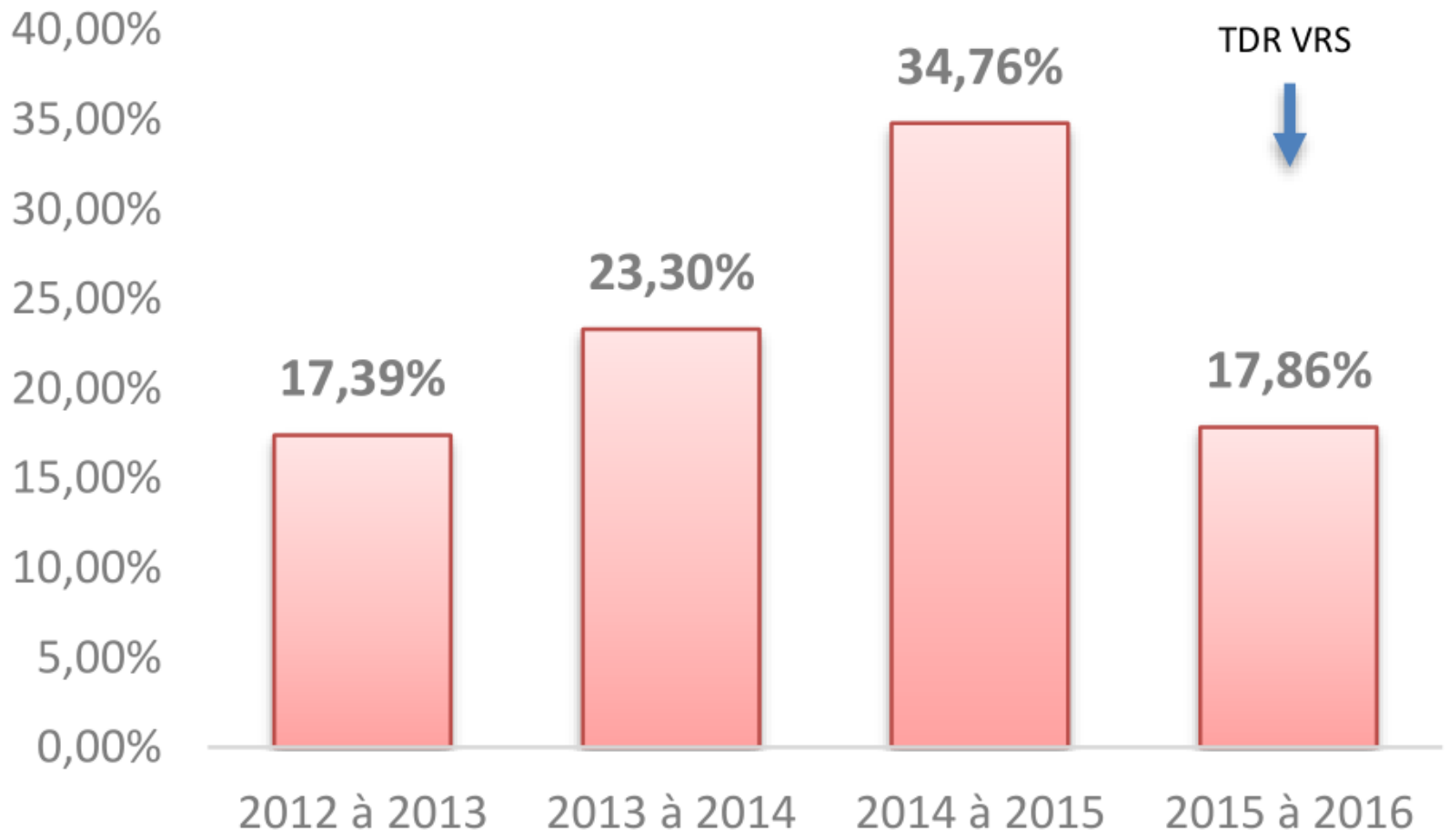
Problématique :

- Réponse au test viral dès les urgences avant hospitalisation en service

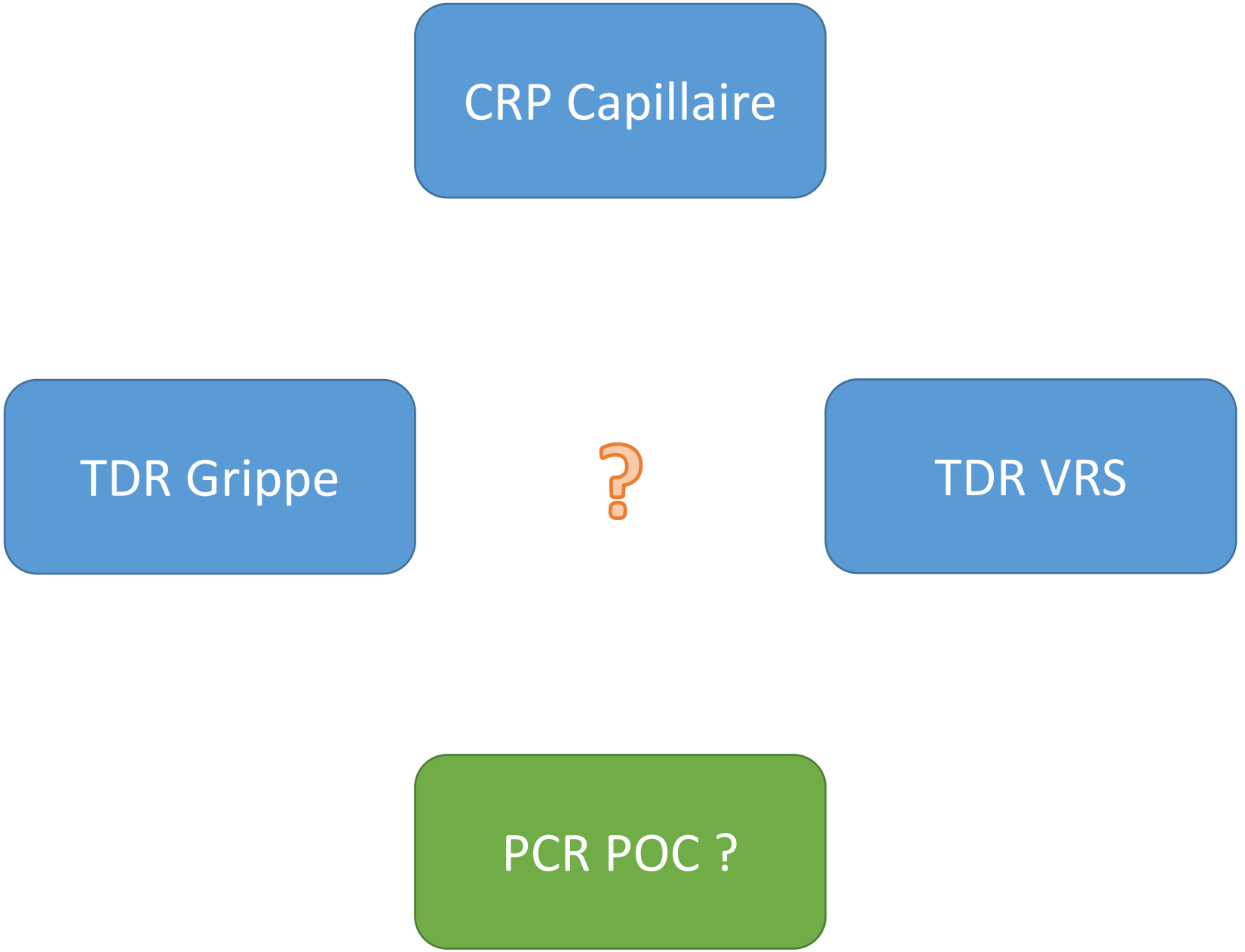
=> POC

TDR VRS

Quel intérêt ?

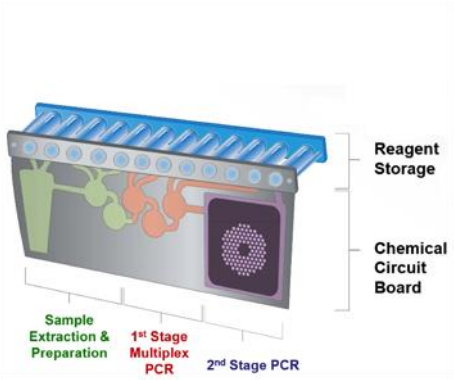


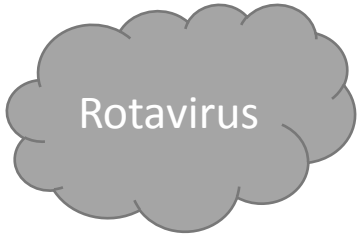
Les sensibilité, spécificité, valeur prédictive négative et valeur prédictive positive ont été respectivement de **97,6 ; 90,3 ; 87,5 et 98,2%.**

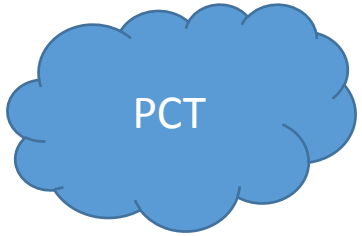

CRP Capillaire
TDR Grippe
?
TDR VRS
PCR POC ?

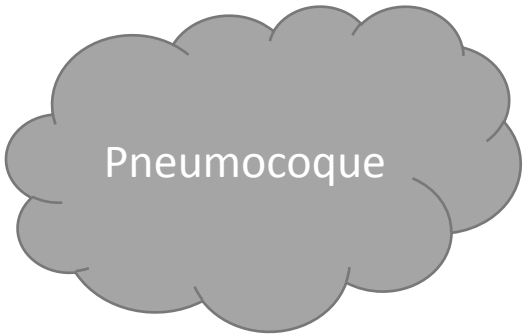
PCR POC ?

- Plus de la recherche dans certains centres
  - Se/Sp parfaite (gold standard)
  - Multiplexe
  - Systèmes POC
    - Pas d'entretien
    - Pas de personnel dédié
    - Systèmes automatisés
    - Résultats <1h
  - Coûts …









Autres POC ?