4º SIMPOSIO MEDICINA CARDIOVASCULAR
CENTENARIO 2018

Infarto agudo de miocardio:
"Tiempo es músculo"

Pensando en la reperfusión

Dr. Pedro Zangroniz

www.hemodinamiahpc.com.ar

UNIVERSIDAD NACIONAL DE ROSARIO

CENTENARIO HOSPITAL PROVINCIAL

HEMODINAMIA CENTENARIO

Infarto Agudo de Miocardio

Aspectos Históricos

Coronary Thrombosis

Causes

Myocardial Necrosis

Herrick, JB. Clinical features of sudden obstruction of the coronary arteries. *JAMA* 59:2015-20, 1912.

The Journal of the American Medical Association

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VOL. LIX, No. 23 CHICAGO, ILLINOIS DECEMBER 7,

CLINICAL FEATURES OF SUDDEN OBSTRUCTION OF THE CORONARY ARTERIES

JAMES B. HERRICK, M.D.
CHICAGO

Obstruction of a coronary artery or of any of its large branches has long been regarded as a serious accident. Several events contributed toward the prevalence of the view that this condition was almost always suddenly fatal. Parry's writings on angina pectoris and its relation to coronary disease, Jenner's observations on the same condition centering about John Hunter's case, Thorvaldsen's tragic death in the theater in Copenhagen with the finding of a plugged coronary, sharply attracted attention to the relation between the coronary and sudden death. In Germany Cohnheim supported the views of Hyrtl and Henle as to lack of considerable anastomosis, and as late as 1881 lent the influence of his name to the doctrine that the coronary arteries were end-arteries; his Leipsic necropsy experience, as well as experiments on dogs, forced him to conclude that the sudden occlusion of one of these vessels or of one of the larger branches, such as the ramus descendens of the left coronary, meant death within a few minutes. Others emphasized the same view.

No one at all familiar with the clinical, pathologic or experimental features of cardiac disease can question the importance of the coronaries. The influence of sclerosis of these vessels in the way of producing anemic necrosis and fibrosis of the myocardium, with such possible results as aneurysm, rupture or dilatation of the heart, is well known. So also is the relation of the coronaries to many cases of angina pectoris, and to cardiac disturbances rather indefinitely classed as chronic myocarditis, cardiac irregularities, etc. It must be admitted, also, that the reputation of the descending branch of the left coronary as the artery of sudden death is not undeserved.

The coronaries are not so strictly end-arteries, with merely capillary anastomoses, as Cohnheim others thought. By careful dissections, by injec of one artery from another, by skiagraphs of inj arteries and by direct inspection of hearts made t lucent by special methods, there is proof of an anat anastomosis that is by no means negligible.

Jamin and Merkel's† beautiful stereoscopic skia show the remarkably rich blood-supply of the with occasional anastomoses between vessels of con able size. The possibility of injection of one cor artery from the other is admitted even by thos deny that such injection proves more than non-functioning anastomosis. Amenomiya ing hearts of young persons, showed naked moses in the subepicardial tissue. He feels that H and Spalteholz[2] have nearly cleared up the questio to the relation between the heart muscle and disea the coronary artery from the anatomic standp Hirsch says that in dogs the anastomosing ves functionally competent, and Spalteholz says tha man the vessels are nearly the same as in dogs, in anastomoses even in those of considerable cal The latter investigator, by a method of injection treatment of the heart so as to make the muscle t parent, shows to the naked eye that there are an moses of considerable size.

Among others who are on record as believing there are non-negligible anastomoses may be menti Haller, Huchard, Orth, Michaelis, Langer, Legg, W All recognize, however, that there are individual di ences, and also that though the heart may show anastomoses, these are not necessarily functional, that an artery which anatomically is not a term artery may yet be such functionally.

But there is proof not only of anatomic connec between the two coronaries, but that in certain insta at least, such connection is of functional value. Ex ments on lower animals and the clinical experimen disease of the coronaries with autopsy findings

Infarto Agudo de Miocardio
Historia de su evolución

- 1º Etapa: **Observación Clínica** (desde su descubrimiento hasta los años 60)
- 2º Etapa: **Creación de las U.C.C.** (década del 60. Marcada disminución de la mortalidad)
- 3º Etapa: **Reperfusión** (Década del 80)

UNIVERSIDAD NACIONAL DE ROSARIO

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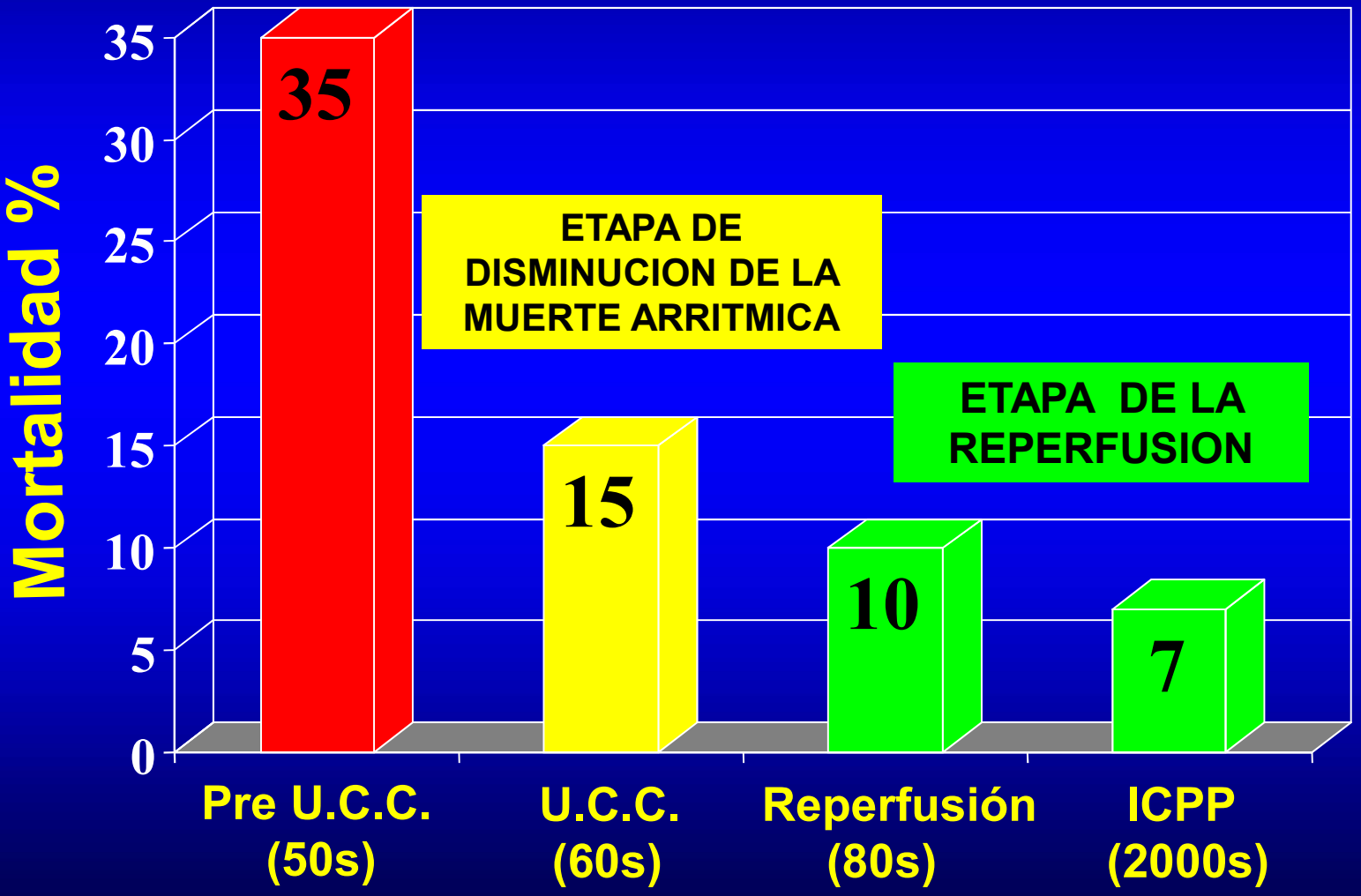
HEMODINAMIA CENTENARIO

Evolución de la Mortalidad



Métodos para lograr la reperfusión

TRATAMIENTO TROMBOLITICO I.V.

ANGIOPLASTIA CORONARIA

Administración intracoronaria de fibrinolíticos en Infarto Agudo de Miocardio

ОРИГИНАЛЬНЫЕ СТАТЬИ

УДК 616.127-005.8-036.11-085.273.55-032:611.132.2

Е. И. Чазов, Л. С. Матвеева, А. В. Мазаев, К. Е. Саргин, Г. В. Садовская, М. Я. Руда

ВНУТРИКОРОНАРНОЕ ВВЕДЕНИЕ ФИБРИНОЛИЗИНА ПРИ ОСТРОМ ИНФАРКТЕ МИОКАРДА

Всесоюзный кардиологический научный центр (дир.— акад. АМН СССР Е. И. Чазов) АМН СССР, Москва

EI Chazov
Ter Arkh vol. 48, 1976

Rusia. Ter Arkh 1976;48:8–19

Prevalencia de Oclusión Coronaria Total durante las horas tempranas del Infarto de miocardio transmural

Abstract

To define the prevalence of total coronary occlusion in the hours after transmural myocardial infarction, we used coronary arteriography to study the degree of coronary obstruction in 322 patients admitted within 24 hours of infarction. Total coronary occlusion was observed in 110 of 126 patients (87 per cent) who were evaluated within four hours of the onset of symptoms; this proportion decreased significantly, to 37 of 57 (65 per cent), when patients were studied 12 to 24 hours after the onset of symptoms. Among 59 patients with angiographic features of coronary thrombosis, the thrombus was retrieved by Fogarty catheter in 52 (88 per cent) but was absent in seven (12 per cent false positive). Among an additional 20 patients without angiographic features of thrombosis, a thrombus was discovered in five (25 per cent false negative). Thus, total coronary occlusion is frequent during the early hours of transmural infarction and decreases in frequency during the initial 24 hours, suggesting that coronary spasm or thrombus formation with subsequent recanalization or both may be important in the evolution of infarction. (N Engl J Med. 1980; 303:897–902.)

De Wood, M. N Engl J Med 1980;303:897–902

Infarto Agudo de Miocardio

FDA Approvals of Thrombolytic Therapy

1977: Various thromboembolic conditions, not for AMI

1982: Intracoronary SK for AMI

1987: Intravenous SK and rTPA for AMI

Gruppo Italiano per lo Studio della Streptochinasi nell'Infarto Miocardico (GISSI). Effectiveness of intravenous thrombolytic treatment in acute myocardial infarction. Lancet 1986;1:397–402

Métodos para lograr la reperfusión
(Década del 90)

Angioplastia **Trombolíticos**

Percepción en los 90´de los doctores que hacen ATCp

Articles The Lancet Volume 361, No. 9351, p13–20, 4 January 2003

Primary angioplasty versus intravenous thrombolytic therapy for acute myocardial infarction: a quantitative review of 23 randomised trials

Ellen C Keeley, Judith A Boura, Cindy L Grines

Summary

Background Many trials have been done to compare primary [illegible] thrombolytic-eligible patients with ST-segment elevation AMI to primary PTCA (n=3872) or thrombolytic therapy (n=3867). Streptokinase was used in eight trials (n=1837), and fibrin-specific agents in 15 (n=5902). Most patients who received thrombolytic therapy (76%, n=2939) received a fibrin-specific agent. Stents were used in 12 trials, and platelet glycoprotein IIb/IIIa inhibitors were used in eight. We identified short-term and long-term clinical outcomes of death, non-fatal reinfarction, and stroke, and did subgroup analyses to assess the effect of type of thrombolytic agent used and the strategy of emergent hospital transfer for primary PTCA. All analyses were done with and without inclusion of the SHOCK trial data.

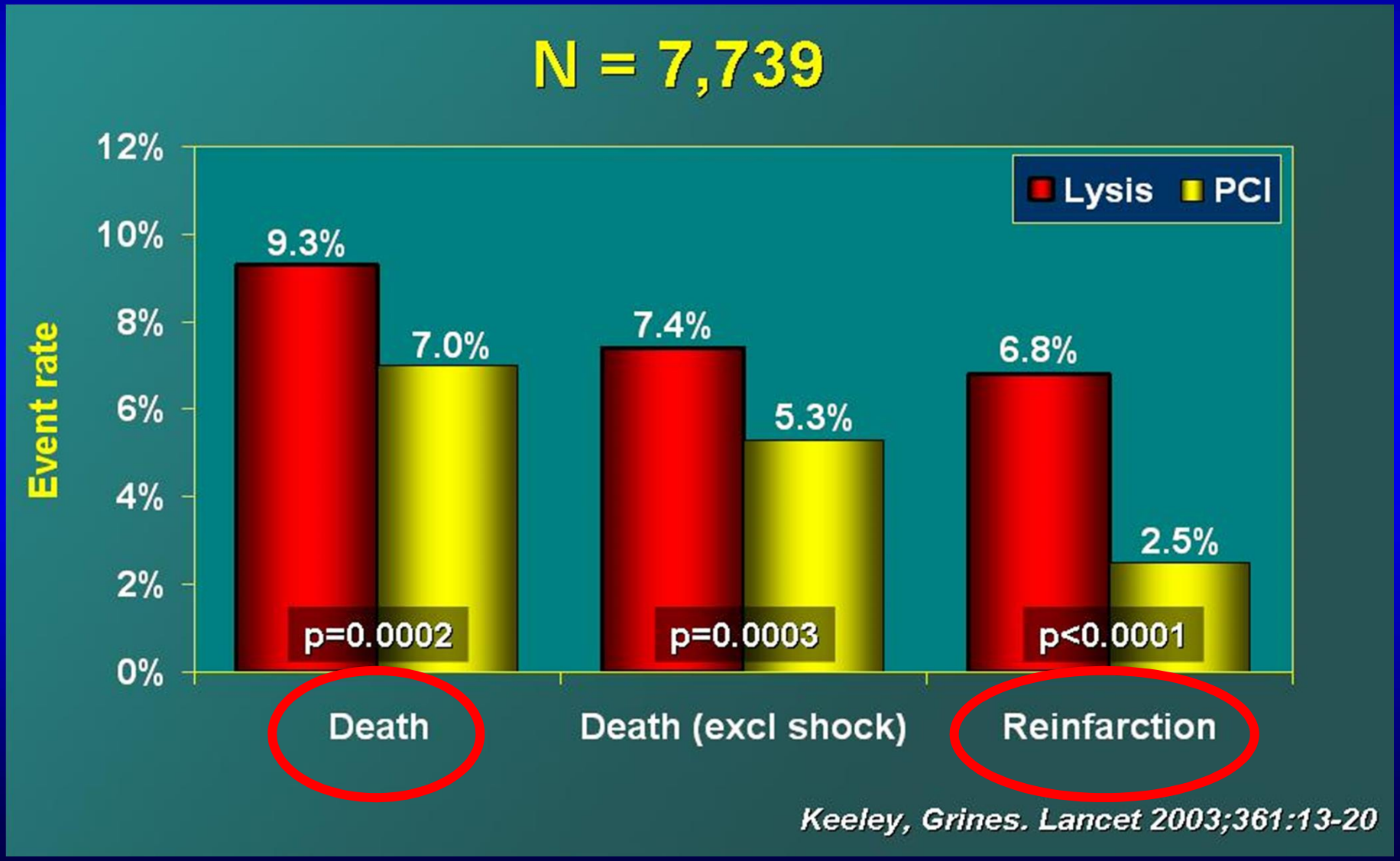
Introduction

In the mid-1970s, acute myocardial infarction (AMI) was identified in nearly all cases as being the result of a [illegible] that the prompt restoration of flow salvages myocardium, reduces infarct size, and prolongs life has been the driving force behind a large number of clinical trials, assessing thrombolytic therapy for AMI. The results of these trials, done in the early 1980s and involving tens of thousands of patients, unequivocally showed that thrombolytic therapy resulted in preserved left-ventricular function and decreased mortality in patients with AMI.[3]

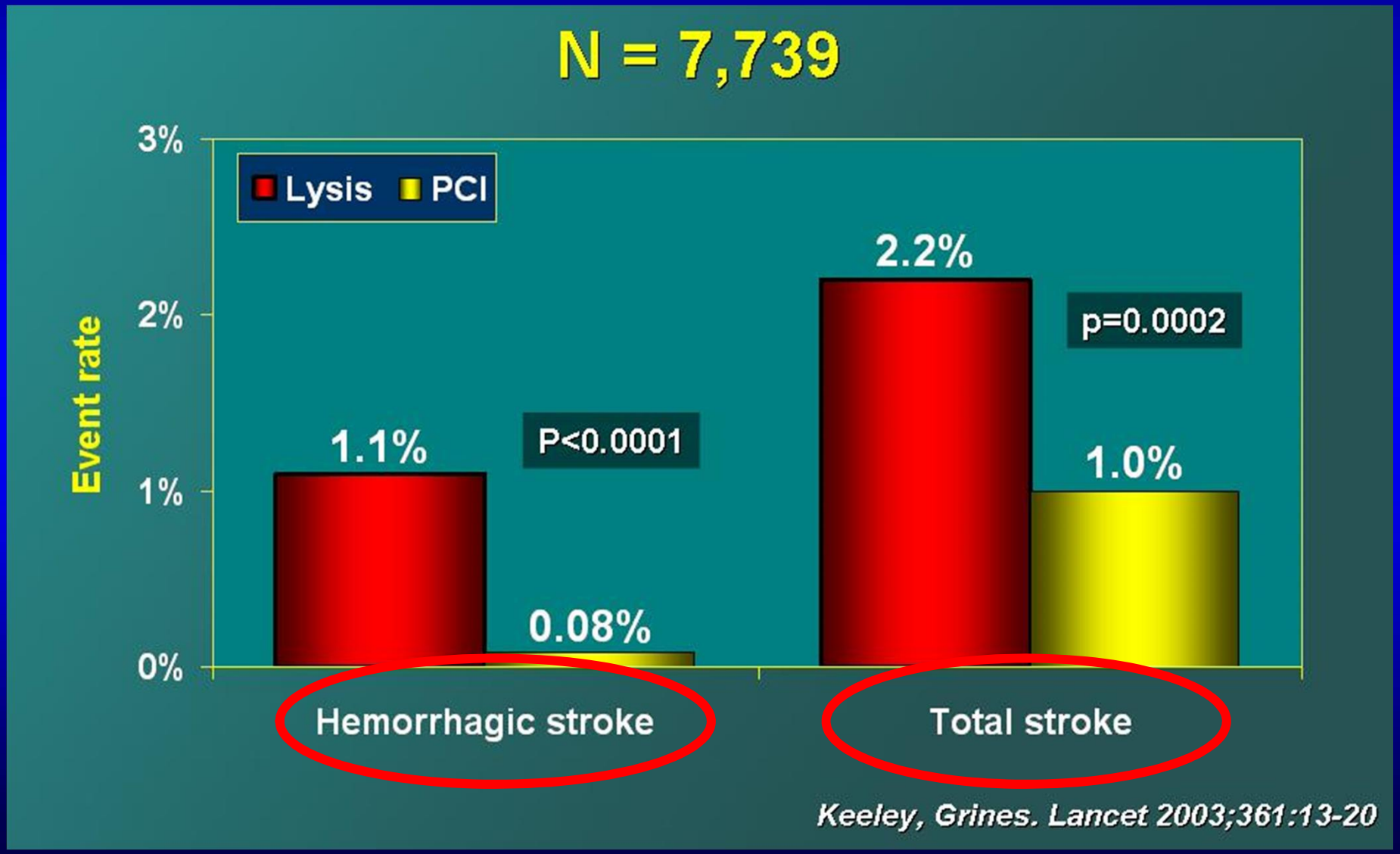
Primary percutaneous transluminal coronary angioplasty (PTCA), defined as balloon angioplasty undertaken as the primary reperfusion strategy for AMI without previous or concomitant thrombolytic therapy, was initially compared with intracoronary thrombolytic therapy.[4] Over the next decade, ten trials, comparing primary PTCA with intravenous thrombolytic therapy for

Metaanálisis de 23 estudios randomizados

23 Estudios Randomizados de Angioplastia Vs. Trombolíticos



23 Estudios Randomizados de Angioplastia Vs. Trombolíticos



VENTAJAS de la Angioplastia sobre los Trombolíticos

- Menor mortalidad
- Menor tasa de reinfarto
- Menor incidencia de stroke (ACV)
- Mejoría en la función ventricular

Métodos para lograr la reperfusión
(Década del 2000)

Angioplastia

Trombolíticos

La angioplastia coronaria es superior a los trombolíticos

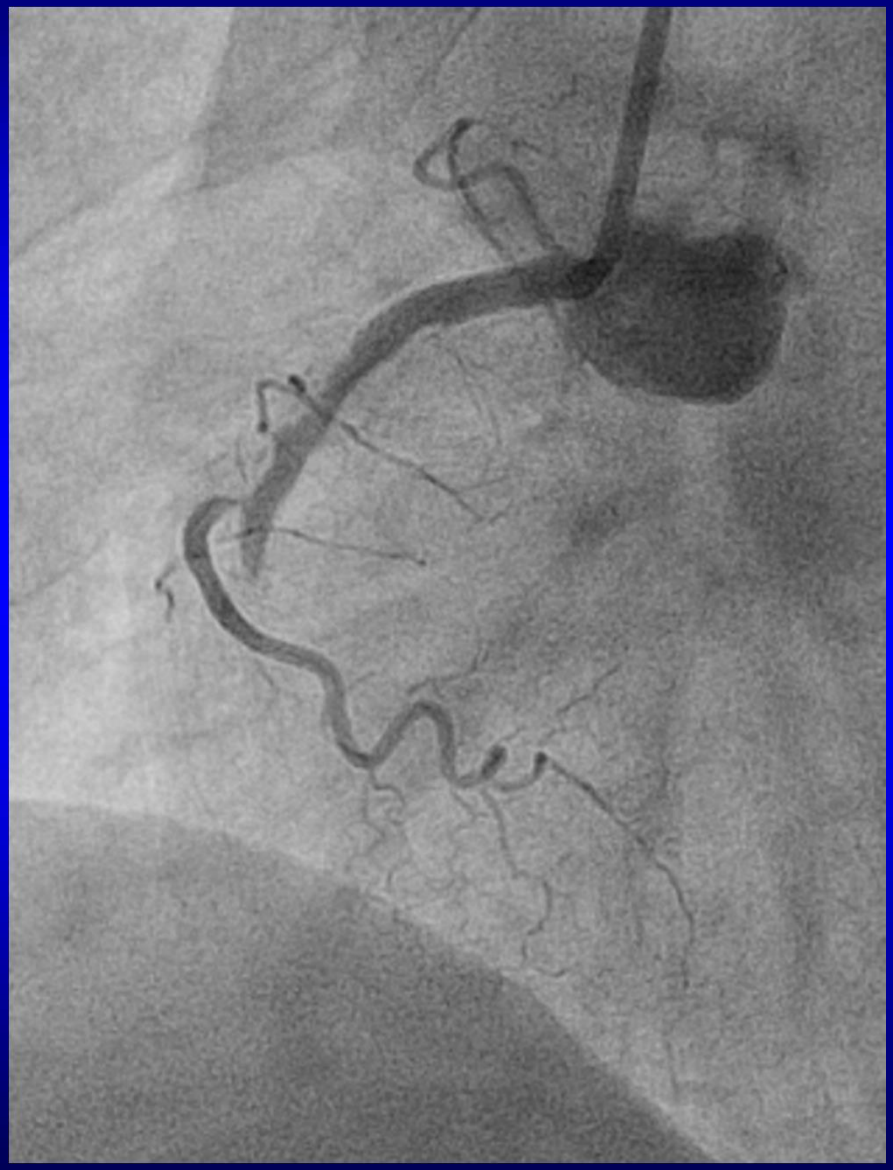
pero ….

siempre y cuando se cumplan 2 condiciones

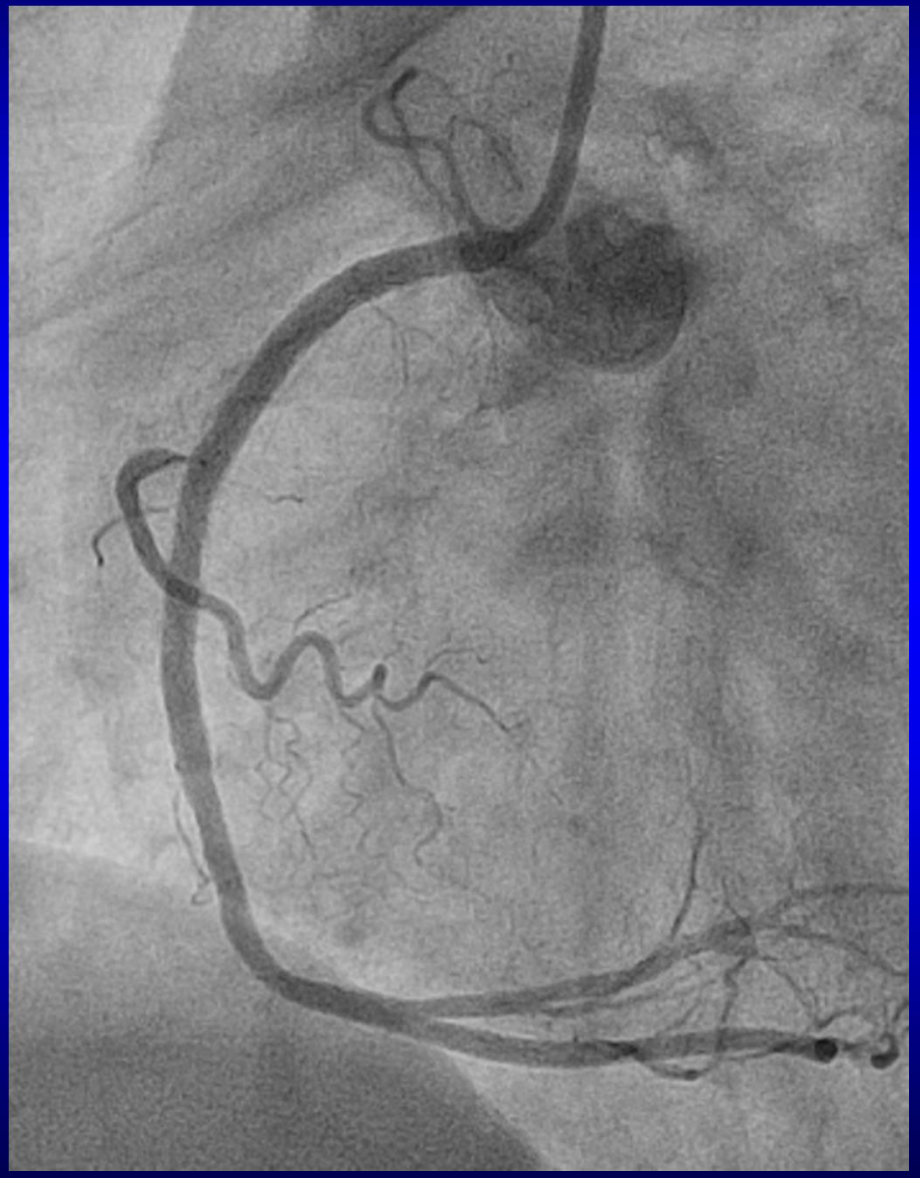
1) El tiempo de implementación debe ser < de 120 m

2) El grupo de trabajo que realiza la angioplastia debe estar bien entrenado como así también la institución

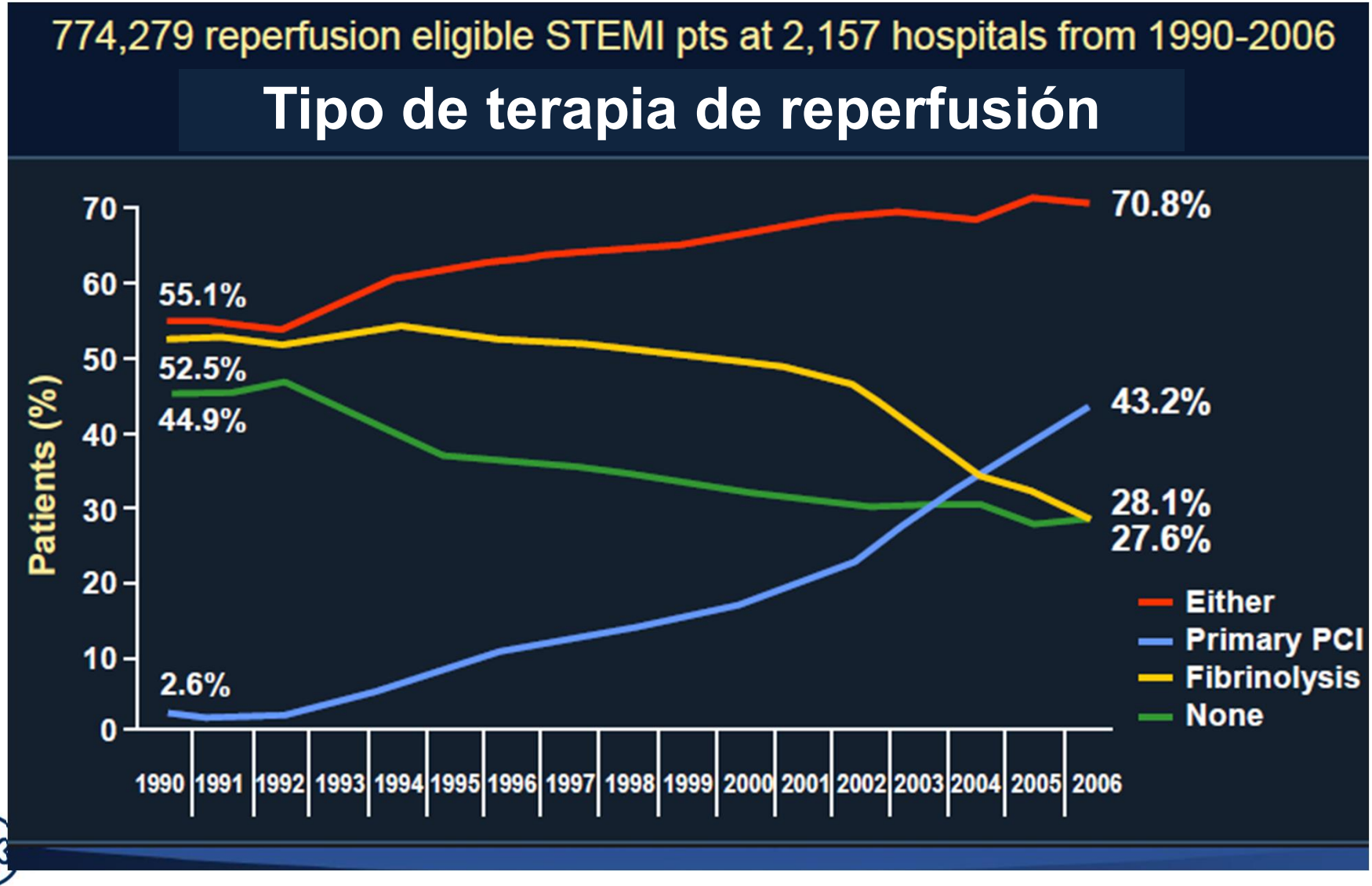
PRE ANGIOPLASTIA



POST ANGIOPLASTIA



NRMI: Evolución de la reperfusión



NOV 13, 2006

THE NATION'S NEWSPAPER

USA TODAY

NO. 1 IN THE USA

Newsline

Hospitals too slow on heart attacks

Study finds only 35% react quickly enough

By Steve Sternberg
USA TODAY

CHICAGO – Only about one-third of hospitals provide emergency care to heart attack patients quickly enough to meet scientific guidelines for saving lives, researchers report today.

Even top performers meet American Heart Association and American College of Cardiology (ACC) guidelines for care in only half their cases, researchers say.

"Even among the better hospitals, only a few hospitals routinely meet the recommended guidelines," says Yale cardiologist Harlan Krumholz, a leader of the research team and an architect of a national campaign launched Sunday to help hospitals improve their performance. "By next year, we're going to change that."

About 200,000 people a year have heart attacks caused by blockages in crucial arteries supplying the heart with blood. About 14,000 patients die of these heart attacks in hospitals each year.

Studies show that reopening clogged arteries by inflating a tiny balloon at the site of the blockage is the best way to treat a severe heart attack. The procedure, balloon angioplasty, can cut a patient's risk of dying by 40%, but only if it is done within 90 minutes of the patient's arrival at the hospital, the so-called door-to-balloon time.

If every hospital met the guidelines, Krumholz says, doctors could save about 1,000 lives each year. A study out in March in the journal Circulation showed that 80% of people live within an hour's drive of a hospital that provides balloon angioplasty.

Yet only about one-third of heart attack patients get angioplasty within the 90-minute window. The new study surveyed 366 hospitals to determine what procedures they have in place to get patients angioplasty quickly. Only 35% report an average door-to-balloon time of 90 minutes or less, 48% had a door-to-balloon time of 91 to 120 minutes, 13% came in at 121 to 150 minutes, and 4% topped 150.

The study, sponsored by the National Heart, Lung and Blood Institute, will be released today at an AHA meeting and has been posted online by the *New England Journal of Medicine*. Hospitals agreed to participate if they weren't individually identified. Doctors said consumers can get an approximate measure of many hospitals' response times by checking a U.S. government website, www.hospitalcompare.hhs.gov.

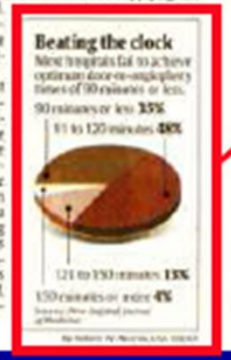
The study was designed to help launch the new campaign, called D2B, for door-to-balloon, by providing hospitals with ways to improve performance. "We're losing too many lives," says Steven Nissen of the Cleveland Clinic and president of the ACC.

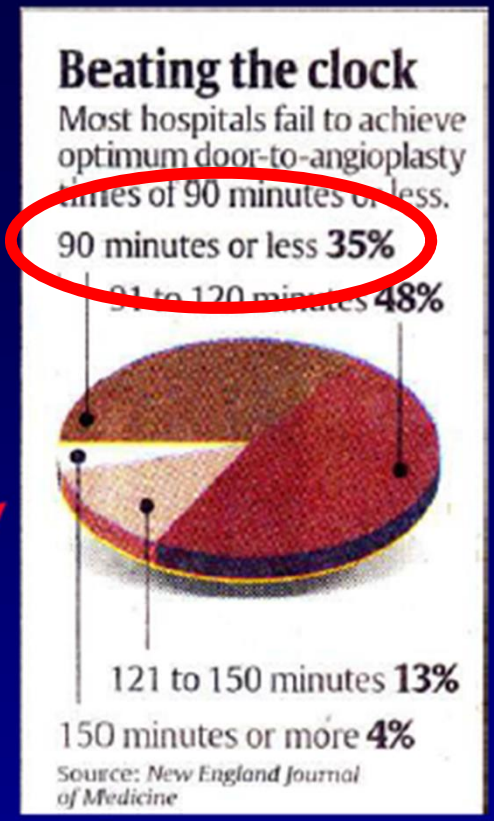
Momentum for change is building, Krumholz says, noting that hospitals, insurers and government agencies have signed on. Among the participants: United Healthcare, Premier Health Care Services, Aetna, WellPoint Inc. and Blue Cross Blue Shield.

The study found that the system works best when:

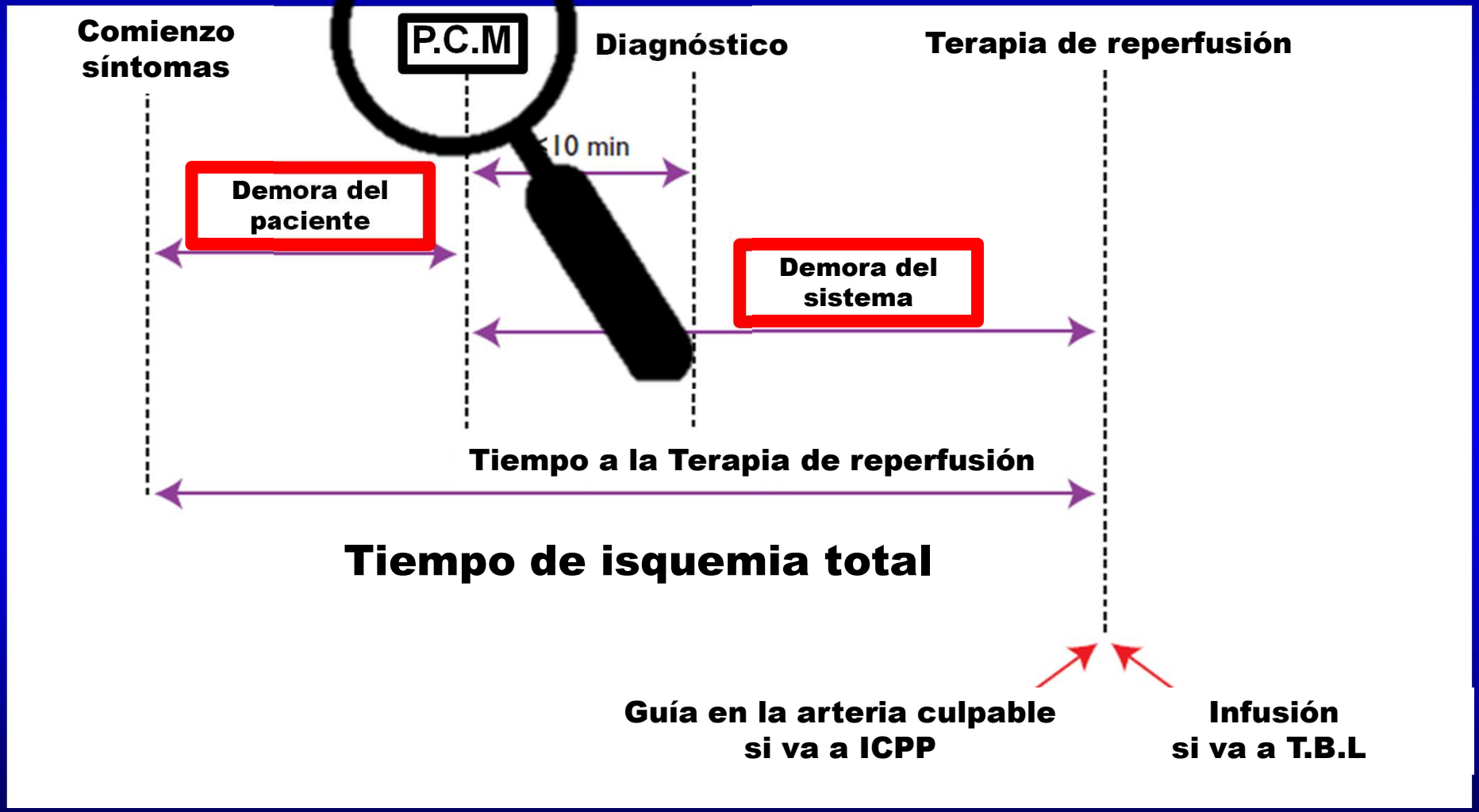
- Paramedics perform an electrocardiogram en route to the hospital.
- The ER doctor uses it to activate the angioplasty team without waiting to consult with anyone else.
- A page operator can reach each member of the team so they can arrive within 20 minutes.
- The hospital posts feedback on each case for the angioplasty and ER teams.

Whatever option is offered, minutes count. "You've had a heart attack. You've rushed to the hospital, and now you're waiting for a procedure to open the blocked age," Krumholz says. "Most Americans wait two hours or more. And every minute you wait, your heart is being deprived of oxygen."





Componentes de la demora en el IAMCEST



Por que es importante evitar la demora en el IAM ???

2 Razones principales

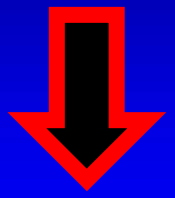
1) El tiempo + crítico de un I.A.M. es la fase más temprana por el riesgo de paro cardíaco de causa arrítmica

CARDIODEFIBRILADOR

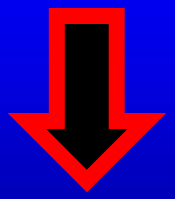
2) La rapidez en instaurar la terapia de reperfusión nos permite salvar músculo y por ende disminuir la mortalidad

REPERFUSION

TIEMPO ES MUSCULO

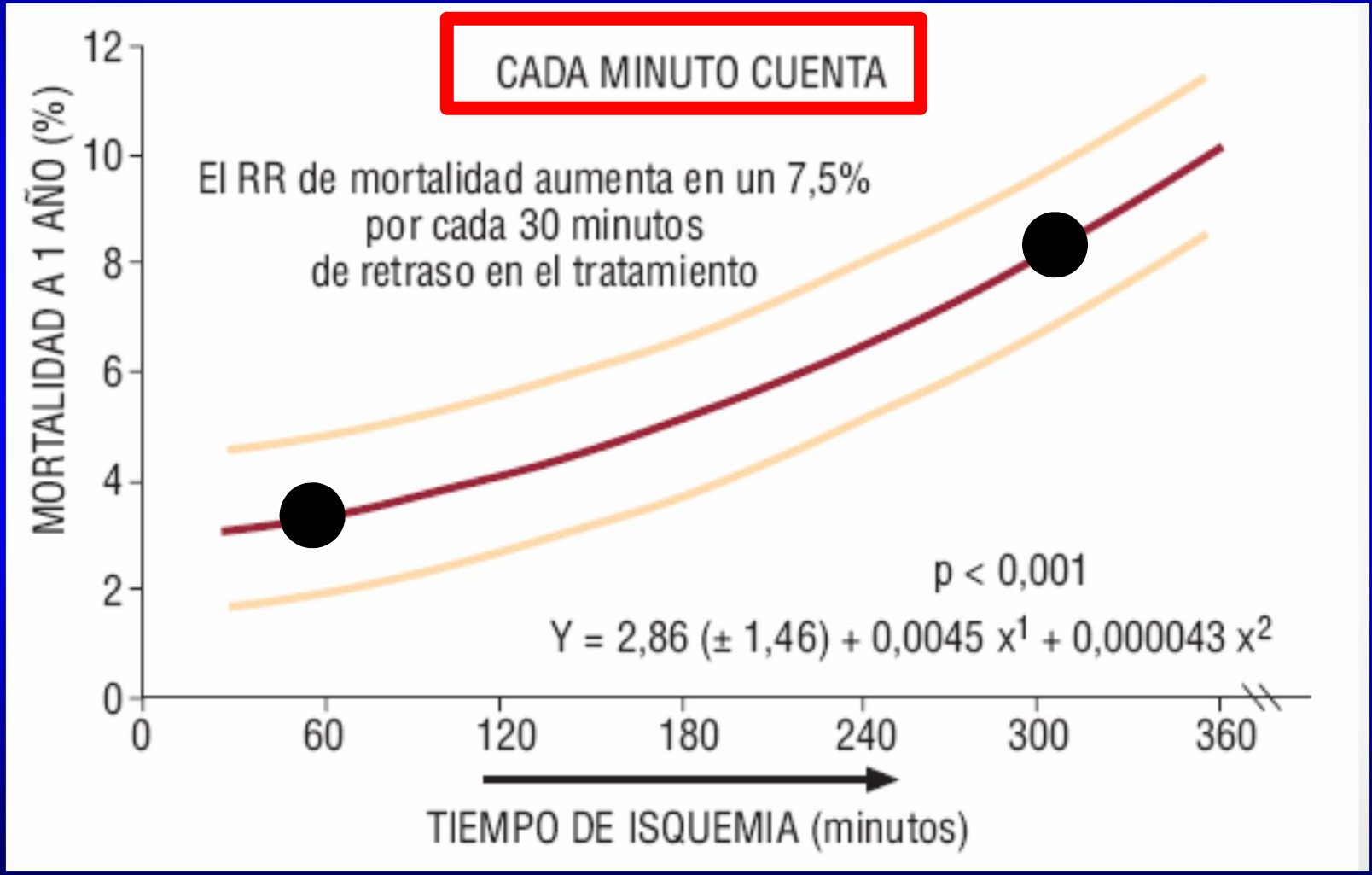


TIEMPO QUE SE DEMORA EN INSTAURAR LA REPERFUSION



MUSCULO QUE MUERE

TIEMPO ES MUSCULO



De Luca G. Circulation. 2004;109:1223-5.

EL TRATAMIENTO DEL INFARTO ES UNA CARRERA CONTRA EL TIEMPO

¿ Qué debemos lograr?

Establecer sistemática para reperfundir a la mayor cantidad de pacientes

Paciente con IAMCEST

Centro con capacidad ICPp

S.E.M. o Centro sin ICPp

Realizar ICP-p

Trombolíticos

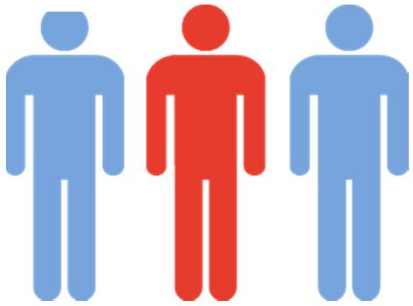
Sala de Hemodinamia

Derivar para ICP Rescate o Fármaco invasiva (2-24 hs)

Stent for Li of Percutaneous Cardiovascular Interventions (EAPCI), a registered branch of the European Society of Cardi

Guías ESC/AHA

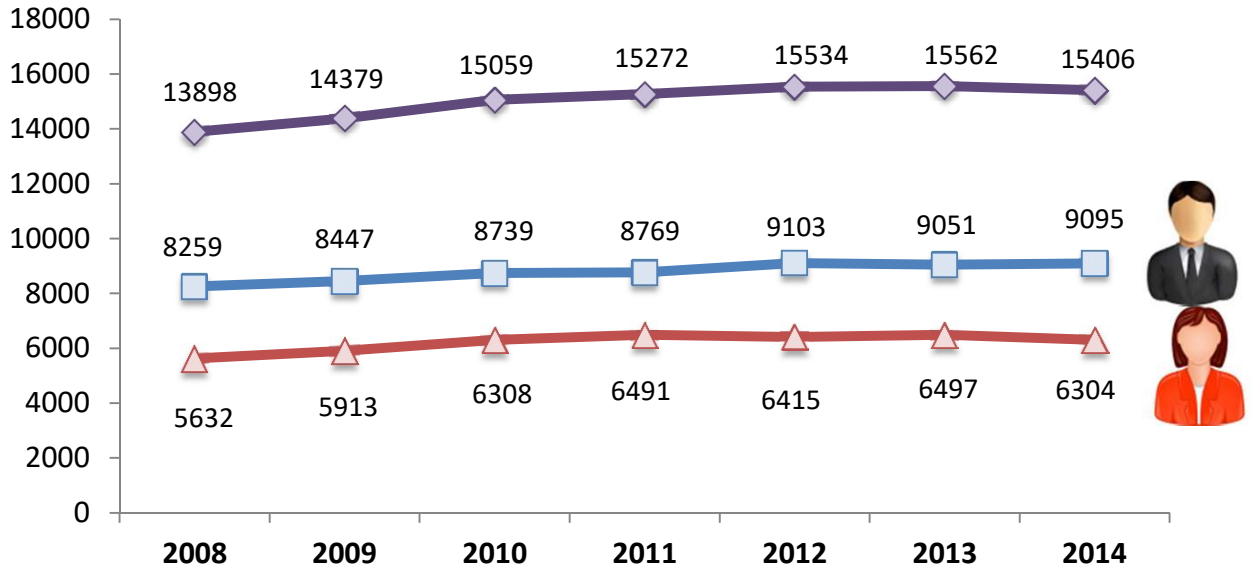
El Problema es grave !!!



1 de cada 3 muertes en Argentina son x Enfermedad Cardiovascular

28.3%

Muertes x Infarto en Argentina 15.406 en 2014



Una muerte en R.A. por I.A.M. cada 34 minutos

Situación del IAM en Argentina

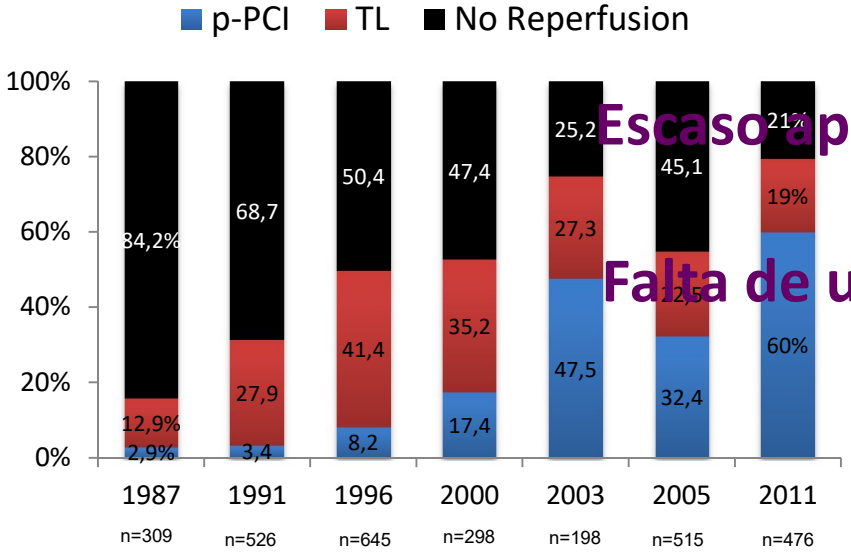
Baja calidad datos

Ausencia Registro Nacional

Estrategia de Reperfusión

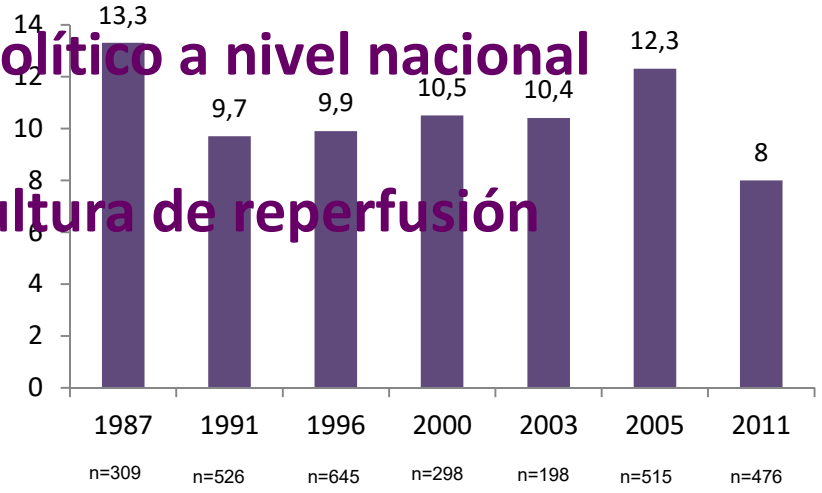
Ausencia Programa Nacional Infarto

Mortalidad Infarto

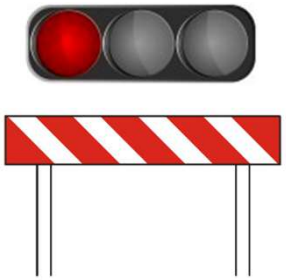


Escaso apoyo político a nivel nacional

Falta de una Cultura de reperfusión



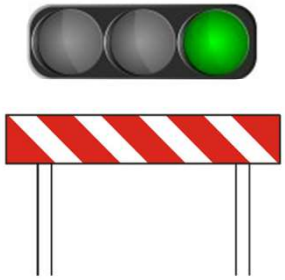
Barreras más importantes en Argentina



País Extenso

Sistema de Salud Fragmentado

Ausencia Cultura de Reperfusión



Múltiples SEM

- Sin protocolos de derivación
- Sin Electrocardiógrafo
- Sin personal entrenado
- **Ausencia de Número Universal**

Escaso apoyo político

Múltiples Centros con y sin Hemodinamia

- Falta de organización puertas adentro
- Sin protocolos de manejo IAMCEST
- Pocos programas puerta-balón
- Falta de personal entrenado

Cambio de paradigma

Viejo Paradigma

Rápida
Completa
Sostenida

TBL
vs.
ATC

IAMCEST

Nuevo Paradigma

ECG
Prehosp.

Red

Traslado

HEMODINAMIA CENTENARIO

G.I.T.MU.PRO. I.A.M.

RED DE HOSPITALES PUBLICOS DE ROSARIO
GRUPO GITMUPRO - IAM

Grupo Integrado de Trabajo MUnicipal y PROvincial para el tratamiento del IAM

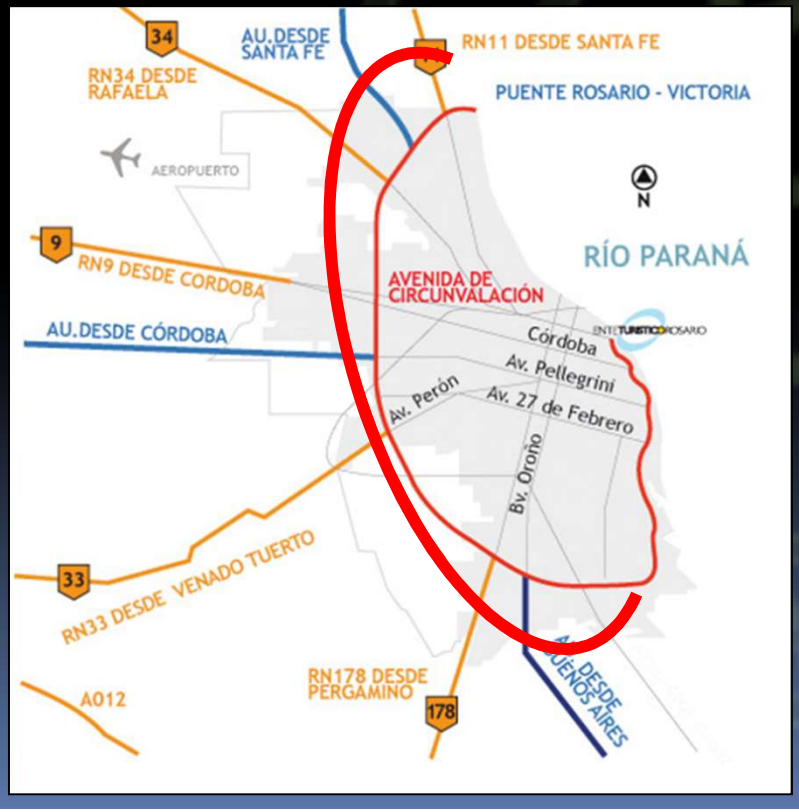
Dr. Pedro Daniel Zangroniz

www.hemodinamiahpc.com.ar

HEMODINAMIA CENTENARIO

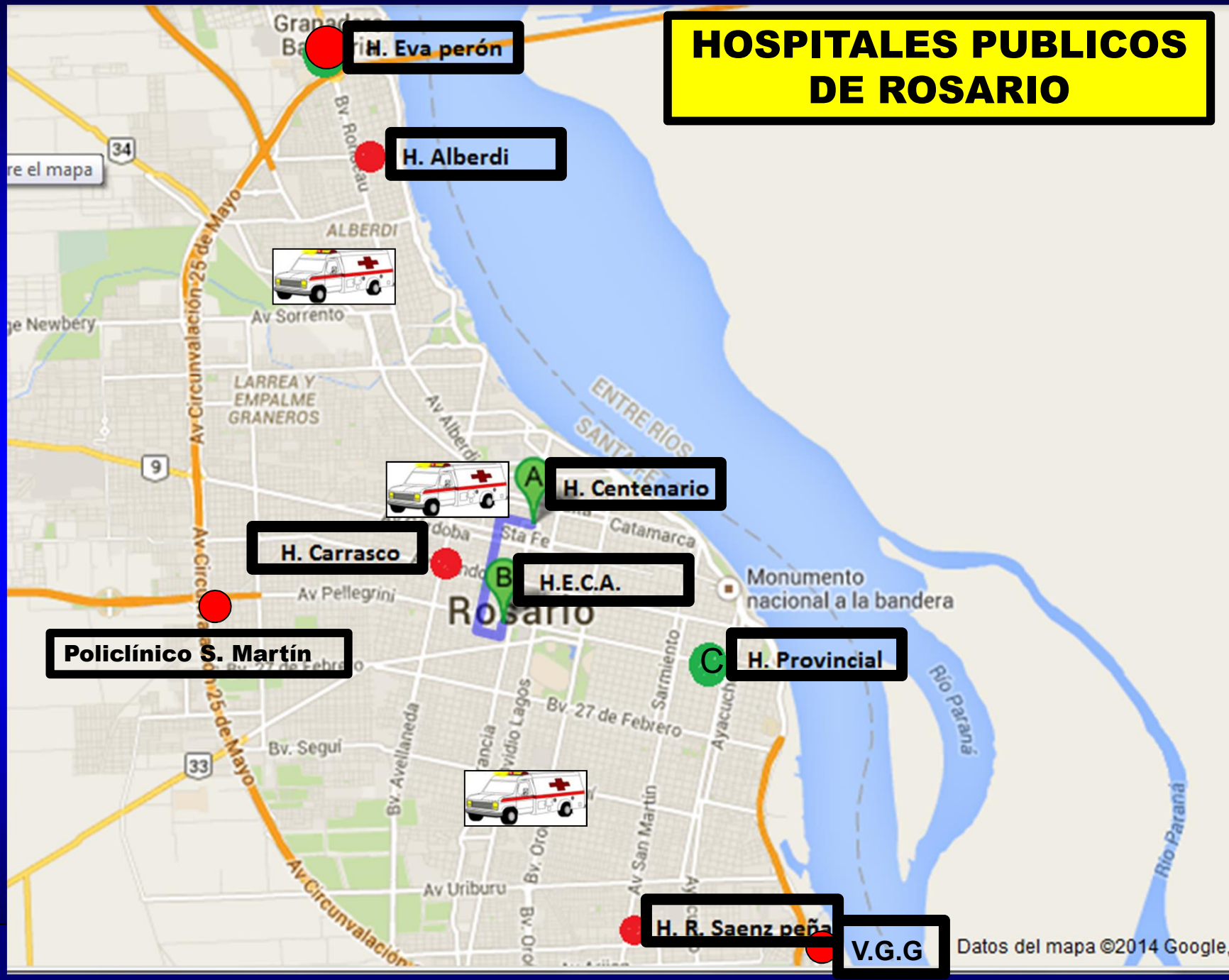
G.I.T.MU.PRO. I.A.M.

Desde el 1/11/2014 pusimos en marcha una Red Integrada entre los Hospitales Públicos de Rosario, tanto municipales como provinciales, con base en el Hospital Provincial del Centenario para la atención del paciente con IAMCEST.



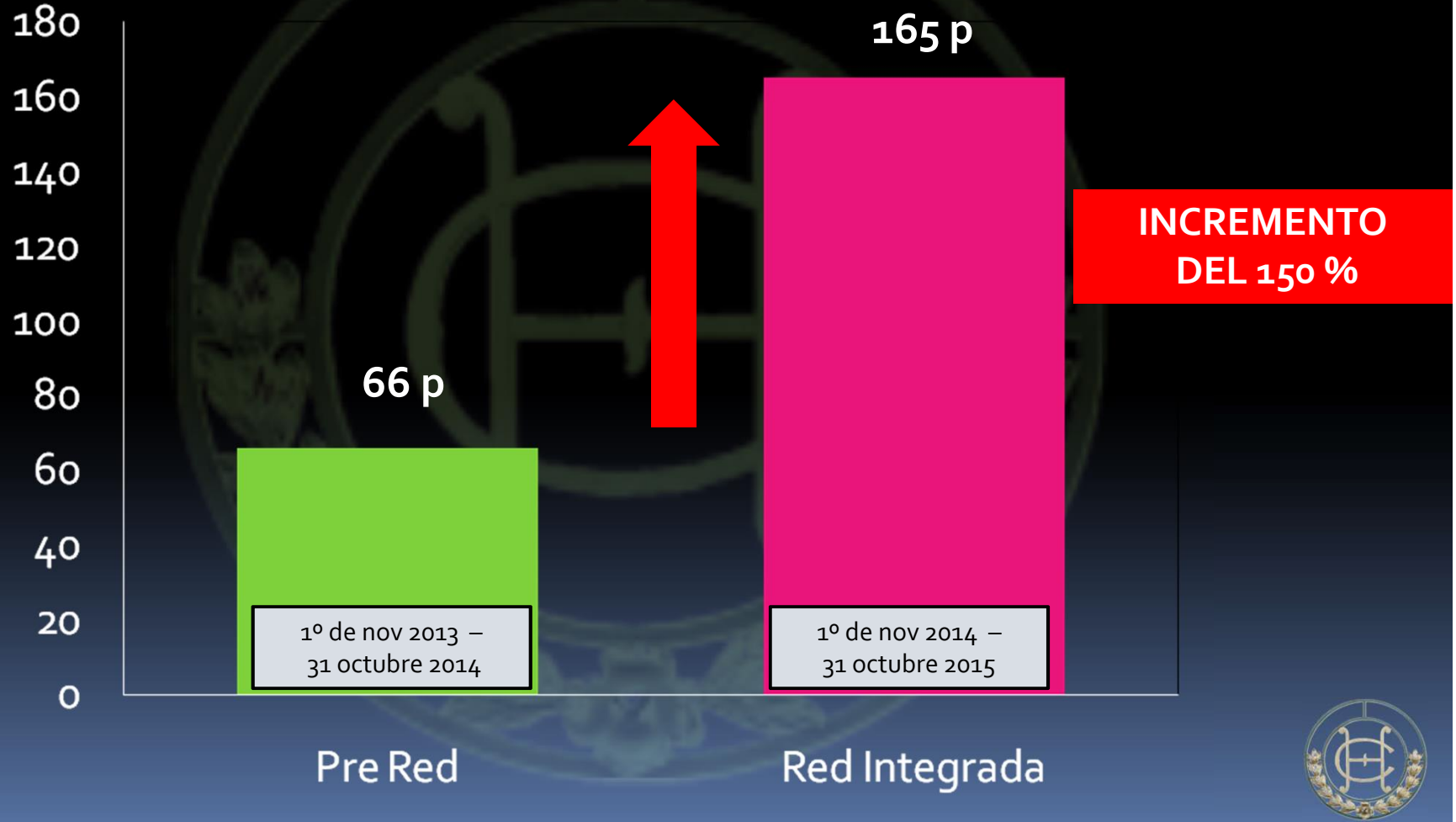
- La ciudad de Rosario tiene una superficie de 178 km2. Según datos del Instituto Provincial de Estadísticas y Censo (IPEC), el aglomerado Rosario tiene una población de 1.268.294, y de ellos, cerca de 400.000 (+ del 30%) no posee cobertura social. (año 2015)

HOSPITALES PUBLICOS DE ROSARIO

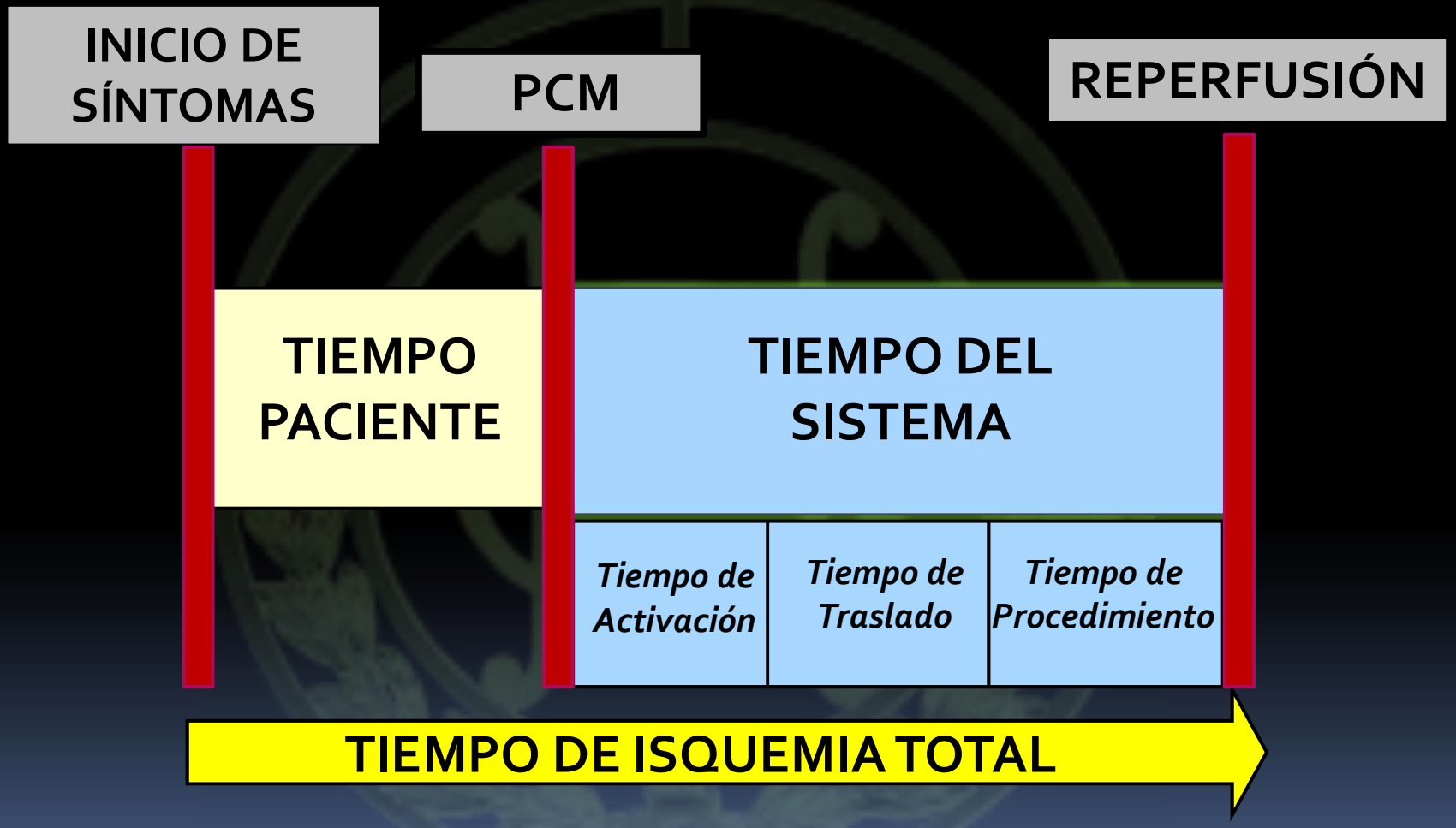


RESULTADOS

Nº de pacientes con IAMCEST tratados con ICPP

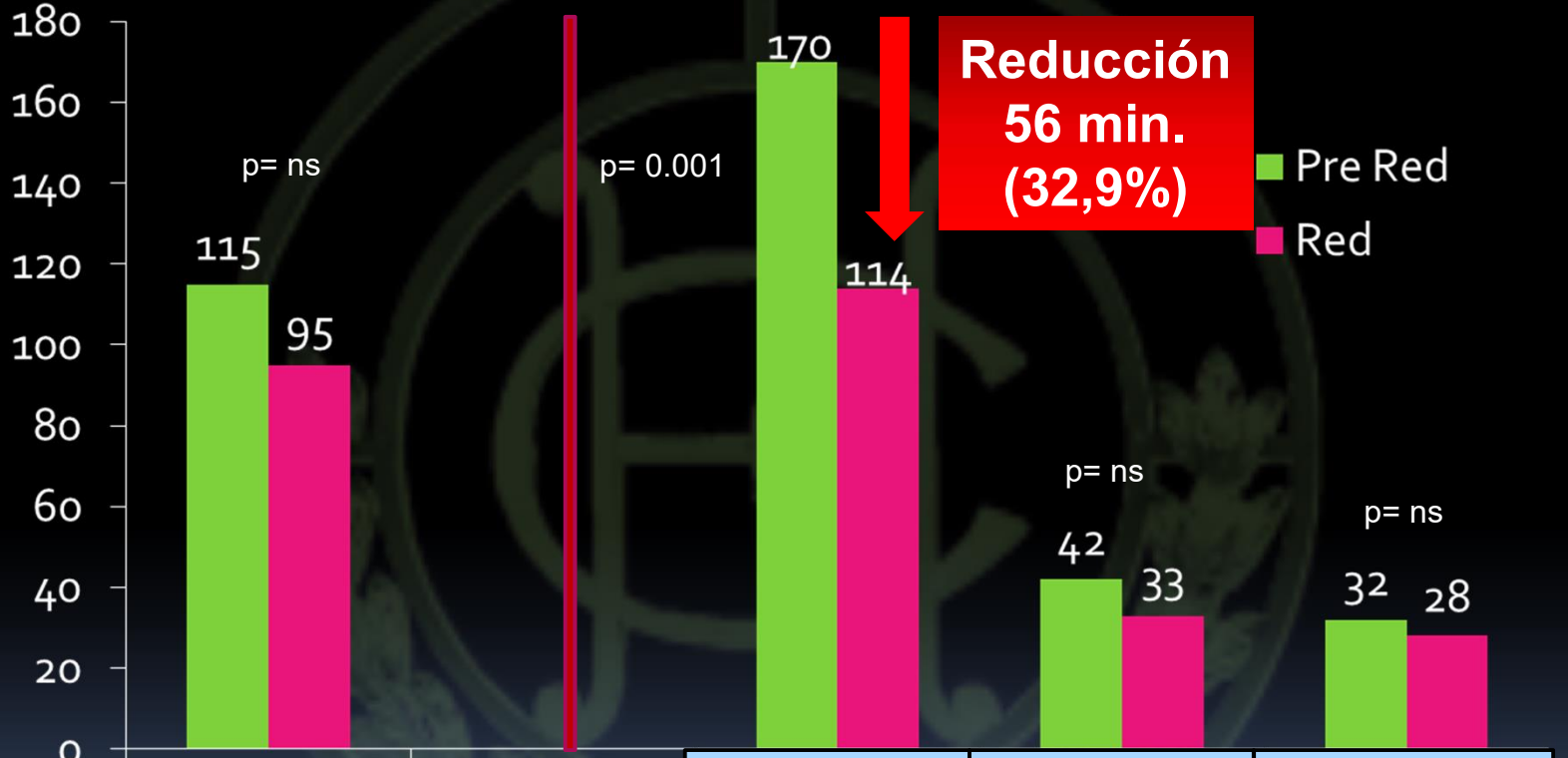


TIEMPOS DE ACTUACIÓN



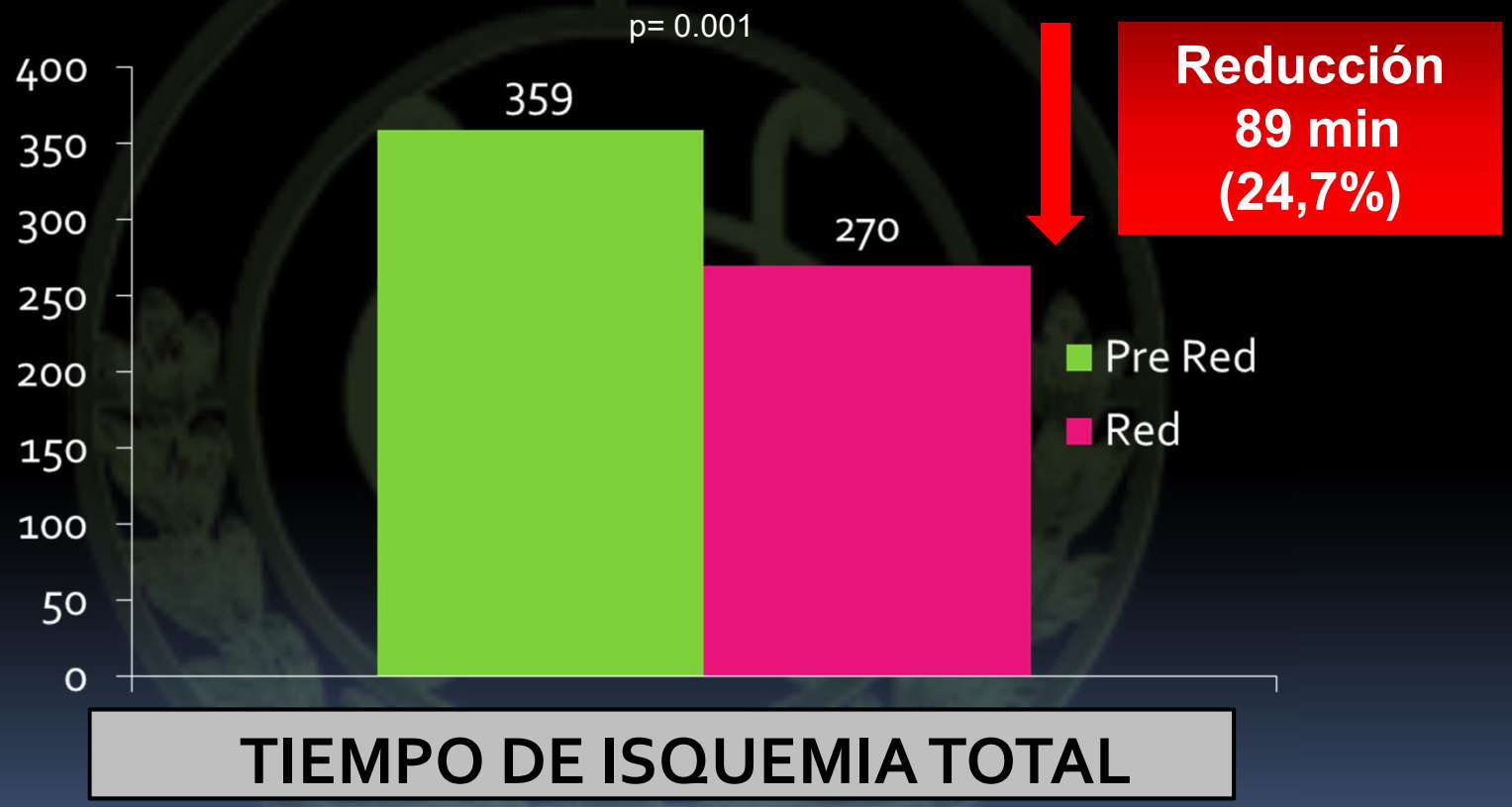
Tiempo de activación: desde el 1º Contacto Médico y el llamado a Hemodinamia. Tiempo de traslado: desde el llamado a Hemodinamia hasta el ingreso del p. a sala de Hemodinamia. Tiempo de Procedimiento: desde la llegada del p. a sala de Hemodinamia hasta el pasaje de la cuerda. Los tiempos se calcularon en medianas y se compararon mediante la prueba de rangos de Mann-Whitney.

TIEMPOS DE ACTUACIÓN



RESULTADOS

TIEMPOS DE ISQUEMIA TOTAL



Propuesta de GITMUPRO-IAM

El I.A.M. debe ser considerado una **EMERGENCIA DE SALUD PUBLICA** tanto en:

- Información (pacientes)
- Formación de redes (trabajo en equipo)
- Diagnóstico precoz (P.C.M.)
- Traslado de pacientes (S.E.M.)
- Manejo intrahospitalario (ICPp o TBL)

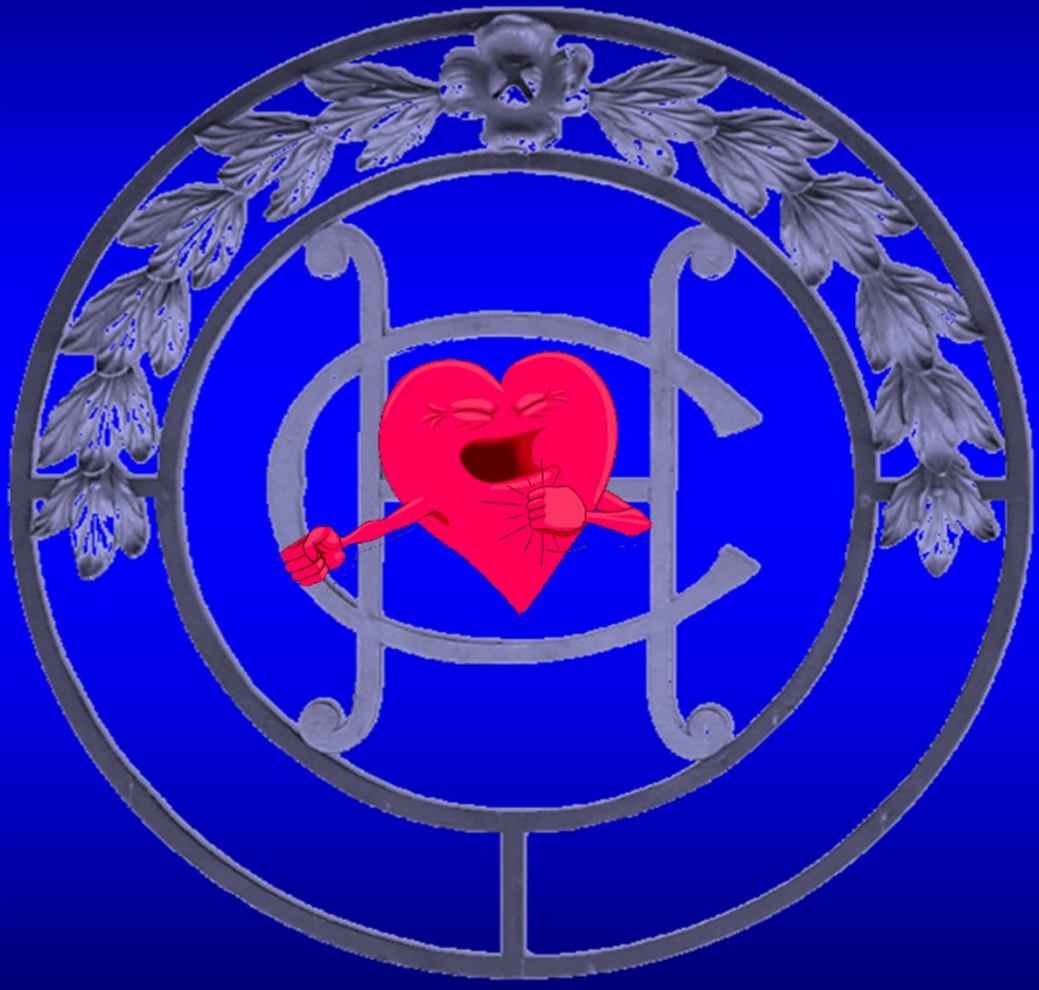
Mensajes para llevar a casa

Tiempo es músculo

Diagnóstico precoz y derivación inmediata para reperfusión (sea cual fuera) “salva vidas”

Esto se podrá lograr de manera efectiva con trabajo en equipo y fuerte apoyo en la toma de decisiones por parte de las autoridades de Salud Pública

Muchas Gracias por su Atención



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