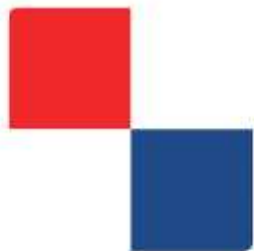


Racionalizacija u okviru pre-predanalitičke faze

racionalizacija (lat.).

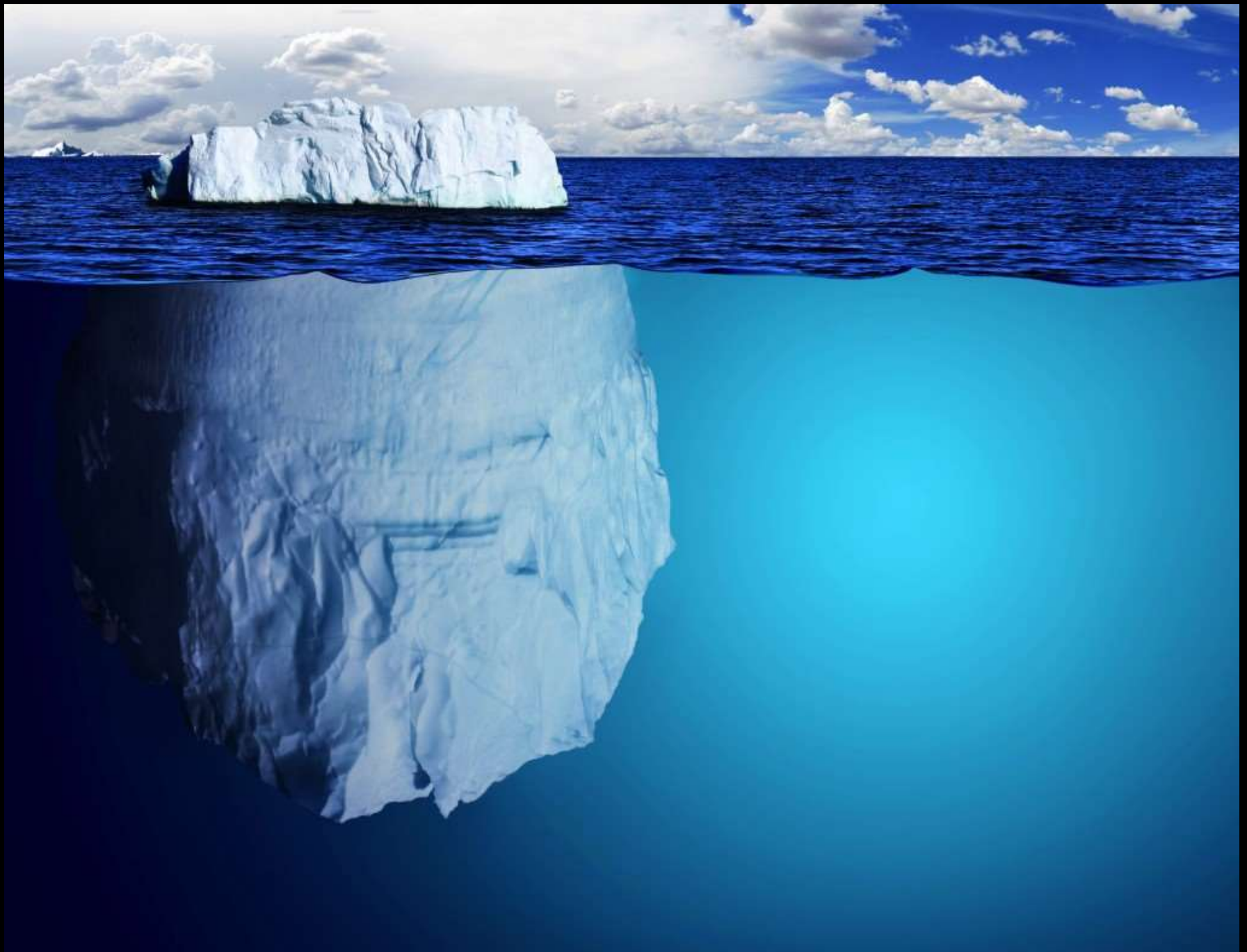
1. Usklađivanje, prilagodba ili objašnjavanje na racionalnim temeljima.
2. Pojednostavnjenje, poboljšanje procesa proizvodnje.



Hrvatski leksikon

Do we know what inappropriate
laboratory utilization is?

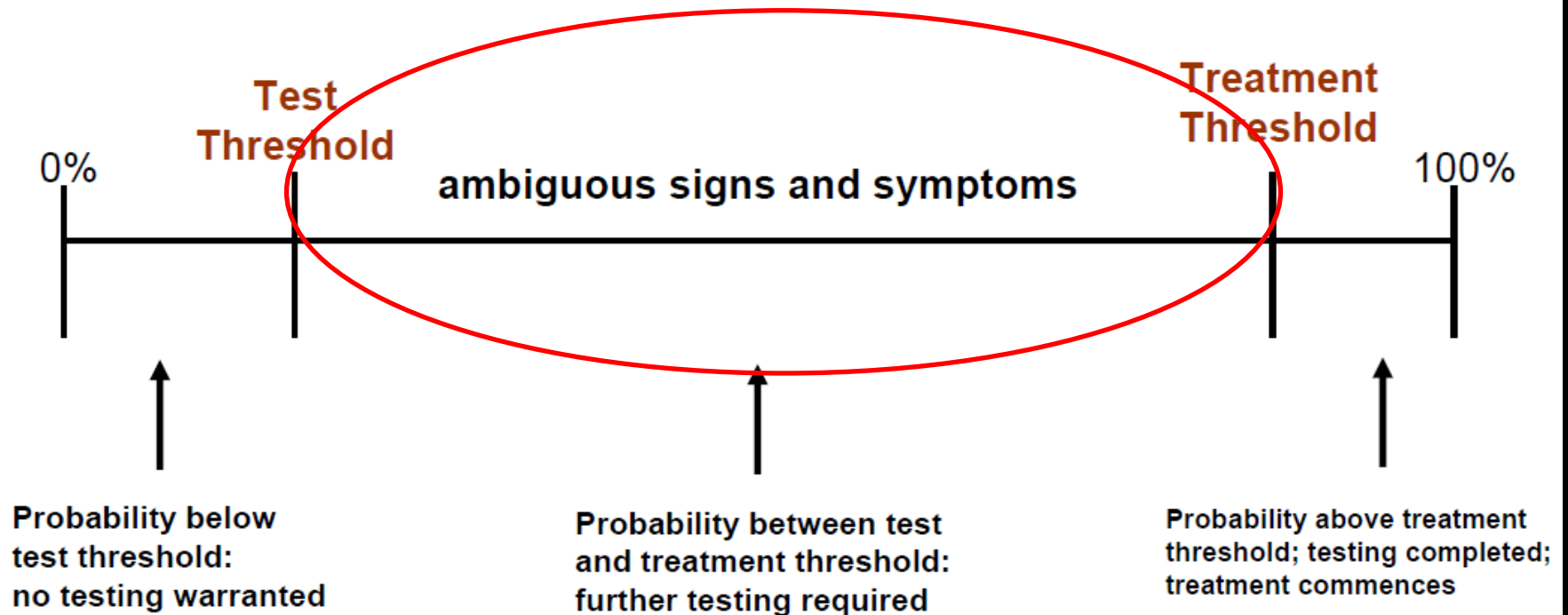
*Van Walraven & Naylor, JAMA
280;551-558, 1998.*



Definicija

- Učestalost traženja pretraga (ponavljanje)
- Izbor pretrage ako postoji bolja alternativa
- Klinička indikacija za pretragu
- Vjerojatnost patološkog rezultata

Probability of Diagnosis



Missed and Delayed Diagnoses in the Ambulatory Setting: A Study of Closed Malpractice Claims

Tejal K. Gandhi, MD, MPH; Allen Kachalia, MD, JD; Eric J. Thomas, MD, MPH; Ann Louise Puopolo, BSN, RN; Catherine Yoon, MS; Troyen A. Brennan, MD, JD; and David M. Studdert, LLB, ScD

Background: Although missed and delayed diagnoses have become an important patient safety concern, they remain largely unstudied, especially in the outpatient setting.

Objective: To develop a framework for investigating missed and delayed diagnoses, advance understanding of their causes, and identify opportunities for prevention.

Design: Retrospective review of 307 closed malpractice claims in which patients alleged a missed or delayed diagnosis in the ambulatory setting.

Setting: 4 malpractice insurance companies.

diagnostic process were failure to order an appropriate diagnostic test (100 of 181 [55%]), failure to create a proper follow-up plan (81 of 181 [45%]), failure to obtain an adequate history or perform an adequate physical examination (76 of 181 [42%]), and incorrect interpretation of diagnostic tests (67 of 181 [37%]). The leading factors that contributed to the errors were failures in judgment (143 of 181 [79%]), vigilance or memory (106 of 181 [59%]), knowledge (86 of 181 [48%]), patient-related factors (84 of 181 [46%]), and handoffs (36 of 181 [20%]). The median number of process breakdowns and contributing factors per error was 3 for both (interquartile range, 2 to 4).

Limitations: Reviewers were not blinded to the litigation outcomes,

U 55% slučajeva radilo se o propustu u smislu nedovoljne dijagnostičke obrade



Annals of Emergency Medicine

Volume 49, Issue 2, February 2007, Pages 196–205



Patient safety/original research

Missed and Delayed Diagnoses in the Emergency Department: A Study of Closed Malpractice Claims From 4 Liability Insurers

Allen Kachalia, MD, JD^a, Tejal K. Gandhi, MD, MPH^a, Ann Louise Puopolo, BSN, RN^a,
Catherine Yoon, MS^c, Eric J. Thomas, MD, MPH^d, Richard Griffey, MD, MPH^b, Troyen A.
Brennan, MD, JD^{a, c}, David M. Studdert, LLB, ScD^c 

.....propust provođenja odgovarajuće dijagnostičke pretrage (58% slučajeva)

Rutinsko zadavanje pretraga





Perverzne financijske inicijative (više pretraga = veća zarada)

Astion ML. 2006. Interventions that improve laboratory utilization: from gentle guidance to strong restrictions. *Laboratory Errors and Patient Safety*. 2(4):8-9

Do We Now Know What Inappropriate Laboratory Utilization Is?

An Expanded Systematic Review of Laboratory Clinical Audits

Ronald G. Hauser, MD¹ and Brian H. Shirts, MD, PhD²

 Author Affiliations

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The Landscape of Inappropriate Laboratory Testing: A 15-Year Meta-Analysis

Ming Zhi¹, Eric L. Ding^{1,2,3}, Jesse Theisen-Toupal^{1,4}, Julia Whelan^{1,5}, Ramy Arnaout^{1,6,7*}

1 Harvard Medical School, Boston, Massachusetts, United States of America, **2** Channing Laboratory, Department of Medicine, Brigham and Women's Hospital, Boston, Massachusetts, United States of America, **3** Department of Nutrition, Harvard School of Public Health, Boston, Massachusetts, United States of America, **4** Division of General Medicine and Primary Care, Department of Medicine, Beth Israel Deaconess Medical Center, Boston, Massachusetts, United States of America, **5** Countway Library of Medicine, Harvard Medical School, Boston, Massachusetts, United States of America, **6** Department of Pathology, Beth Israel Deaconess Medical Center, Boston, Massachusetts, United States of America, **7** Division of Clinical Informatics, Department of Medicine, Beth Israel Deaconess Medical Center, Boston, Massachusetts, United States of America

Abstract

Background: Laboratory testing is the single highest-volume medical activity and drives clinical decision-making across medicine. However, the overall landscape of inappropriate testing, which is thought to be dominated by repeat testing, is unclear. Systematic differences in initial vs. repeat testing, measurement criteria, and other factors would suggest new priorities for improving laboratory testing.

Methods: A multi-database systematic review was performed on published studies from 1997–2012 using strict inclusion and exclusion criteria. Over- vs. underutilization, initial vs. repeat testing, low- vs. high-volume testing, subjective vs. objective appropriateness criteria, and restrictive vs. permissive appropriateness criteria, among other factors, were assessed.

Results: Overall mean rates of over- and underutilization were 20.6% (95% CI 16.2–24.9%) and 44.8% (95% CI 33.8–55.8%). Overutilization during initial testing (43.9%; 95% CI 35.4–52.5%) was six times higher than during repeat testing (7.4%; 95%



Pregled prirode mogućih intervencija

Nježni pristup

Edukacija:

- predavanja
- stručni sastanci
- poslijediplomska nastava
- smjernice (pismeno, web)

Proaktivni pristup

- Izvješća o iskorištenju laboratorija po liječnicima
- promjene na manualno traženje pretraga
- redizajn uputnice
- obavijesti u LIS-u o dvostrukom naručivanju istih pretraga
- kontakt s ključnim kliničarem ili kliničarima

Energično prohibitivni pristup

- zahtjev za višu razinu dobrenja (npr. samo starija služba ili specijalisti određene struke)

Anketa provedena s liječnicima

“Ne zovemo laboratorij, zovemo specijaliste”

“Uopće mi nije palo na pamet da mogu zvati laboratorij da pitam koje pretrage tražiti”

“Nema smisla zvati laboratorij, uglavnom se nitko ne javlja”

“Ne znam koji je pravi broj”

„Kad nazovem radiologa, pričam s kolegom.
Kad zovem laboratorij, pričam s crnom
kutijom”



PRETRAGE/ABECEDNIM REDOM:

A – F

G – M

N – Ž

OSTALO

Informacije o pojedinim laboratorijskim pretragama:

- ▶ izaberite početno slovo laboratorijske pretrage koju trebate
- ▶ u abecednom nizu nađite naziv svoje pretrage; kad kliknete mišem na tu pretražu, pokazat će Vam se broj telefona koji možete nazvati radi informacije o pretrazi

Povjerenstva za dijagnostiku

Examples of Clinical
Laboratory
Utilization Committees



College of American Pathologists, 2013



Racionalna dijagnostika poremećaja štitnjače

Lada Baković, Martina Čoza, Ana Valčić

Odjel za laboratorijsku dijagnostiku Opće bolnice zadar

**SMJERNICE HRVATSKOG DRUŠTVA ZA ŠTITNJAČU
ZA RACIONALNU DIJAGNOSTIKU POREMEĆAJA
FUNKCIJE ŠTITNJAČE**

**CROATIAN THYROID SOCIETY GUIDELINES
FOR RATIONAL DETECTION OF THYROID DYSFUNCTION**

ZVONKO KUSIĆ, TOMISLAV JUKIĆ, MAJA FRANCESCHI, NINA DABELIĆ,
SANJA RONČEVIĆ, LJERKA LUKINAC, ŽELJKA LABAR, NEVEN MATEŠA,
MILJENKO SOLTER, DAMIR DODIG, MIRKO KORŠIĆ, ZDENKA BENCE-ŽIGMAN*

Pripremna faza

Distribucija smjernica putem

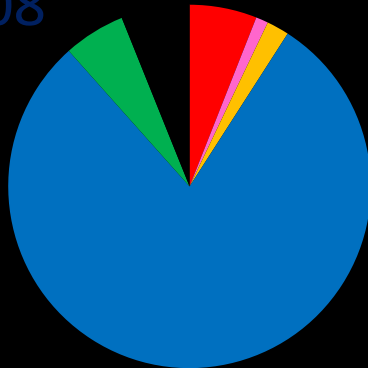
- Predavanja
- Ispisa i raspodjele u papirnatom obliku
- Postavljanja smjernica na web stranicu
- Dnevnim osobnim kontaktom

2008

2013

TSH		6.0%		30.8%
TSH+T4		1.1%		34.6%
TSH+FT4		2.0%		21.3%
TSH+T3+T4		79.3%		3.3%
TSH+T3+T4+Thyroid Ab		5.5%		1.8%
Other		6.1%		8.2%

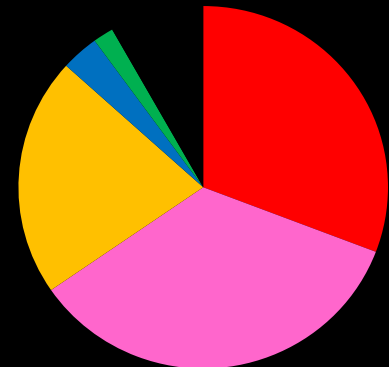
2008



TSH
TSH+T4
TSH+FT4

TSH+T3+T4
TSH+T3+T4+Thyroid Ab

2013



Ušteda?

oko 350 000 kn/godišnje ili oko 7% godišnjeg budžeta

Sredstva upotrijebljena za nove (smislene) pretrage

☒ Zadani lab.šalter ☐ Svi

☐ Hitna radišta

Otorinolaringologija
Ortopedija
Psihijatrija
Ortopedska pomagala i re
Kardiologija
Stomatologija
Torakalna kirurgija
Urologija
Nuklearna
Onkologija

☒ Laboratorij +

☒ Uzorak 03.06.2015 12:55 -

Grupe postupaka
HTR - HMZ - satelitski lab
ZHD - hitni prijem
LKV - likvorski

☒ Mikrobiologija +

☒ Patologija +

☒ Gastroenterologija +

☒ Obdukcija Petrova +

☒ Obdukcija Rebro +

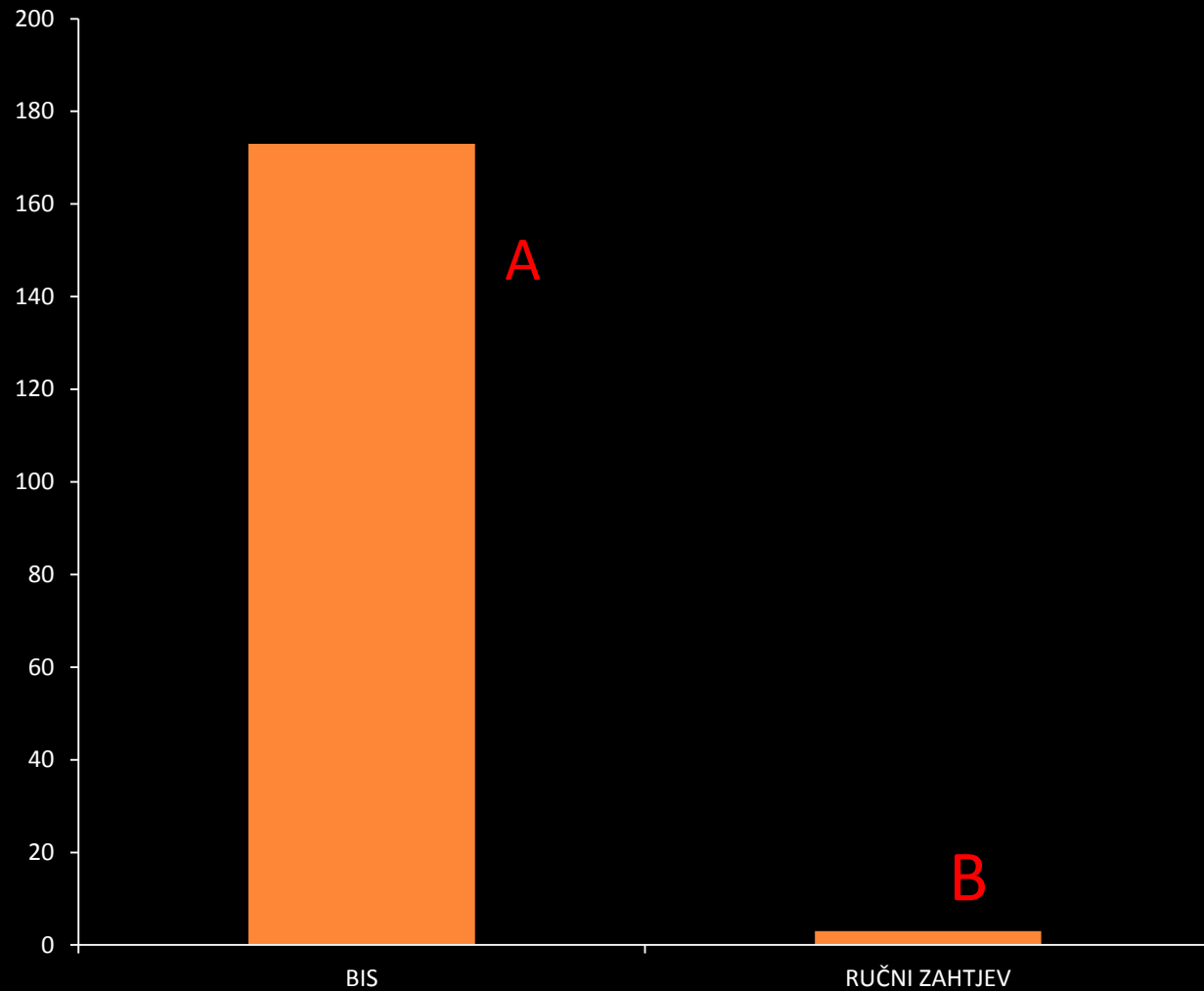
Filtriraj

☐ 1 L0859 - PV-INR	☐ 1 L0124 - Beta-HCG (P)zadati i p...	☐ 1 L0097 - Kloridi (P)
☐ 1 L0146 - Plinske analize; elektro...	☐ 1 L0120 - CO-Hb (P)-zadati i posl...	☐ 1 L0096 - Kalij (P)
☐ 1 L0144 - APT-test-Razlikovanje...	☐ 1 L0119 - Met-Hb (P)-zadati i pos...	☐ 1 L0095 - Natrij (P)
☐ 1 L0143 - Osmolalnost H (S)-zad...	☐ 1 L0118 - Etanol (P)--zadati i posl...	☐ 1 L0094 - Glukoza (P)
☐ 1 L0142 - Okultna krv (F)	☐ 1 L0116 - CRP (P)	☐ 1 L1017 - MOKRAĆA - kvalitativn...
☐ 1 L0141 - Beta-HCG kvalitativni t...	☐ 1 L0114 - Laktat (P)	☐ 1 L1018 - MOKRAĆA - sediment
☐ 1 L0137 - Troponin T (P)	☐ 1 L0113 - Lipaza (P) na poziv lije...	
☐ 1 L0136 - CK MB (P)-zadati i posl...	☐ 1 L0112 - Amilaza (U)	
☐ 1 L0135 - LD (P)	☐ 1 L0111 - Amilaza (P)	
☐ 1 L0134 - CK (P)	☐ 1 L0109 - GGT (P)	
☐ 1 L0133 - D-dimeri (Citrat-krv)	☐ 1 L0108 - ALP (P)	
☐ 1 L0130 - APTV (Citrat-krv)	☐ 1 L0106 - ALT (P)	
☐ 1 L0129 - PV (Citrat-krv)	☐ 1 L0105 - Bilirubin konjugirani (P)	
☐ 1 L0128 - Retikulociti (EDTA-krv)	☐ 1 L0104 - Bilirubin ukupni (P)	
☐ 1 L0127 - Diferencijalna krvna sli...	☐ 1 L0102 - Ureja (P)	
☐ 1 L0126 - KKS (KS + DIF)(EDTA-...	☐ 1 L0101 - Kreatinin (P)	
☐ 1 L0125 - KS (CKS + Lkc + Trc)(...	☐ 1 L0099 - Kalcij (ionizirani) (P,S)	

HITNA SLUŽBA – DNEVNI BROJ FIBRINOGENA

A) NARUČIVANJE U BIS-U

B) RUČNO NARUČIVANJE



☒ Zadani lab.šalter ☐ Svi

☐ Hitna radišta

Otorinolaringologija
Ortopedija
Psihijatrija
Ortopedska pomagala i re
Kardiologija
Stomatologija
Torakalna kirurgija
Urologija
Nuklearna
Onkologija

☒ Laboratorij +

☒ Uzorak 03.06.2015 12:55 -

Grupe postupaka
HTR - HMZ - satelitski lab
ZHD - hitni prijem
LKV - likvorski

☒ Mikrobiologija +

☒ Patologija +

☒ Gastroenterologija +

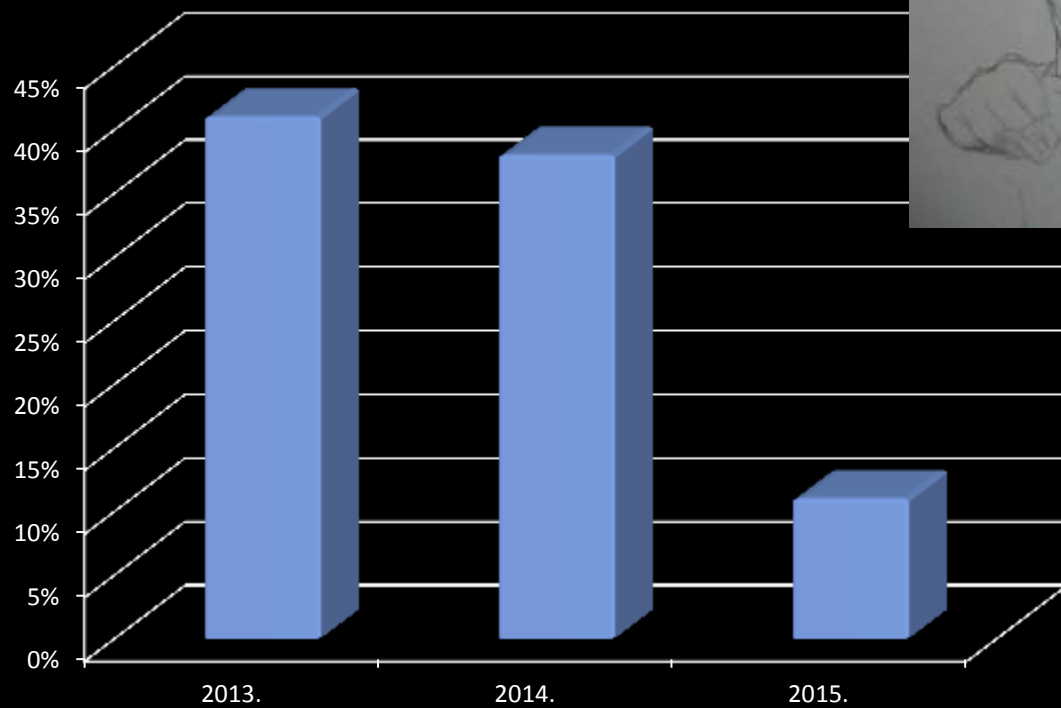
☒ Obdukcija Petrova +

☒ Obdukcija Rebro +

Filtriraj

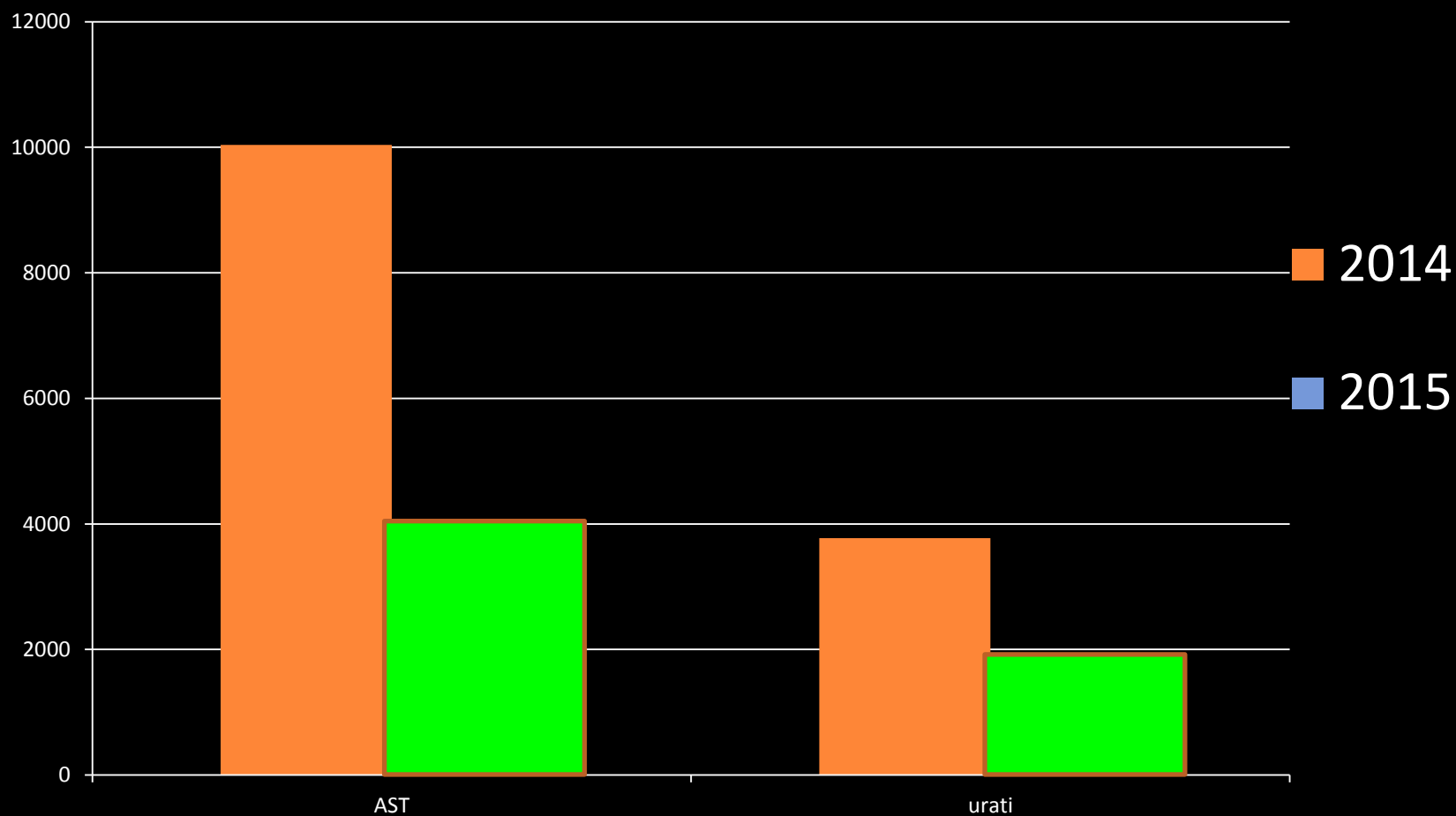
☐ 1 L0859 - PV-INR	☐ 1 L0124 - Beta-HCG (P)zadati i p...	☐ 1 L0097 - Kloridi (P)
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☐ 1 L0126 - KKS (KS + DIF)(EDTA-...	☐ 1 L0101 - Kreatinin (P)	
☐ 1 L0125 - KS (CKS + Lkc + Trc)(...	☐ 1 L0099 - Kalcij (ionizirani) (P,S)	

AST
treba ručno upisati ili nazvati



AST

Urati (broj/mjesec)



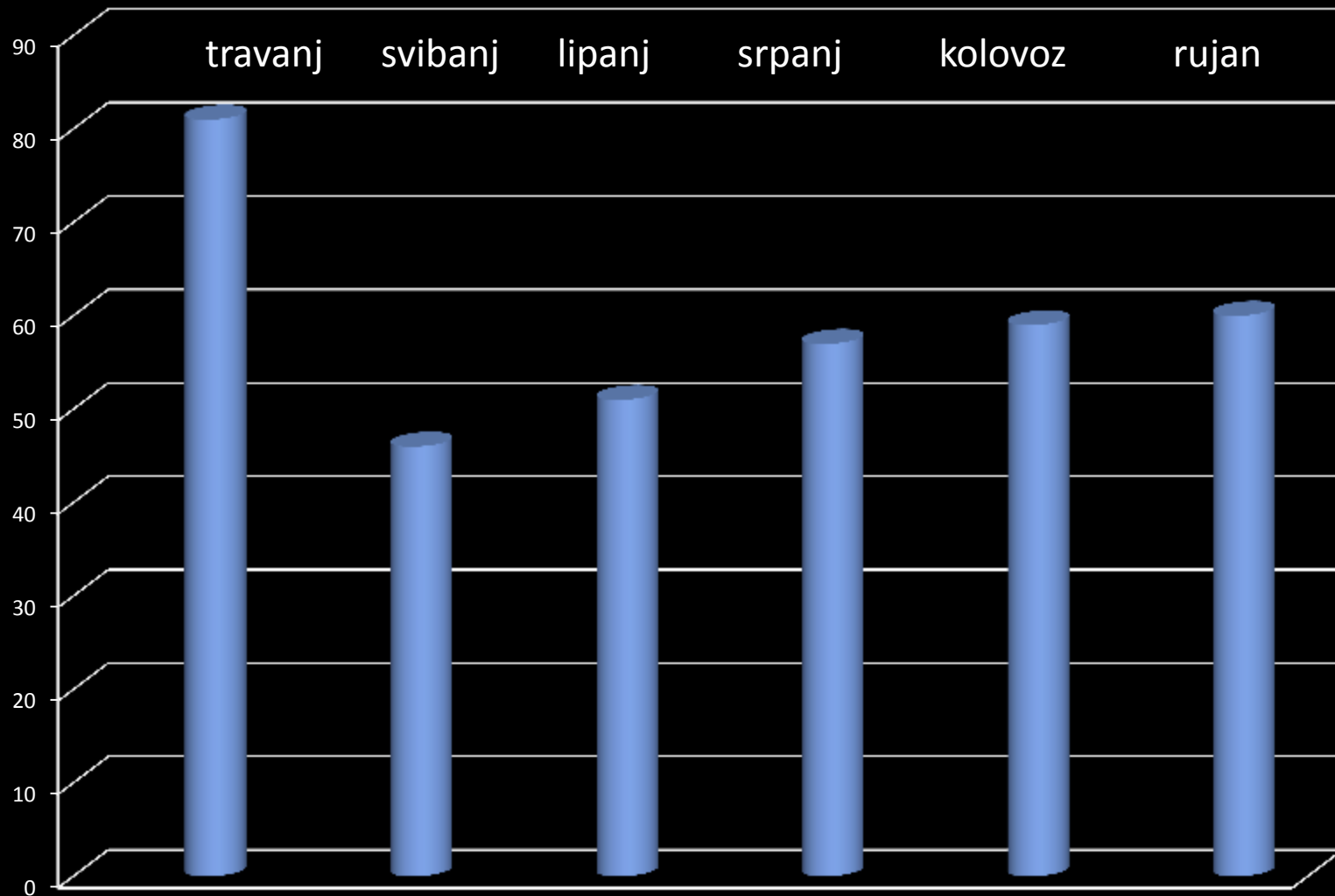


PRETRAGA MJESECA
SVIBNJA

APTV

Razmislite treba li vam zaista u
obradi hitnog pacijenta!

APTV





People need to be reminded more often than they
need to be instructed.

(Samuel Johnson)

Akutni koronarni sindrom

- Ručno „isključivanje” CK ukoliko se traži troponin



Troponin T



45%

Postotak bolesnika s
ponovljenim mjerenjem troponina
nakon 3 sata - 9%



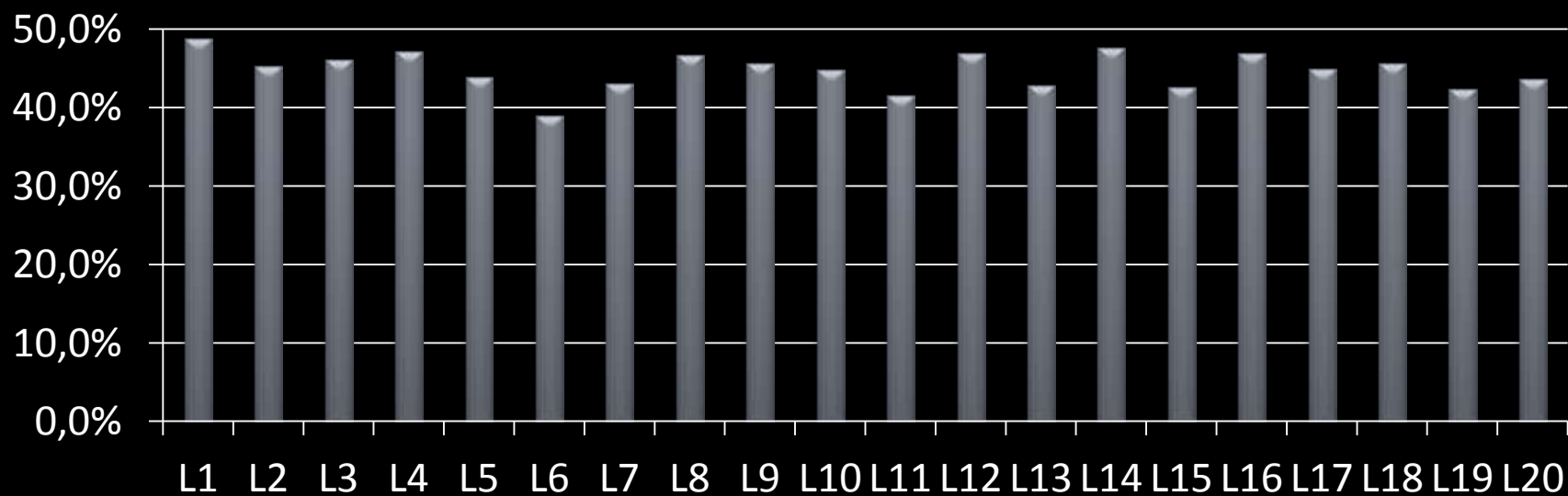
European Heart Journal
doi:10.1093/eurheartj/ehp2567

EXPERT CONSENSUS DOCUMENT



Third universal definition of myocardial infarction

Kristian Thygesen, Joseph S. Alpert, Allan S. Jaffe, Maarten L. Simoons, Bernard R. Chaitman and Harvey D. White: the Writing Group on behalf of the Joint ESC/ACCF/AHA/WHF Task Force for the Universal Definition of Myocardial Infarction



Udio naručenih Troponina T po liječnicima



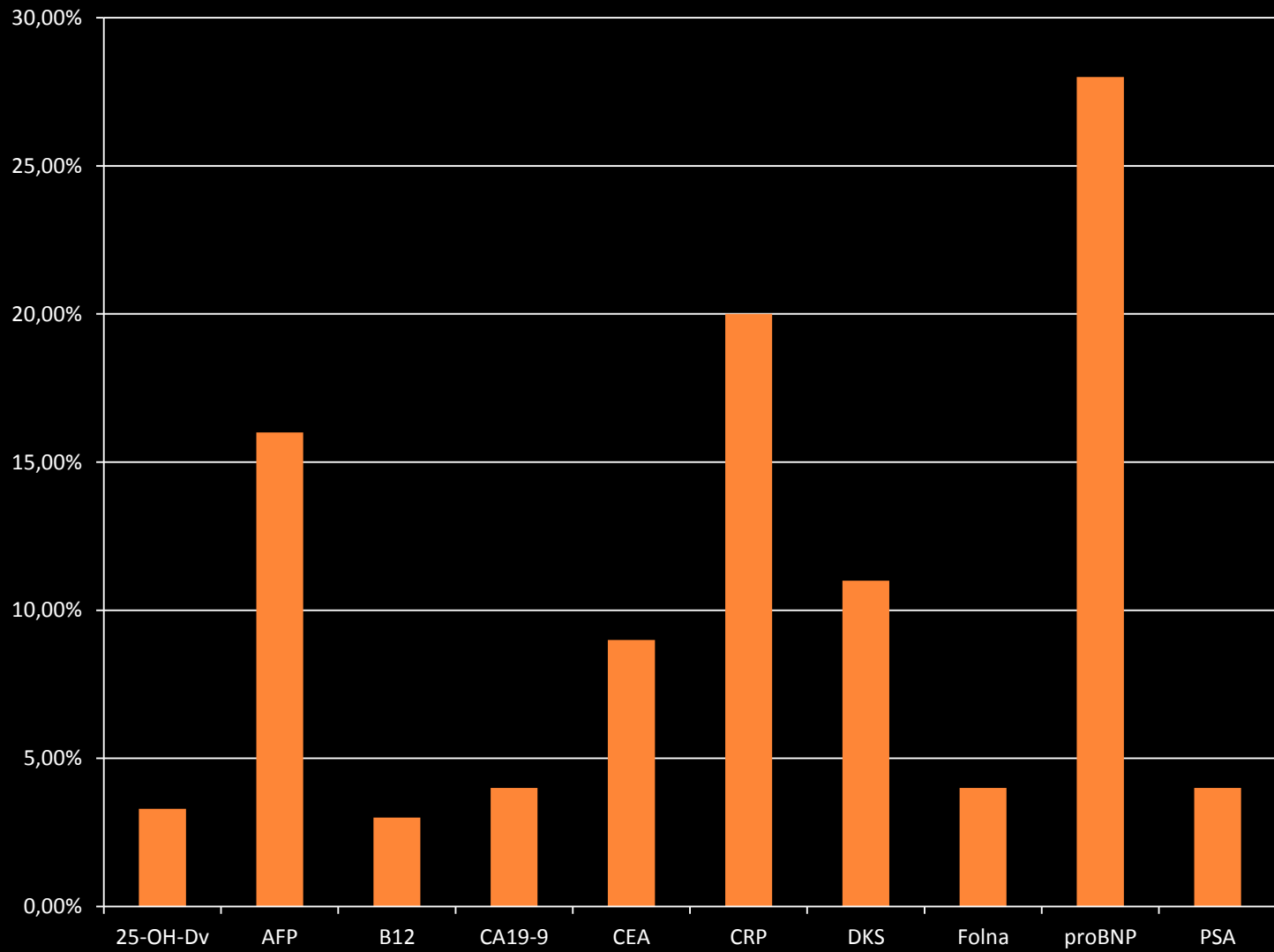
**The Association for
Clinical Biochemistry &
Laboratory Medicine**



The Royal College of Pathologists
Pathology: the science behind the cure

National Minimum Re-testing Interval Project:

A final report detailing consensus recommendations for
minimum re-testing intervals for use in Clinical Biochemistry



Postoje ne validirane pretrage za istog pacijenta ili pretrage za koje nije istekao rok u kojem ih je nepotrebno naručivati

	Pretraga		Bespotrebno u periodu	Vrijeme prijema	Vrijeme validacije	Rezultat
	Grupa	Naziv				
▶	Koagulacija	(P) PV		27.3.2015. 16:40:26		
	Koagulacija	(P) PV-INR		27.3.2015. 16:40:26		
	Koagulacija	(P) APTV		27.3.2015. 16:40:26		

BIS sučelje KBC Zagreb

– naručivanje laboratorijskih pretraga

☐ 1 L0001 - Glukoza (S)	☐ 1 L0017 - Kolesterol (S)	☐ 1 L0034 - Osmolalnost (S...	☐ 1 L0053 - Urati (U)	☐ 1 L0069 - Okultna krv (F)	☐ 1 L0842
☐ 1 L0002 - Bilirubin ukupni...	☐ 1 L0018 - Trigliceridi (S)	☐ 1 L0035 - Proteini ukupni...	☐ 1 L0054 - Kalij (dU)	☐ 1 L0070 - Ukupni lipidi (F)	☐ 1 L0843
☐ 1 L0003 - Bilirubin konjugi...	☐ 1 L0019 - HDL-kolesterol...	☐ 1 L0036 - CRP (S)	☐ 1 L0055 - Kalij (U)	☐ 1 L0071 - Probavljivost (F)	☐ 1 L0844
☐ 1 L0004 - Ureja (S)	☐ 1 L0020 - LDL-kolesterol (S)	☐ 1 L0039 - MOKRAĆA-Kv...	☐ 1 L0056 - Natrij (dU)	☐ 1 L0075 - Proteini ukupni...	☐ 1 L0845
☐ 1 L0005 - Kreatinin (S)	☐ 1 L0021 - Kalij (S)	☐ 1 L0040 - Morfologija eritr...	☐ 1 L0057 - Natrij (U)	☐ 1 L0076 - LDH-IZLJEV (a...	☐ 1 L0846
☐ 1 L0006 - Urati (S)	☐ 1 L0022 - Natrij (S)	☐ 1 L0041 - Melanin (U)	☐ 1 L0058 - Kloridi (dU)	☐ 1 L0077 - Glukoza - IZLJ...	☐ 1 L0847
☐ 1 L0007 - ALP (S)	☐ 1 L0023 - Kloridi (S)	☐ 1 L0042 - Hemosiderin (U)	☐ 1 L0059 - Kloridi (U)	☐ 1 L0078 - Sediment - IZLJ...	☐ 1 L0848
☐ 1 L0008 - AST (S)	☐ 1 L0024 - Kalcij ukupni (S)	☐ 1 L0044 - Osmolalnost (U...	☐ 1 L0060 - Kalcij (dU)	☐ 1 L0080 - Natrij (znoj)	☐ 1 L0849
☐ 1 L0009 - ALT (S)	☐ 1 L0025 - Fosfati an. (S)	☐ 1 L0045 - Amilaza (U)	☐ 1 L0061 - Kalcij (U)	☐ 1 L0081 - Kalij (znoj)	☐ 1 L0850
☐ 1 L0010 - GGT (S)	☐ 1 L0026 - Magnezij uk.(S)	☐ 1 L0046 - Glukoza (dU)	☐ 1 L0062 - Fosfati an.(dU)	☐ 1 L0083 - Klirens kreatinina	☐ 1 L0851
☐ 1 L0011 - CK (S)	☐ 1 L0027 - Željezo (S)	☐ 1 L0047 - Glukoza (U)	☐ 1 L0063 - Fosfati an.(U)	☐ 1 L0084 - Desferalski test...	☐ 1 L0852
☒ 1 L0012 - CK-MB (S)	☐ 1 L0028 - UIBC (S)	☐ 1 L0048 - Ureja (dU)	☐ 1 L0064 - Magnezij ukupn...	☐ 1 L0085 - Pokus acidifika...	☐ 1 L0853
☐ 1 L0013 - LD (S)	☐ 1 L0029 - TIBC (S)	☐ 1 L0049 - Ureja (U)	☐ 1 L0065 - Magnezij ukupn...	☐ 1 L0086 - Procjena GFR-...	☐ 1 L0854
☐ 1 L0014 - Amilaza (S)	☐ 1 L0030 - Bakar (S)	☐ 1 L0050 - Kreatinin (dU)	☐ 1 L0066 - Bakar (dU)	☐ 1 L0087 - Procjena GFR-...	☐ 1 L0855
☐ 1 L0015 - Lipaza (S) na p...	☐ 1 L0031 - Cink (S)	☐ 1 L0051 - Kreatinin (U)	☐ 1 L0067 - Proteini ukupni...	☐ 1 L0092 - Osmolalnost (dU)	☐ 1 L0933
☐ 1 L0016 - ACE (S)	☐ 1 L0033 - Selen (S)	☐ 1 L0052 - Urati (dU)	☐ 1 L0068 - Proteini ukupni...	☐ 1 L0093 - Vađenje kapilar...	☐ 1 L0973

Prošli nalaz CEA izrađen
22.9.2015

Rezultat: 3.6 ng/ml

Prema važećim smjernicama
(www.nacb.guidelines)
ponavljanje pretrage se
preporučuje nakon minimalno
30 dana

☐ OK, odustajem

☒ Treba učiniti pretragu

Razlog:

“Let us cultivate our garden”

Voltaire, Candide

