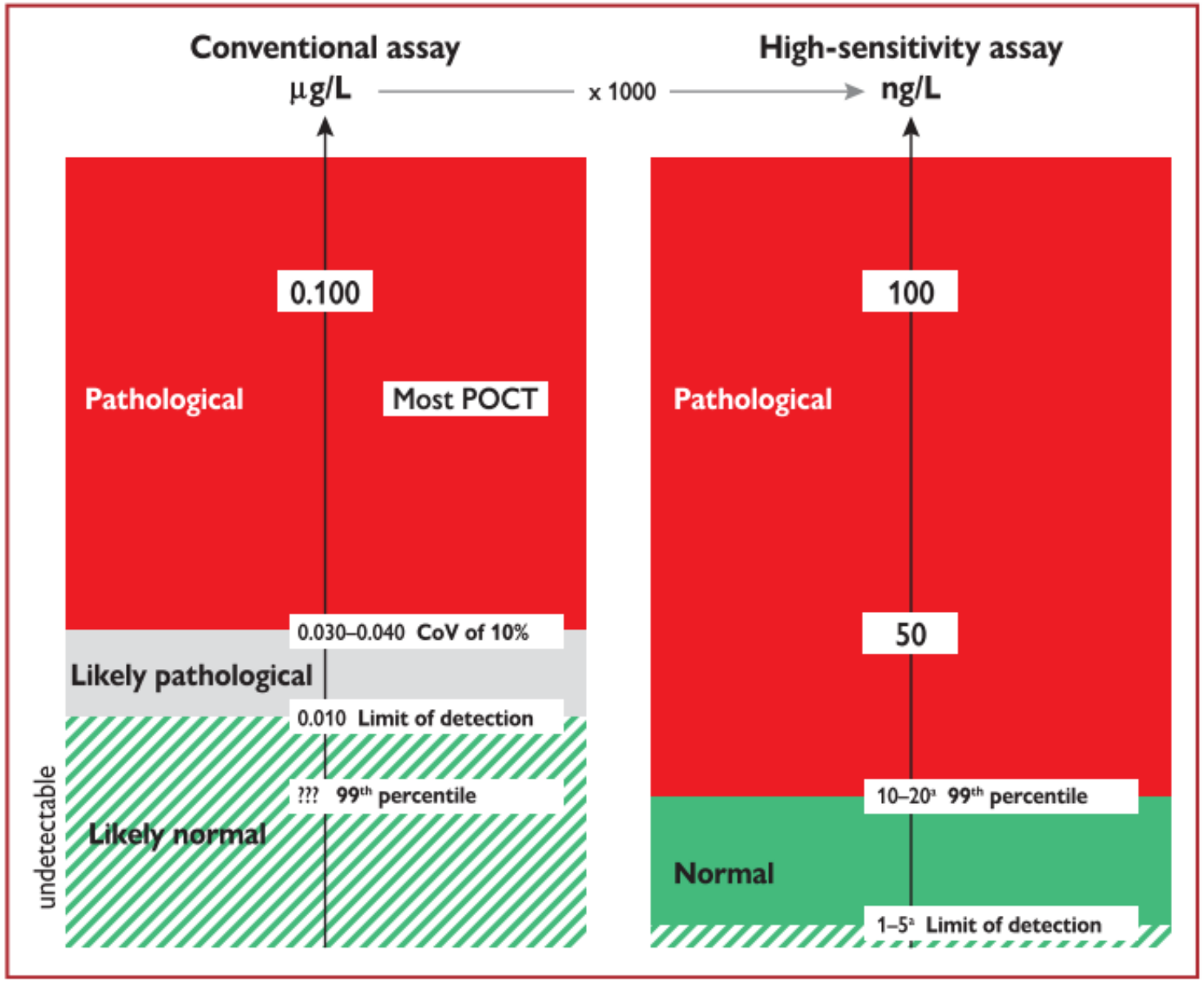
Les nouvelles guidelines de la Société européenne de Cardiologie sont-elles applicables d'un point de vue analytique ?

Corata 29/09/22

Ph. Lamtiri Mouhsine *Assistant en biologie clinique*
Dr. Sqalli Ghali *Assistant en biologie clinique*

Troponine Ultrasensible



ESC European Society of Cardiology
European Heart Journal (2019) 40, 237–269
doi:10.1093/eurheartj/ehy462
EXPERT CONSENSUS DOCUMENT

Fourth universal definition of myocardial infarction (2018)

Kristian Thygesen* (Denmark), Joseph S. Alpert* (USA), Allan S. Jaffe (USA), Bernard R. Chaitman (USA), Jeroen J. Bax (The Netherlands), David A. Morrow (USA), Harvey D. White* (New Zealand): the Executive Group on behalf of the Joint European Society of Cardiology (ESC)/American College of Cardiology (ACC)/ American Heart Association (AHA)/World Heart Federation (WHF) Task Force for the Universal Definition of Myocardial Infarction

Acute myocardial infarction (AMI) defines cardiomyocyte necrosis in a clinical setting consistent with acute myocardial ischaemia. **A combination** of criteria is required to meet the diagnosis of AMI, namely the **detection of an increase and/or decrease of a cardiac bio-marker**, preferably high-sensitivity cardiac troponin (hs-cTn) T or I, **with at least one value above the 99th percentile of the upper** reference limit and at least **one of the following:**

a. Symptoms of myocardial ischaemia.

b. New ischaemic ECG changes.

c. Development of pathological Q waves on ECG.

d. Imaging evidence of loss of viable myocardium or new regional wall motion abnormality in a pattern consistent with an ischaemic etiology.

e. Intracoronary thrombus detected on angiography or autopsy.

Elévation «aspécifique»

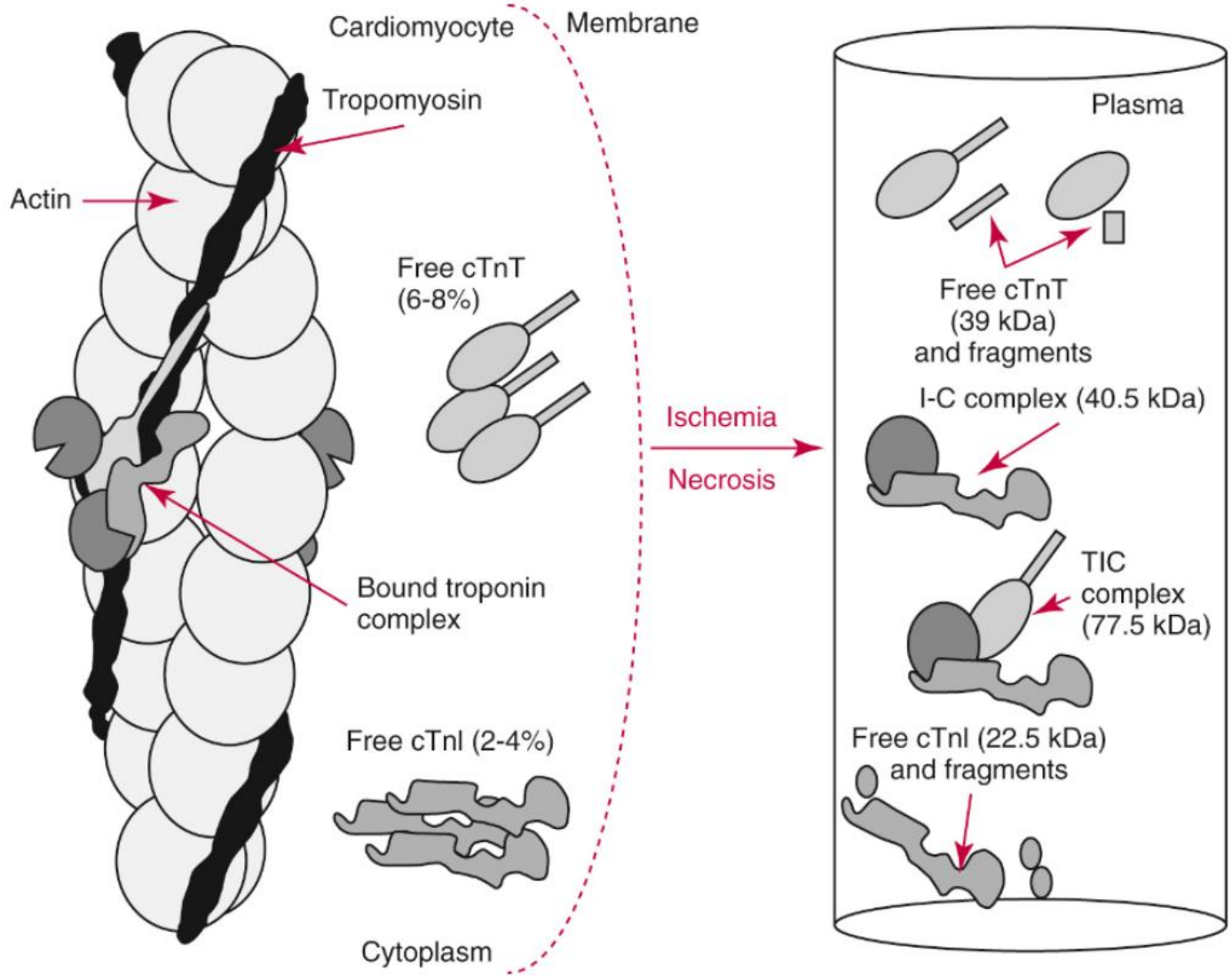
Box 58.1
Elevation of Troponins Without Overt Ischemic Heart Disease

- Trauma (including contusion, ablation, pacing, and cardioversion)
- Congestive heart failure—acute and chronic
- Aortic valve disease and hypertrophic cardiomyopathy with significant left ventricular hypertrophy
- Hypertension
- Hypotension, often with arrhythmias
- Postoperative noncardiac surgery patients who seem to do well
- Renal failure
- Critically ill patients, especially those with diabetes, respiratory failure
- Drug toxicity (eg, Adriamycin, 5-fluorouracil, herceptin, snake venoms)
- Hypothyroidism
- Coronary vasospasm, including apical ballooning syndrome
- Inflammatory disease (eg, myocarditis, parvovirus B19, Kawasaki's disease, sarcoid, smallpox vaccination)
- Post–percutaneous intervention patients whose condition appears to be uncomplicated
- Pulmonary embolism, severe pulmonary hypertension
- Sepsis
- Burns, especially if total body surface area is greater than 30%
- Infiltrative disease, including amyloidosis, hemochromatosis, sarcoidosis, and scleroderma
- Acute neurologic disease, including cerebrovascular accident, subarachnoid bleeds
- Rhabdomyolysis with cardiac injury
- Transplant vasculopathy
- Vital exhaustion

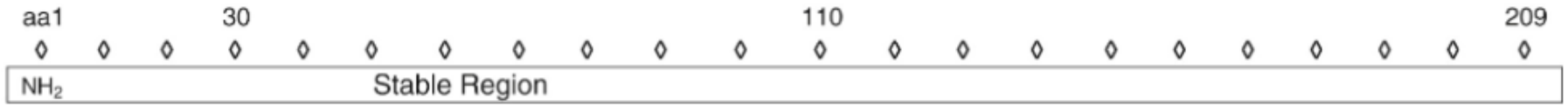
Tietz Textbook of Clinical Chemistry and Molecular Diagnostics
SIXTH EDITION
NADER RIFAI, PhD

L'élévation de la troponine **est spécifique d'une lésion myocardique** mais **n'est pas nécessairement une conséquence d'une maladie coronarienne.**

CARDIOMYOLYSE



EPITOPES



Central Lab						
Abbott Architect		C:24-40	D:41-49		C:87-91	
Beckman Access		D:24-40	C:41-49			
bioMerieux Vidas		C:22-29			D:87-91	
Ortho Vitros ECi		C:24-40	C41-49		D:87-91	
Siemens Centaur Ultra		D:27-40	C:41-49		C:87-91	
Siemens Dimension RxL		C:27-32	C:41-56			
Siemens VISTA		C:27-32	D:41-56			
Tosoh AIA II			C:41-49		D:87-91	
POC Assays						
Abbott i-STAT		D:28-39	C:41-49	D:62-78	C:88-91	
Alere Triage	C:NA	D:27-40				
Alere Triage Cardio3*		C:27-39			D:83-93	C:190-196
Mitsubishi Pathfast			C:41-49	D:71-116		D:163-209
Radiometer AQT90*			C:41-49		D:137-149	C:190-196
Response RAMP		D:26-38			C:85-92	C:190-196
Siemens Stratus-CS		C:27-32	D:41-56			
Trinity Meritas		C:24-40	D:41-49		C:88-90	D:137-148	D:190-196
High Sensitivity						
Abbott Architect		C:24-40	D:41-49			
Beckman Access		D:24-40	C:41-49			
Singulex Errena		D:27-41	C:41-49			
Siemens VISTA		C:30-35	D:41-56			D:171-190

Rapid « rule-in » and « rule-out » algorithms

- Protocoles pour **rapidement exclure l'IAM pour un maximum de patients**
- Trois types :

1. Rapid rule out basés sur valeurs de TN et sur les delta : **ESC 0/1h et 0/2h**
2. Basés sur les scores de risques et prédiction de risque cardiaque à court terme
3. Combinaison des deux : **ESC 0/3h**

Recommandations ESC2020

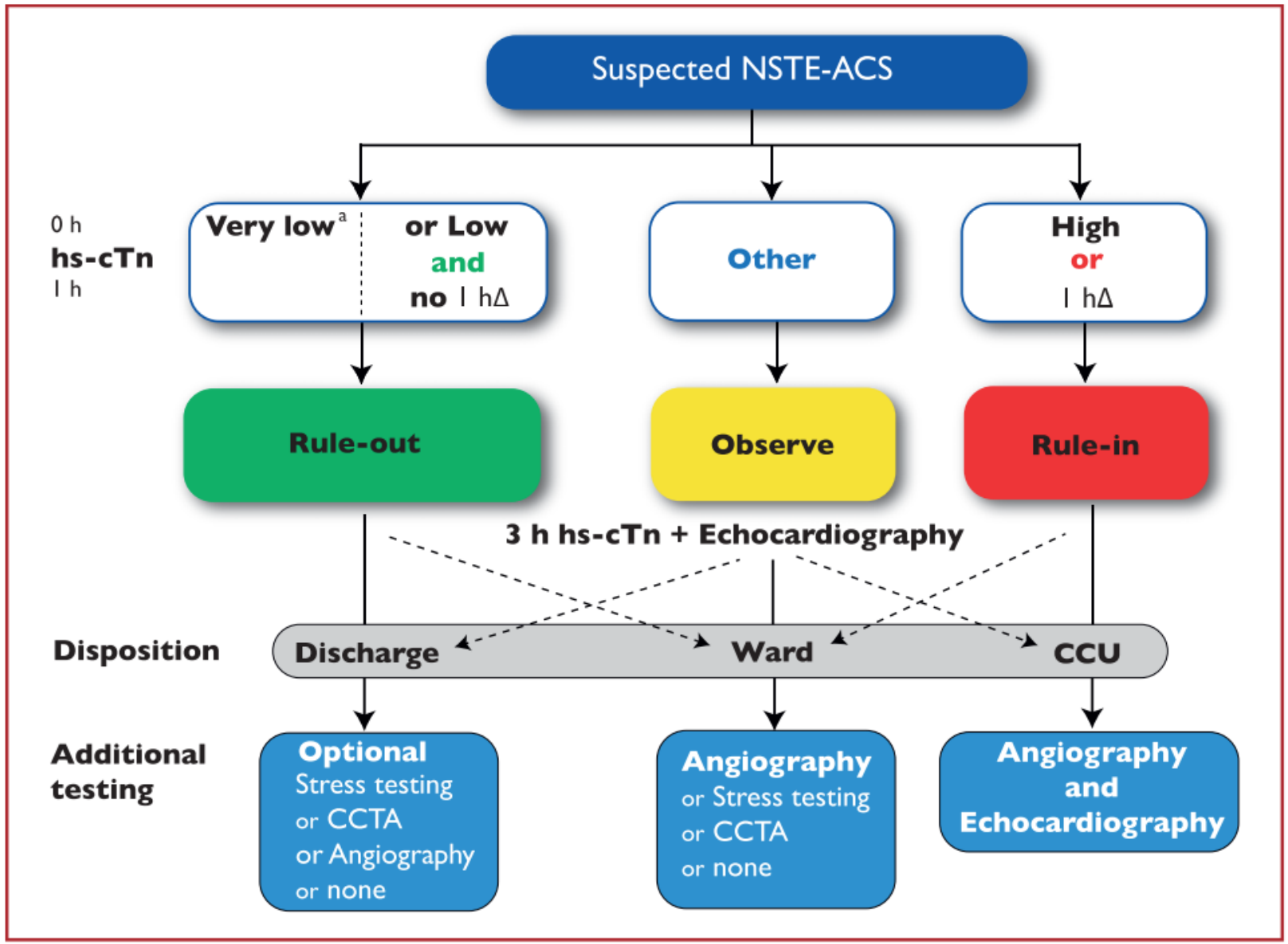
- **<u>Choix de l'algorithme:</u>**

1. 0h/1h « Best choice »
2. 0h/2h « Second best choice »
3. 0h/3h Alternative

- **<u>Troponine :</u>** T ou I
- **<u>Deux conditions:</u>**

1. Rule-in ⇔ Valeur prédictive positive **(VPP) > 70%**
2. Rule-out ⇔ Valeur prédictive négative **(VPN) > 99%**

ESC Guidelines : 0/1h algorithme



Δ | Hs-cTn |

Assay specific cut-off levels in ng/l within the 0 h/1 h and 0 h/2 h algorithms

0 h/1 h algorithm	Very low	Low	No 1hΔ	High	1hΔ
hs-cTn T (Elecsys; Roche)	<5	<12	<3	≥52	≥5
hs-cTn I (Architect; Abbott)	<4	<5	<2	≥64	≥6
hs-cTn I (Centaur; Siemens)	<3	<6	<3	≥120	≥12
hs-cTn I (Access; Beckman Coulter)	<4	<5	<4	≥50	≥15
hs-cTn I (Clarity; Singulex)	<1	<2	<1	≥30	≥6
hs-cTn I (Vitros; Clinical Diagnostics)	<1	<2	<1	≥40	≥4
hs-cTn I (Pathfast; LSI Medience)	<3	<4	<3	≥90	≥20
hs-cTn I (TriageTrue; Quidel)	<4	<5	<3	≥60	≥8
0 h/2 h algorithm	**Very low**	**Low**	**No 2hΔ**	**High**	**2hΔ**
hs-cTn T (Elecsys; Roche)	<5	<14	<4	≥52	≥10
hs-cTn I (Architect; Abbott)	<4	<6	<2	≥64	≥15
hs-cTn I (Centaur; Siemens)	<3	<8	<7	≥120	≥20
hs-cTn I (Access; Beckman Coulter)	<4	<5	<5	≥50	≥20
hs-cTn I (Clarity; Singulex)	<1	TBD	TBD	≥30	TBD
hs-cTn I (Vitros; Clinical Diagnostics)	<1	TBD	TBD	≥40	TBD
hs-cTn I (Pathfast; LSI Medience)	<3	TBD	TBD	≥90	TBD
hs-cTn I (TriageTrue; Quidel)	<4	TBD	TBD	≥60	TBD

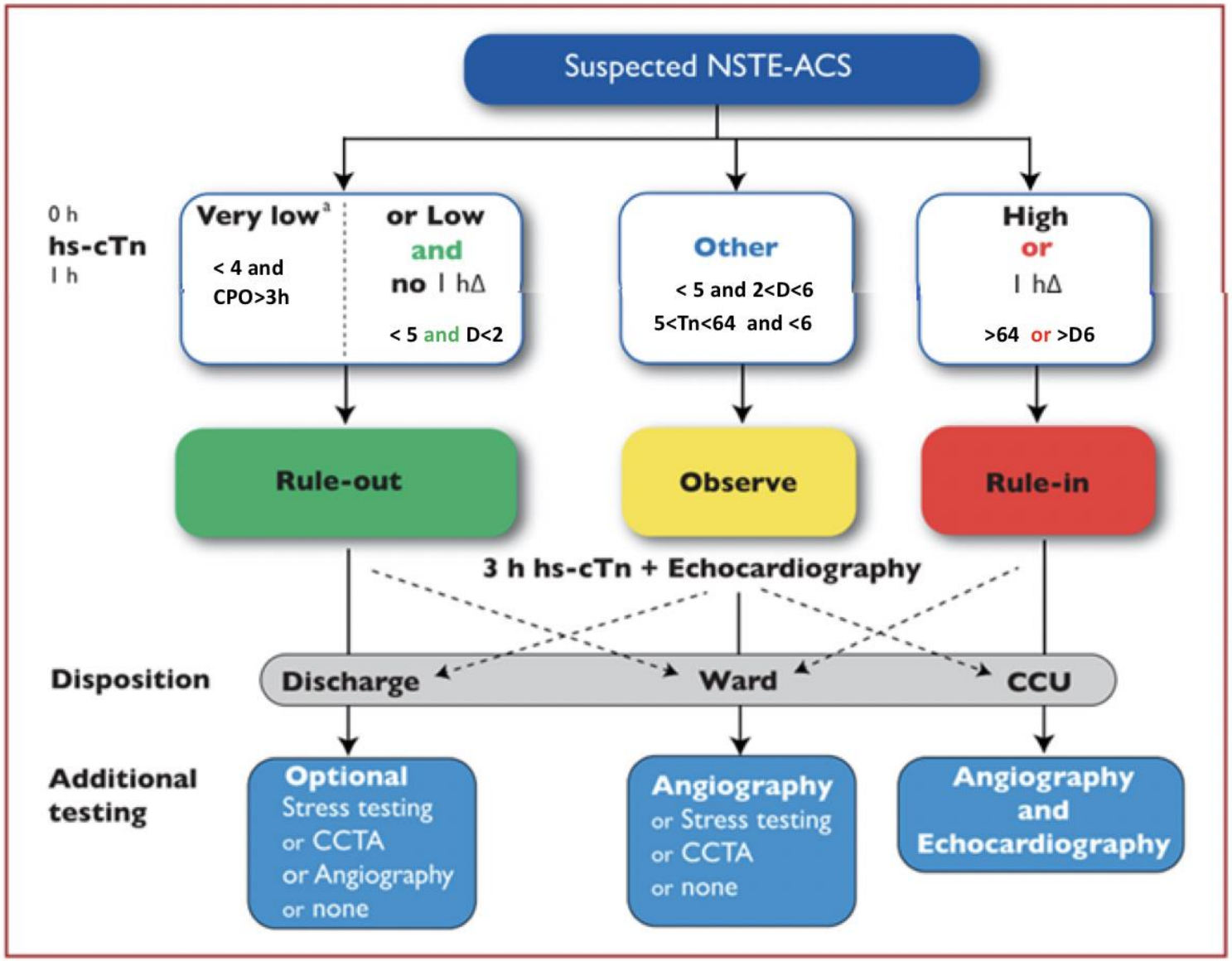
These cut-offs apply irrespective of age and renal function. Optimized cut-offs for patients above 75 years of age and patients with renal dysfunction have been evaluated, but not consistently shown to provide better balance between safety and efficacy as compared to these universal cut-offs.[35,36,69] The algorithms for additional assays are in development.

hs-cTn = high-sensitivity cardiac troponin; TBD = to be determined.[35–37,39,40,68,69,75–84]

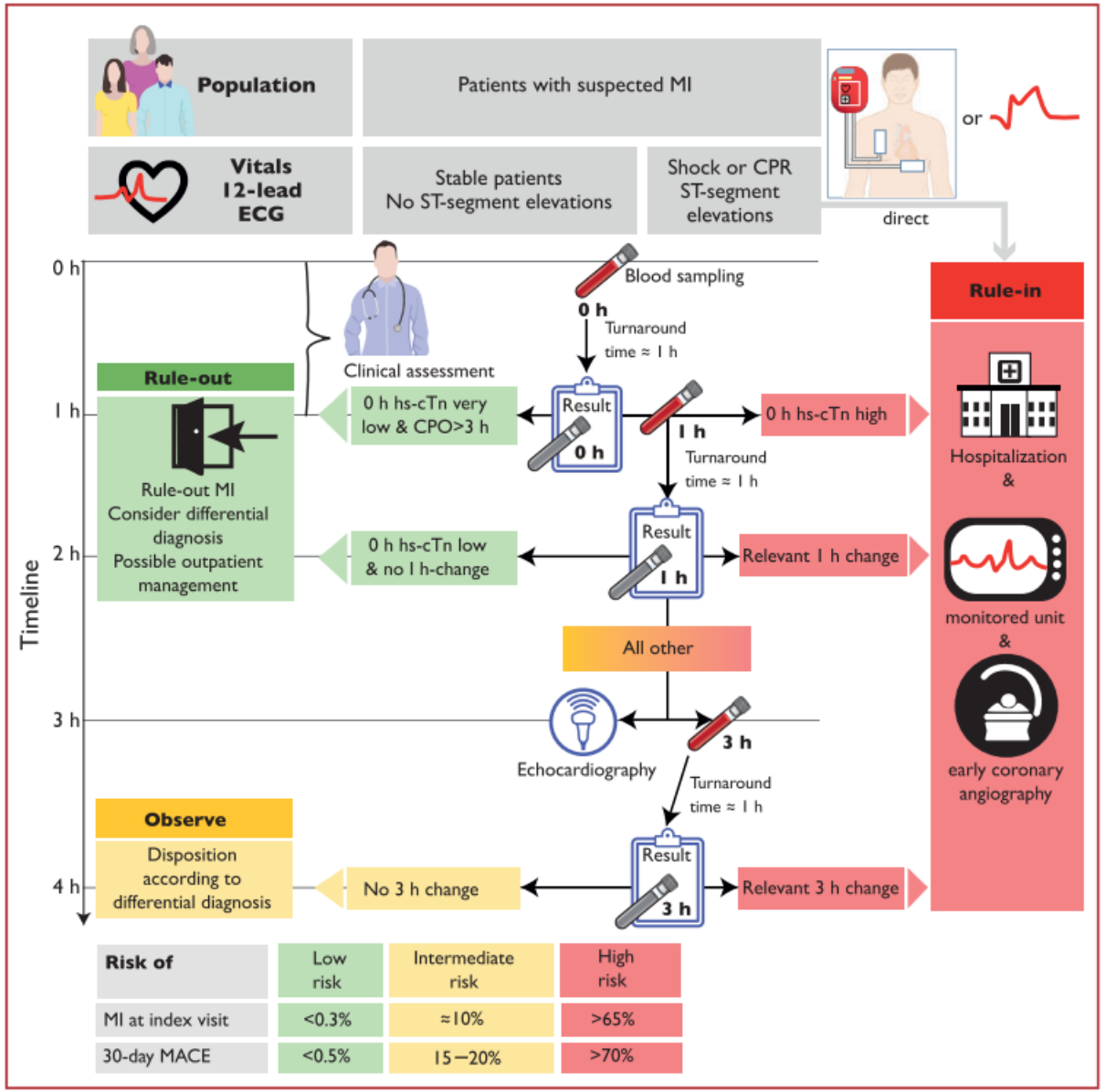
ESC European Society of Cardiology
European Heart Journal (2021) 42, 1289–1367
doi:10.1093/eurheartj/ehaa575
ESC GUIDELINES

2020 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation

ESC Guidelines : 0/1h algorithme



ESC Guidelines : 0/1h algorithme



QUID des (Extremely) early presenters ?

JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY VOL. 72, NO. 6, 2018
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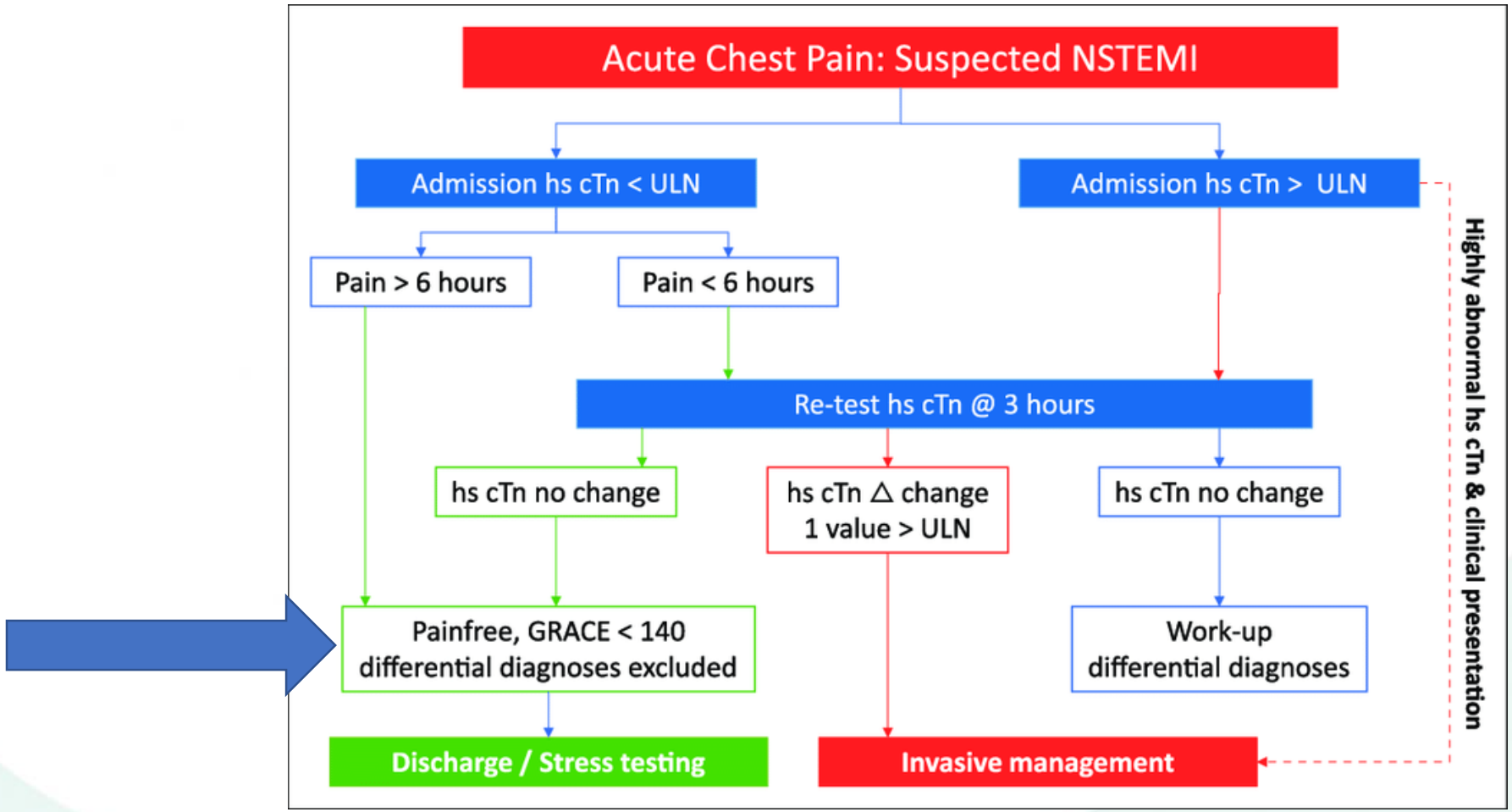
Prospective Validation of the 0/1-h Algorithm for Early Diagnosis of Myocardial Infarction

Raphael Twerenbold, MD,[a,b,*] Johannes Tobias Neumann, MD,[b,c,*] Nils Arne Sörensen, MD,[b,c] Francisco Ojeda, PhD,[b] Mahir Karakas, MD,[b,c] Jasper Boeddinghaus, MD,[a] Thomas Nestelberger, MD,[a] Patrick Badertscher, MD,[a] Maria Rubini Giménez, MD,[a] Christian Puelacher, MD,[a] Karin Wildi, MD,[a] Nikola Kozhuharov, MD,[a] Dominik Breitenbuecher, MD,[a] Ewelina Biskup, MD,[a] Jeanne du Fay de Lavallaz, MD,[a] Dayana Flores, MD,[a] Desiree Wussler, MD,[a] Òscar Miró, MD,[d] F. Javier Martín Sánchez, MD,[e] Beata Morawiec, MD,[f] Jiri Parenica, MD,[g,h] Nicolas Geigy, MD,[i] Dagmar I. Keller, MD,[i] Tanja Zeller, PhD,[b,c] Tobias Reichlin, MD,[a] Stefan Blankenberg, MD,[b,c] Dirk Westermann, MD,[b,c,†] Christian Mueller, MD[a,†]

- 0/1h et 0/2h s'appliquent à tous les patients même à ceux qui présentent une douleur thoracique <2h **MAIS** attention aux patients < 1 heure, **un dosage de troponine à 3h doit être considéré.**

ESC Guidelines 0-3h



RESUME

JACC SCIENTIFIC EXPERT PANEL

Recommendations for Institutions Transitioning to High-Sensitivity Troponin Testing

JACC Scientific Expert Panel

James L. Januzzi, Jr, MD,[a] Simon A. Mahler, MD, MS,[b] Robert H. Christenson, PhD,[c] Jennifer Rymer, MD, MBA,[d] L. Kristin Newby, MD, MHS,[e] Richard Body, MBChB, PhD,[f] David A. Morrow, MD, MPH,[g] Allan S. Jaffe, MD[h]

TABLE 2 Summary of hs-cTn Rapid Rule-Out and Rule-In Accelerated Diagnostic Panels

	0/3h	High STEACS	0/2h	0/1h
Rule-out criteria				
hs-cTnT	<14 ng/l at 0 and 3 h* and GRACE score <140	NA	<14 ng/l at 0 and 2 h and Δ <4 ng/l	<12 ng/l at 0 and 1 h Δ <3 ng/l
hs-cTnI†	<26 ng/l at 0 and 3 h* and GRACE score <140	<5 ng/l at 0 h or a 3-h value: <16 ng/l in women <34 ng/l in men and Δ <3 ng/l	<6 ng/l at 0 and 2 h and Δ <2 ng/l	<5 ng/l at 0 and 1 h Δ <2 ng/l
NPV for MI	98.3%-100%	99.5%	99.4%- 99.9%	98.9%-100%
Sensitivity for MI	98.9%-100%	97.7%	96.0%-99.6%	96.7%-100%
Proportion ruled out	39.8%-49.1%	74.2%	56.0%-77.8%	47.9%-64.2%
Rule-in criteria				
hs-cTnT	>14 ng/l at 0 or 3 h	N.A.	≥53 ng/l at 0 h or ≥10 ng/l Δ at 2 h	≥52 ng/l at 0 h or 1 h Δ ≥ 5 ng/l
hs-cTnI	>26 ng/l at 0 or 3 h	>16 ng/l in women >34 ng/l in men at 0 or 3 h	≥64 ng/l at 0 h or ≥15 ng/l Δ at 2 h	≥52 ng/l at 0 h or 1 h Δ ≥ 6 ng/l
PPV for MI	72.0%-83.5%	59.5%	75.8%-85.0%	63.4%-84.0%
Specificity for MI	96.7%-98.2%	87.6%	95.2%-99.0%	93.8%-97%
Proportion ruled-in	9.7%%-38.2%	22.0%	7.7%-16.7%	13.1%-23.0%

*In patients with ≥6 h of pain, only a single value below this threshold is required. †Abbott ARCHITECT hs-cTnI.

0/1h = accelerated diagnostic protocol to rule out MI in patients presenting >3 h from symptoms using a single hs-cTn measurement at presentation, whereas for other patients, an absolute hs-cTn at presentation and 1-h delta are used to rule out or rule in MI or to place patients in an observational zone; 0/2h = accelerated diagnostic protocol that uses maximal levels and absolute delta hs-cTnI or T concentrations at 0 and 2 h to rule out or rule in MI or place patients in an observational zone; 0/3h = accelerated diagnostic protocol that incorporates hs-cTn at 0 and 3 h, hs-cTn change, and time since pain onset to determine which patients are appropriate for discharge or stress testing versus invasive management; GRACE = Global Registry of Acute Coronary Events; High STEACS = High-Sensitivity Troponin in the Evaluation of Patients With Acute Coronary Syndrome; hs-cTnI = high-sensitivity cardiac troponin I; hs-cTnT = high-sensitivity cardiac troponin T; MI = myocardial infarction; NA = not applicable; NPV = negative predictive value; PPV = positive predictive value.

CHU de Liège

- 5 Alinity CI-séries, Abbott
- Dosage Alinity i STAT High sensitive Troponin i (CMIA)
- **Différentes causes de variabilité :**
- Performance propre à l'automate (Répéta, Repro…)
- Réactif (Lot, expiration, durée à bord)
- Calibrations différentes
- Matrice
- …

Variabilité totale observée

- Variabilité totale observée
  - Variabilité biologique
    - Composante intra-individuelle
    - Composante interindividuelle
  - Variabilité analytique
    - Composante intra-série
    - Composante inter-série

RESULTAT BIOLOGIQUEMENT SIGNIFICATIF

$$RCV = \sqrt{2} \times z \times \sqrt{(CV_A{}^2 + CV_I{}^2)}$$

Analytical point of view

Clinical Chemistry 66:3
495–496 (2020)

Interanalyzer Analytical Variation of a High-Sensitivity Cardiac Troponin T Assay Can Exceed the Cutoff of the European Society of Cardiology 1-Hour Algorithm for Ruling Out Non–ST-Segment Elevated Myocardial Infarction

To the Editor:

St.George Hospital, London :

- « A large clinical biochemistry diagnostic laboratory usually has multiple analyzers performing a hscTnT assay to meet service demand. Zero- and 1-h samples for hs-cTnT from the same patient are likely **to be processed on different analyzers »**.
- **The aim** of this study was to determine whether the interanalyzer analytical variation of the Roche hs-cTnT assay over an 8-h period is satisfactory for the adoption of the ESC 0- to 1-h algorithm.
- Intra- and interanalyzer precision was assessed on the Roche Cobas (**3 Cobas e602 and 2 Cobas e801**) modules and and the emergency department stat laboratory (**1 Cobas e411**) via a serum pool with a hs-cTnT concentration of approximately 6 ng/L at St George's Hospital.
- **Intra- and interanalyzer repeatability** (short-term precision) was assessed by analysis of the serum pool **25 times on each analytical cell** on each Cobas module within 1 h
- The **Cobas e411** module demonstrated the poorest intra-analyzer repeatability, with a CV of **9.6%** and a range of **3 ng/L** (n = 25)
- The **Cobas e602 and e801** modules demonstrated improved intraanalyzer repeatability, with CVs **< 5,7%** and ranges **< 2ng/L** (n=125)

Clinical Chemistry 66:3
495–496 (2020)

Interanalyzer Analytical Variation of a High-Sensitivity Cardiac Troponin T Assay Can Exceed the Cutoff of the European Society of Cardiology 1-Hour Algorithm for Ruling Out Non–ST-Segment Elevated Myocardial Infarction

To the Editor:

- The interanalyzer analytical variation between separate **Cobas e601 and e802** modules is **satisfactory** for the implementation of the ESC 0- to 1-h NSTEMI ruleout algorithm.
- The independent **Cobas e411** module **should not be used** to provide the baseline or repeat hs-cTnT measurement for use in this algorithm `

Table 1. Interanalyzer analytical variation of the Roche high-sensitivity cardiac troponin assay over an 8-h period.

Hours (Cobas module)	Mean, ng/L	Range, ng/L	CV, %	SD	95% CI of SD
0 (e411) (n = 10)	5.46	4–6	11.5	0.63	0.43–1.14
2 (e601/e802) (n = 5)	6.34	6–7	5.4	0.34	0.21–0.99
4 (e601/e802) (n = 5)	6.42	6–7	6.6	0.42	0.25–1.22
6 (e601/e802) (n = 5)	6.03	6–6	4.6	0.28	0.17–0.80
8 (e601/e802) (n = 5)	6.43	6–7	3.4	0.22	0.13–0.62
Mean (n = 30)	6.02	4–7	10.0	0.60	0.48–0.81
Mean excluding 0-h baseline (n = 20)	6.30	6–7	5.4	0.34	0.26–0.50

How Does the Analytical Quality of the High-Sensitivity Cardiac Troponin T Assay Affect the ESC Rule Out Algorithm for NSTEMI?

To the Editor:

Haukeland University Hospital :

$$CV_A = \sqrt{\frac{RCV^2}{2z^2} - CV_I^2}$$

- 10 pool (5 et 12ng/L) dosés 10 x / h et sur 3 jours.
- Cobas E801 (routine/backup)

[Hs-TnT]	RCV théorique (%)	Cv_a théorique (%)	Cv_a intra-analyseur (%)	Cv_a inter-analyseur (%)
5	40	17,1	**5,2**	**9,6 (6,3-12,8)**
12	17	7,1	**1,5**	**4,6 (3,4-5,5)**

How Does the Analytical Quality of the High-Sensitivity Cardiac Troponin T Assay Affect the ESC Rule Out Algorithm for NSTEMI?

To the Editor:

- Dosage 1 x chaque aliquot de chaque pool à chaque changement de lot et comparer à la moyenne totale.
- Novembre 2013 à Mars 2018.

The difference between results from the same pool ranged from approximately **3.5 ng/L at 6 ng/L falling to 3 ng/L at higher concentrations**

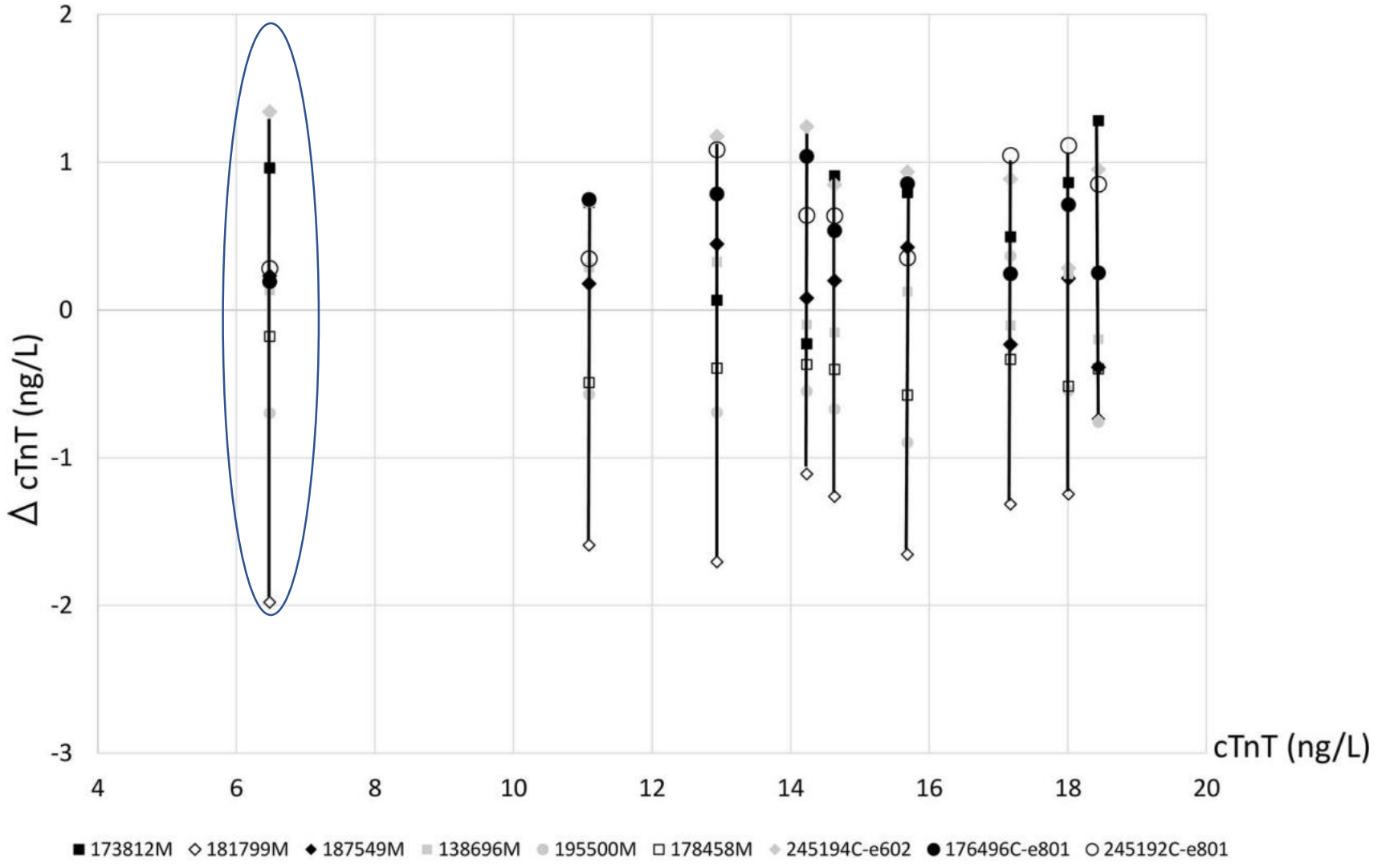


Fig. 1. Difference between lots when measured in fresh frozen serum.

All lots are measured in 9 serum pools with increasing concentrations from 5–19 ng/L: x-axis, mean of all results; y-axis, difference between a lot and the mean value. The Modular E170 are denoted M and the Cobas instruments are denoted C-e602 and C-e801, respectively.

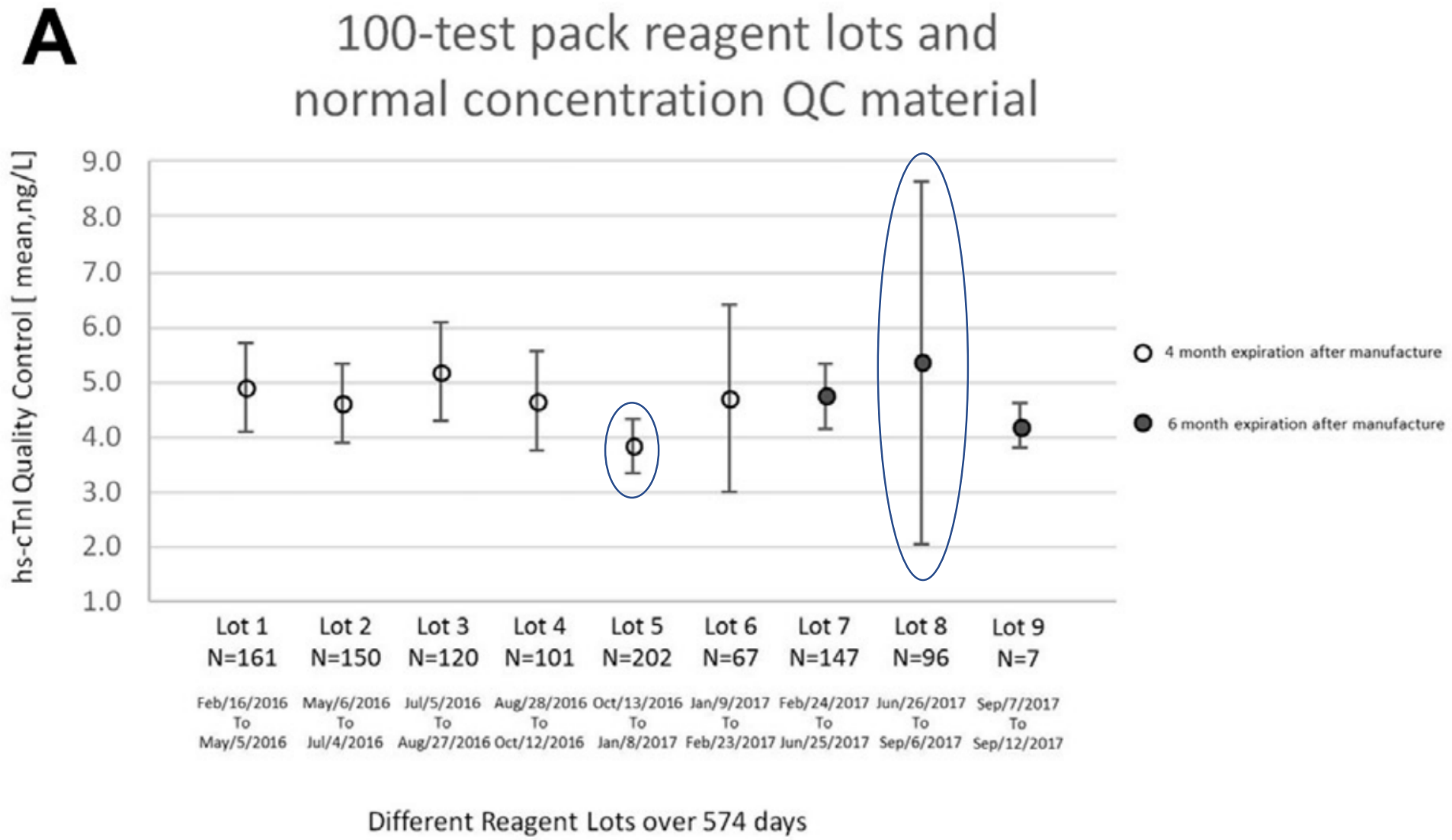
Canadian Journal of Cardiology 34 (2018) 209.e5–209.e6 www.onlinecjc.ca

Letters to the Editor

Variability Between Reagent Lots for High-Sensitivity Cardiac Troponin I May Affect Performance of Early Rule Out Strategies

To the Editor:

- Obtained daily QC data from February 16, 2016 to September 12, 2017 from 9 different lots of 100-test reagent packs at **McMaster University Medical Centre**



LOT 5	LOT 8
QC mean : 3.8 ng/L.	QC mean : 5.4 ng/L
SD: 0.5 ng/L	SD : 3.3 ng/L

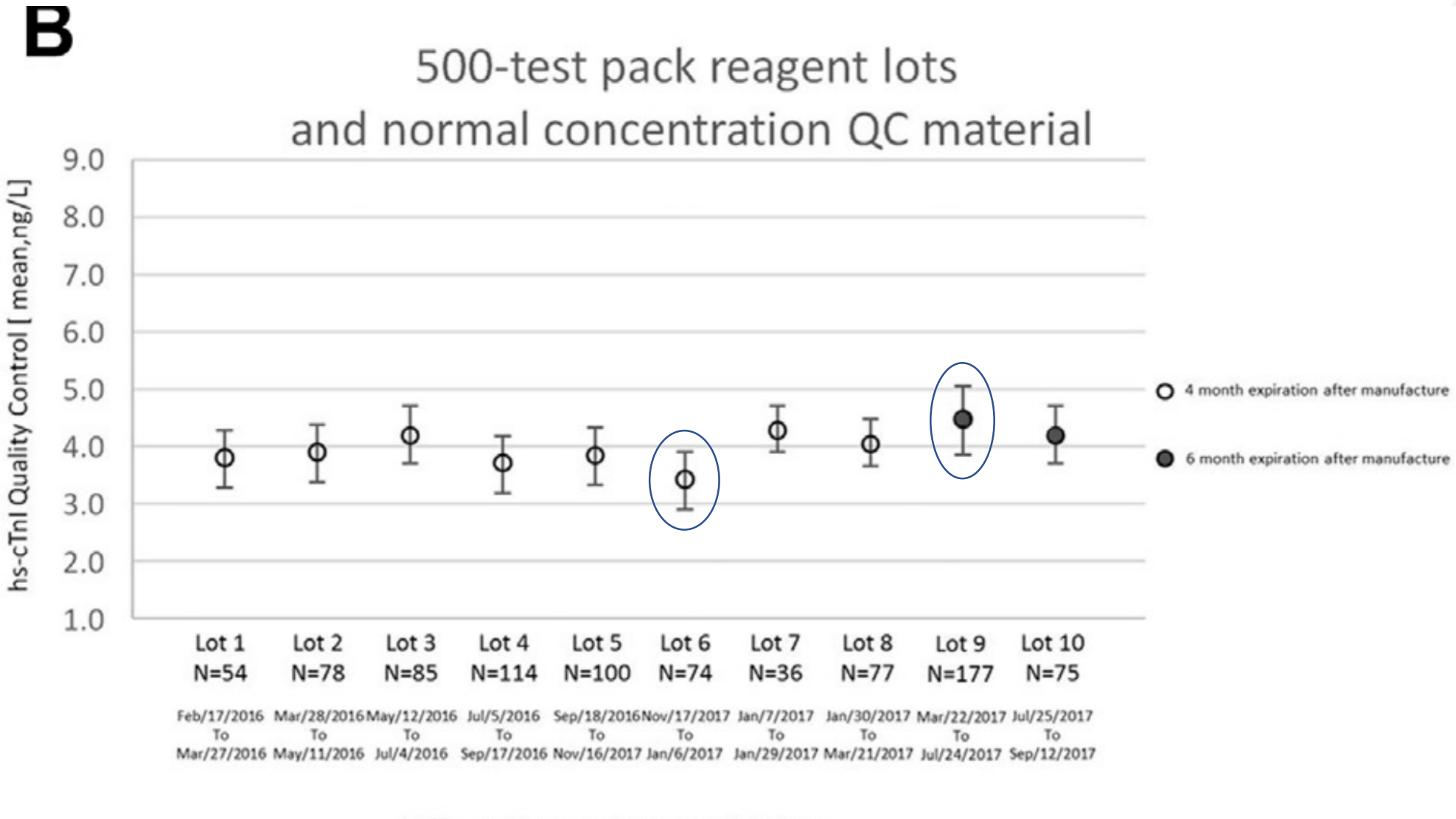
10 different lots of 500-test reagent packs at the **Juravinski Hospital**

Canadian Journal of Cardiology 34 (2018) 209.e5–209.e6 www.onlinecjc.ca

Letters to the Editor

Variability Between Reagent Lots for High-Sensitivity Cardiac Troponin I May Affect Performance of Early Rule Out Strategies

To the Editor:



LOT 6	LOT 9
QC mean : 3.4 ng/L.	QC mean : 4,5 ng/L
SD: 0.5 ng/L	SD : 0,6 ng/L

Letter

The Association for Clinical Biochemistry & Laboratory Medicine
Better Science, Better Testing, Better Care

$$RCV = \sqrt{2} \times z \times \sqrt{(CV_A^2 + CV_I^2)}$$

RCV = Δ2 , Z = 1,96 et CVI = 1.2

Using the European Society of Cardiology 1-h algorithm for ruling out non-ST-segment elevated myocardial infarction to define acceptable analytical performance limits for a cardiac troponin T assay

Table 1. QC limits as defined using the ESC 1-hour algorithm for ruling out non-ST-segment elevated myocardial infarction.

Baseline cTnT (ng/L)	RCV to detect Δ = 2 ng/L (%)	CV_A (%)	SD_A (ng/L)	IQC low (ng/L)	IQC high (ng/L)
12	17	5.9	0.71	10.59	13.41
11	18	6.4	0.71	9.58	12.42
10	20	7.1	0.71	8.58	11.42
9	22	7.9	0.71	7.57	10.43
8	25	8.9	0.72	6.57	9.43
7	29	10.2	0.72	5.57	8.43
6	33	12.0	0.72	4.56	7.44
5	40	14.4	0.72	3.56	6.44

Mini-Review

Revisiting the Biological Variability of Cardiac Troponin: Implications for Clinical Practice

*Nick SR Lan,[1,2] Damon A Bell[2,3,4,5]
[1]Department of Cardiology, Fiona Stanley Hospital, Perth, WA; [2]Medical School, The University of Western Australia, Perth, WA; [3]Department of Cardiology, Lipid Disorders Clinic, Royal Perth Hospital, Perth, WA; [4]Department of Clinical Biochemistry, PathWest Laboratory Medicine, Royal Perth and Fiona Stanley Hospitals, Perth, WA; [5]Department of Clinical Biochemistry, Clinipath Pathology, Perth, WA, Australia.
*For correspondence: Dr Nick Lan, nick.lan@health.wa.gov.au

Author	Assay	Time frame	n	CV_A	CV_I	RCV	Log-normal RCV	CV_G	II
hs-cTnI									
Wu et al.[11]	Singulex	4 hours	12	8.3	9.7	-	+46/-32	57	0.21
		8 weeks	17	15	14	-	+81/-45	63	0.39
Apple et al.[67]	Abbott Architect	Short*	*	13.8	15.2	50.1	+69.3/-40.9	70.5	0.22
		-	-	-	-	-	-	-	-
	Beckman Coulter	Short*	*	14.5	6.1	44.5	+63.8/-38.9	34.8	0.46
		-	-	-	-	-	-	-	-
	Siemens Dimension	Short*	*	13.0	12.9	47	+57.5/-36.5	12.3	0.11
		-	-	-	-	-	-	-	-
Goldberg et al.[68]	Abbott Architect	Short*	*	16.9	37.1	113	-	179.2	0.23
		Long*	*	16.9	117	328	-	179.2	0.66
Vasile et al.[69]	Beckman Coulter	4 hours	20	3.5	3.4	-	+45.2/-15.8	45.3	0.1
		8 weeks	20	2.7	2.6	-	+14/-10.6	41.6	0.1
Wu et al.[70]	Singulex	9 months	17	15	28	-	+98/-49	71	0.45
Aakre et al.[71]	Abbott Architect	6 hours	17	17.3	5.0	-	+64/-39	37.7	0.48
		10 weeks	15	13.8	15.6	-	+77/-44	25.9	0.80
Schindler et al.[72]	Abbott Architect	3 weeks	20	4.8	14.5	37	+53/-34	44.0	0.3
		3 months	20	4.8	14.7	36	+53/-35	56.7	0.3
van der Linden et al.[73]	Abbott Architect	24 hours	18	10.0	8.6	36.7	+44.0/-30.6	49.4	0.27
Koerbin et al.[32]†	Abbott Architect	4 years	453	*	33	-	+147/-59	106	0.36

Cv_a maximal

$$RCV = z\ value\ x\ \sqrt{2}\ x\ (\sqrt{CV_A^2 + CV_I^2})$$

$\Leftrightarrow$

$$CV_A = \sqrt{\frac{RCV^2}{2z^2} - CV_I^2}$$

Ex RULE OUT : Shift 5 =>7 => 40% of différence $\Leftrightarrow$ RCV = 40%

Cv_a maximal

$$CV_A = \sqrt{\frac{RCV^2}{2z^2} - CV_I^2}$$

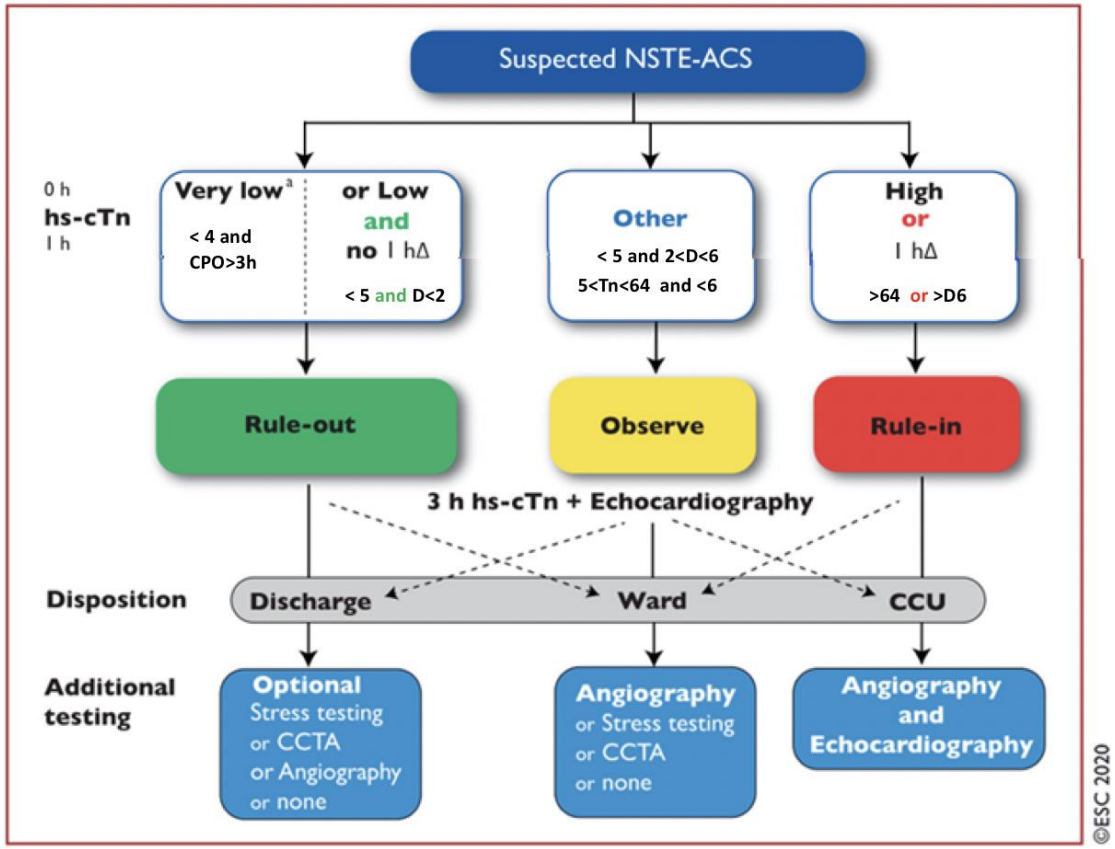
- Cvi : 3,4%
- Z value = 1,96 (99% CI)

Ex :

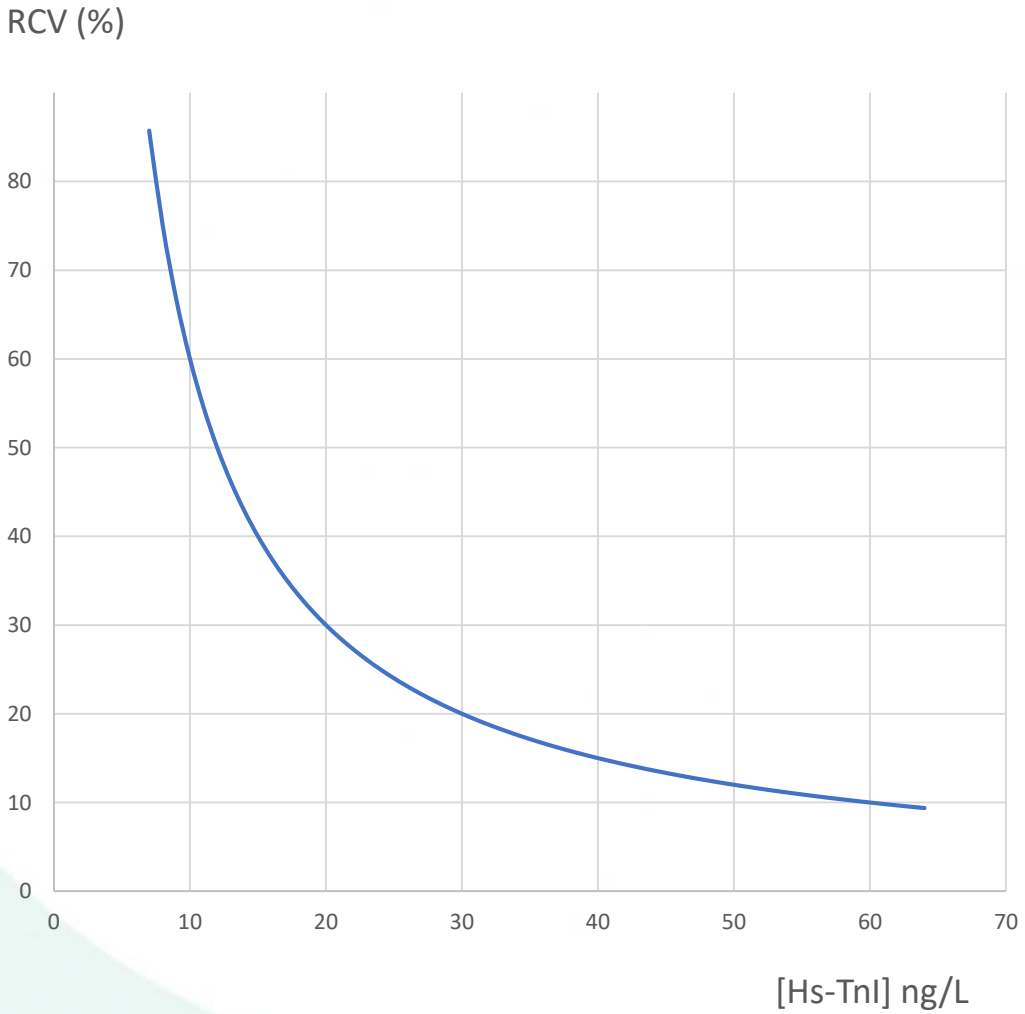
1) 5 => 7 : $\sqrt{(\frac{40^2}{2\ x\ 1{,}962}) - 3{,}4^2}$ = **14%**

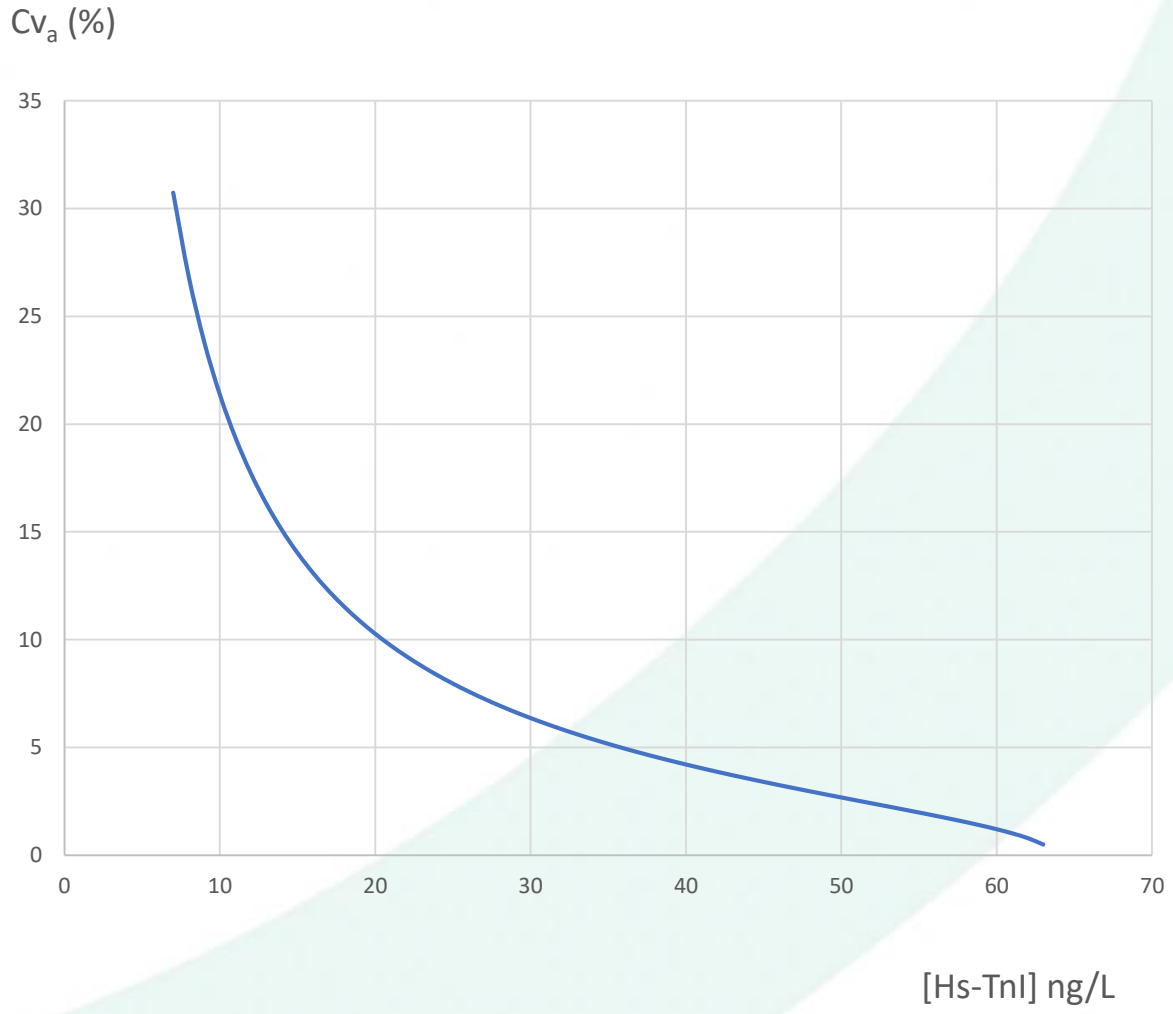
2) 6 =>12. : $\sqrt{(\frac{100^2}{2\ x\ 1{,}962}) - 3{,}4^2}$ = **35%**

3) 63 => 69 : $\sqrt{(\frac{9{,}5^2}{2\ x\ 1{,}962}) - 3{,}4^2}$ = **0,4%**



Cv_a maximal

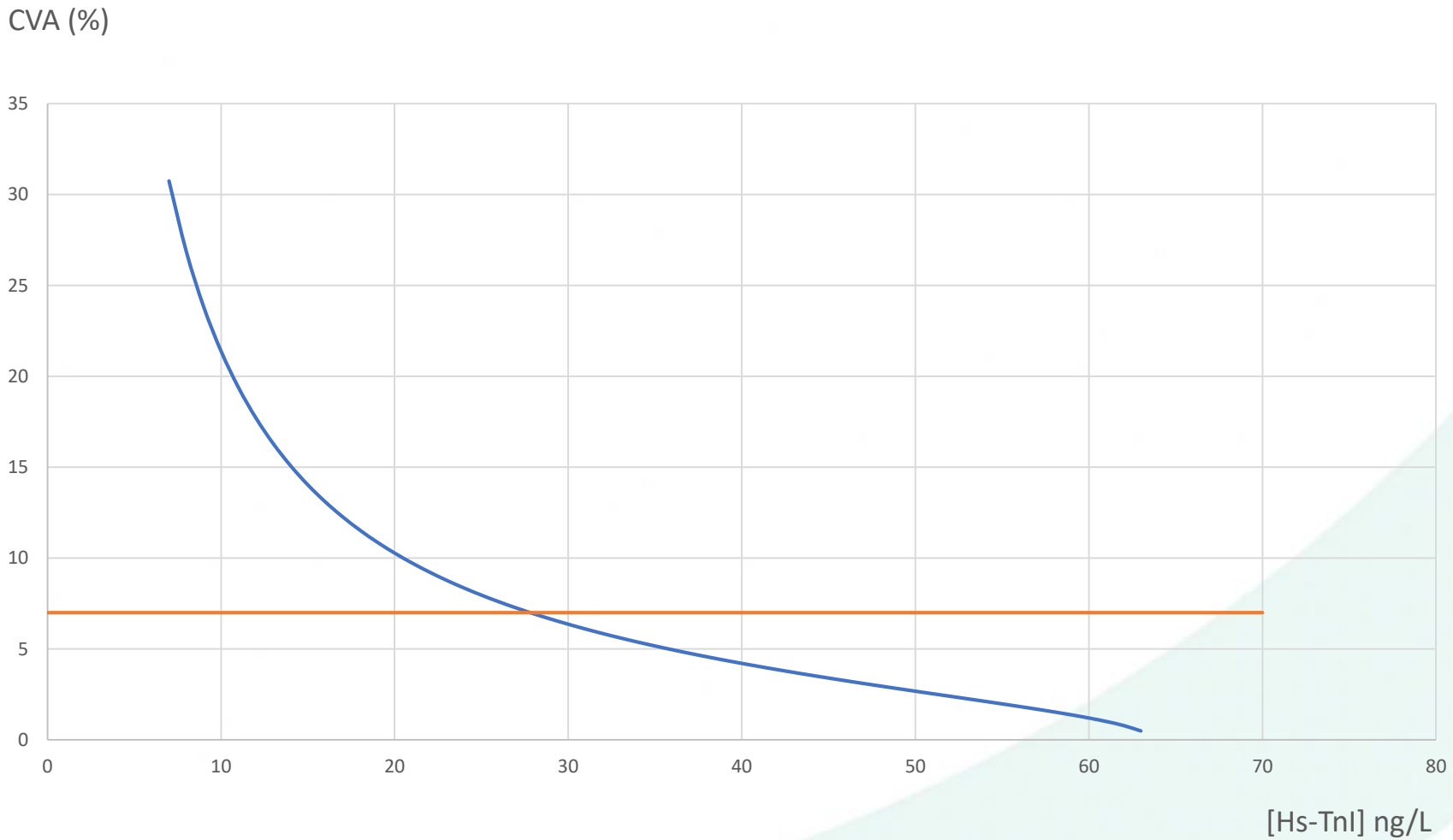

RCV (%)
80
70
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
[Hs-TnI] ng/L


Cv_a (%)
35
30
25
20
15
10
5
0
0
10
20
30
40
50
60
70
[Hs-TnI] ng/L

CV CHU de Liège

		Alinity 1 (Ai02606)	Alinity 2 (Ai01149)	Alinity 3 (Ai02640)	Alinity 4 (Ai03288)	Alinity 5 (Ai01128)
Reproductibilité (CHU)	QC1 (20,97)	7,06	7	7,16	8,17	7,2
	QC3 (1608,42)	7,83	7,39	6,05	7,21	6,05

Evolution du Cv_a en fonction de la concentration en TnI



ΔTNI en fonction de la performance du laboratoire

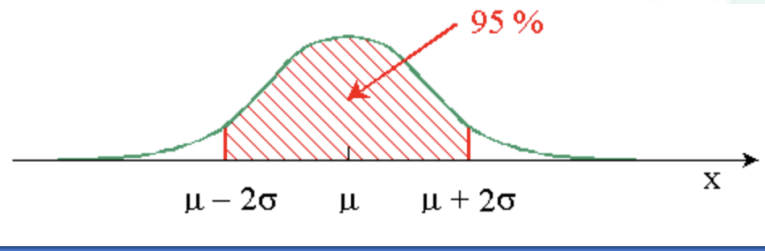
Considérons [Hs-TnI] avec un CV_a ou $Cv_{interanalyseur}$ calculé au laboratoire.

Soit on surestime soit on sous-estime par le $CV_a/CV_{internarlyseur}$

Donc à partir d'une [Hs-TnI] :

$$Cv_{inter} = \frac{\sigma}{\mu} \times 100$$

l'intervalle à 95%



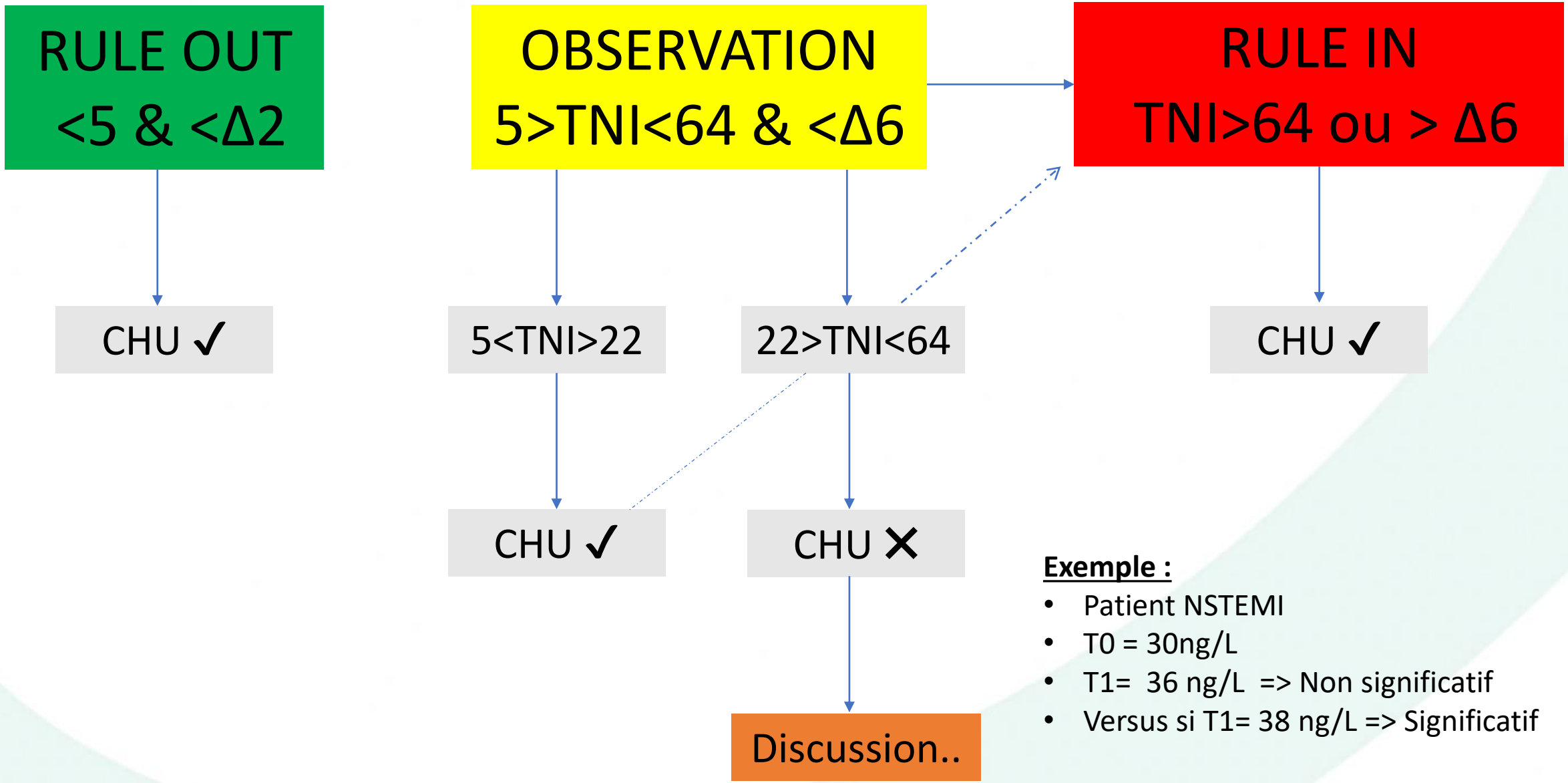
$[Hs\text{-}TnI]_{max}$: $[Hs\text{-}TnI] + 2 \times \frac{[Hs-TnI] \times Cvinter}{100}$ & $[Hs\text{-}TnI]_{min}$: $[Hs\text{-}TnI - 2 \times \frac{[Hs-TnI] \times Cvinter}{100}$

Après soustraction de $[Hs\text{-}TnI]_{max}$ et de $[Hs\text{-}TnI]_{min}$ nous obtenons le $\Delta_{analytique}$ via la formule :

$$\Delta_{analytique} = 4 \times \frac{[Hs-TnI] \times Cvinter}{100}$$

$$\Delta_{analytique} = 4 \times \frac{[Hs\text{–}TnI] \times Cvinter}{100}$$

[TNI] ng/L	$[TNI]_{min}$	$[TNI]_{max}$	Δ[TNI]
3,0	**3,4**	**2,6**	**0,8**
4,0	**4,6**	**3,4**	**1,1**
5,0	**5,7**	**4,3**	**1,4**
6,0	6,8	5,2	1,7
7,0	8,0	6,0	2,0
8,0	9,1	6,9	2,2
9,0	10,3	7,7	2,5
10,0	11,4	8,6	2,8
11,0	12,5	9,5	3,1
12,0	13,7	10,3	3,4
13,0	14,8	11,2	3,6
14,0	16,0	12,0	3,9
15,0	17,1	12,9	4,2
16,0	18,2	13,8	4,5
17,0	19,4	14,6	4,8
18,0	20,5	15,5	5,0
19,0	21,7	16,3	5,3
20,0	22,8	17,2	5,6
21,0	23,9	18,1	5,9
22,0	25,1	18,9	6,2
…	…	…	…
30,0	26,0	34,0	8,0
…	…	…	…
62,0	70,7	53,3	17,4
63,0	71,8	54,2	17,6
64,0	73,0	55,0	17,9



Exemple :

- Patient NSTEMI
- T0 = 30ng/L
- T1= 36 ng/L => Non significatif
- Versus si T1= 38 ng/L => Significatif

LIMITES ET PERPECTIVES

- **Limites :**
- Moyen de détermination du CVa (répétabilité, reproductibilité, valeurs QCI)
- Choix/Détermination CVi pour le calcul (pathologies chroniques..)
- Calcul théorique sur base d'une formule
- **Perspectives:**
- QC a des valeurs basses
- Lots de QC
- Quid du CVa inter-tubes (Hépariné versus Sec)
- Adaptation de l'algorithme en fonction du CVa du laboratoire ?

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