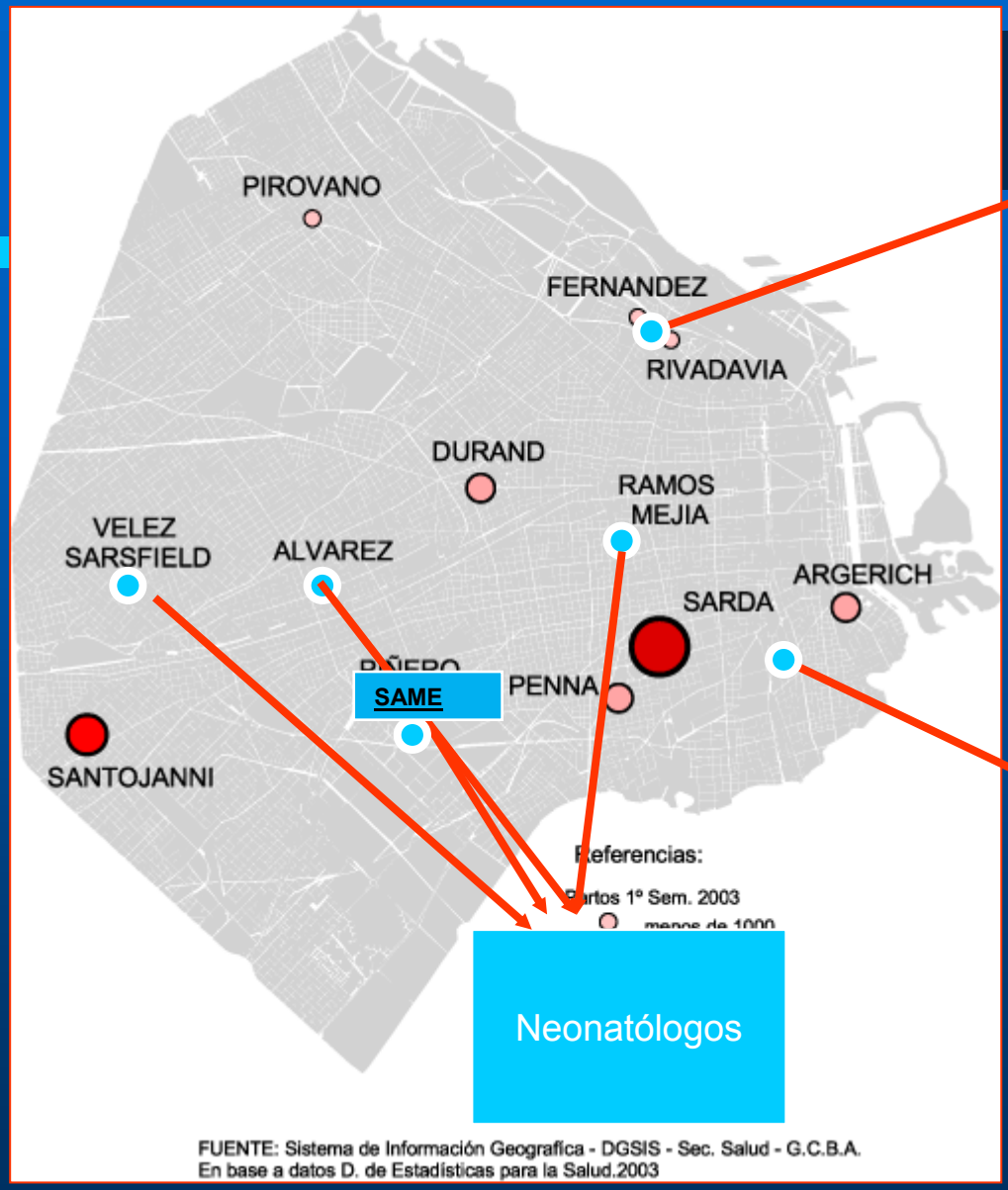
Traslado del paciente críticamente enfermo

Dra. Gladys Saá

EXPERIENCIA DEL GRUPO SAME EN TRASLADO DE NEONATOS CRITICAMENTE ENFERMOS

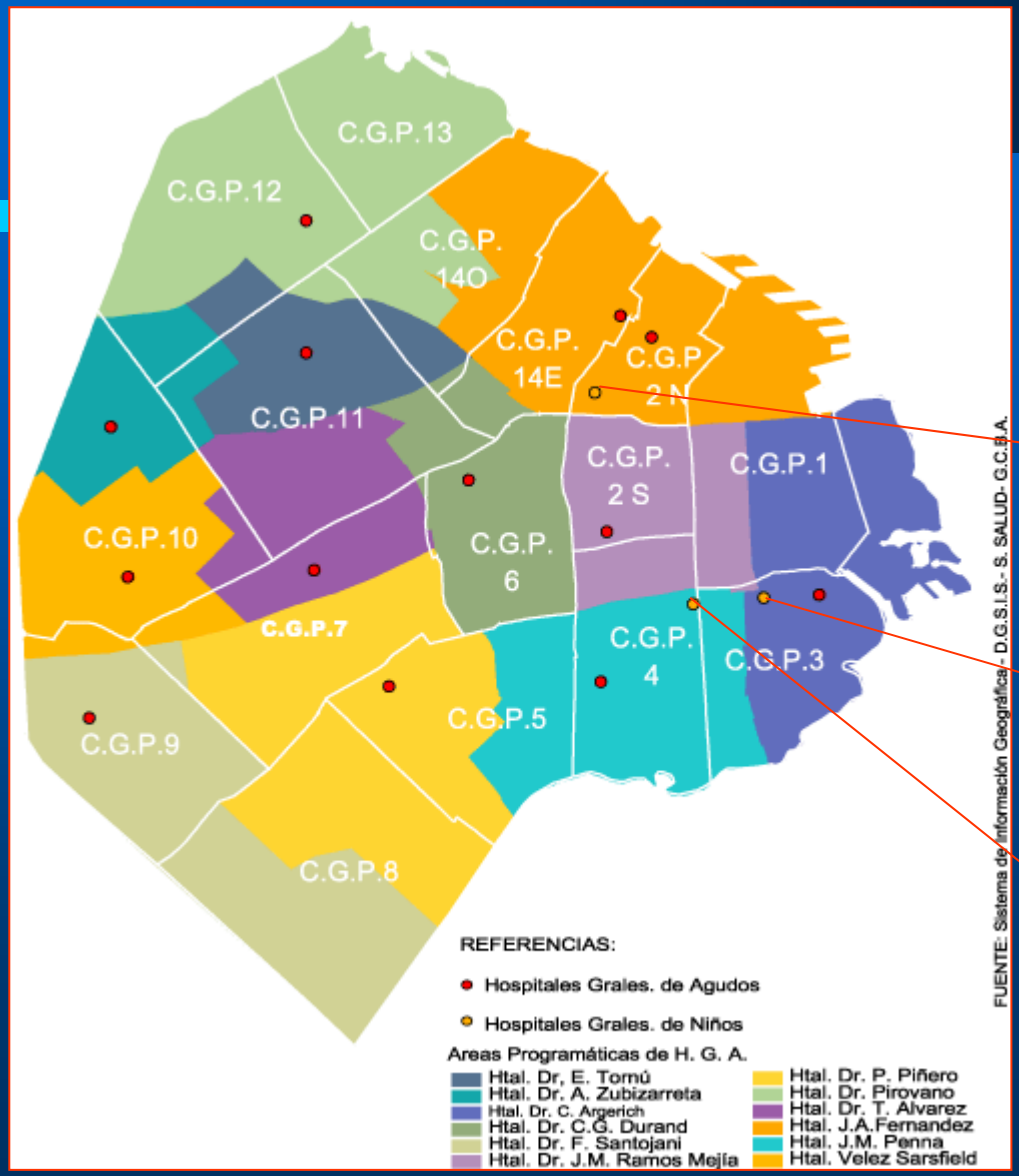
2005-2010


Gata



Enfermero

Móvil



Htal Gutierrez

Htal Elizalde

Htal Garrahan

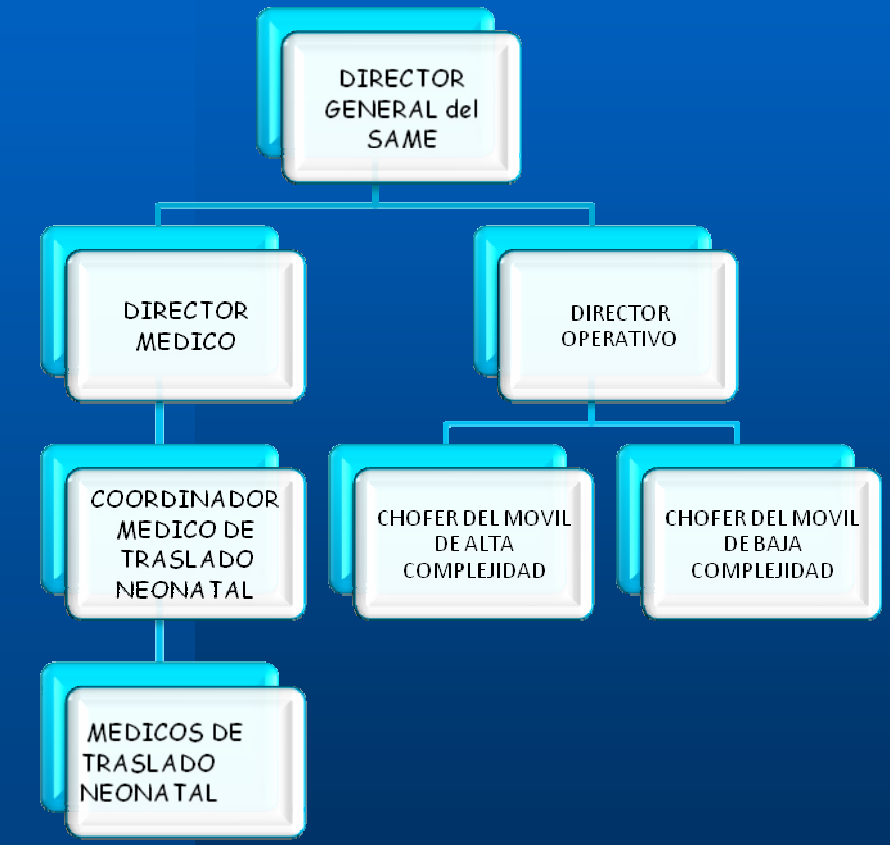
Visión:

- Ningún recién nacido en la Ciudad Autónoma de Buenos Aires se verá privado del acceso equitativo a la atención médica de alta complejidad o a cualquier asistencia que requiera para la preservación de su integridad física, sicológica y social.

Misión:

- Trasladar todos los recién nacidos de la Ciudad Autónoma de Buenos Aires, que requieran tratamiento, estudios ó acciones relacionadas con su salud, especialmente los neonatos que se traten en centros de menor complejidad en los cuales no se pueda ofrecer atención de alta complejidad. Para ello se garantizará la atención los 365 días del año durante las 24 horas, por personal altamente calificado y entrenado en traslados neonatales de diversa complejidad.
- Se ofrecerá para ello, una línea telefónica las 24 horas, atendida por los neonatólogos que brindará además, asesoramiento y nexo entre los hospitales de baja complejidad y los de alta complejidad, de la Ciudad Autónoma de Buenos Aires y DE TODO EL PAIS. Ayudando a establecer estrategias de tratamiento que impliquen ó no el traslado. OFRECIENDO POR LO TANTO UN ASESORAMIENTO CON ALCANCE NACIONAL.

Estructura

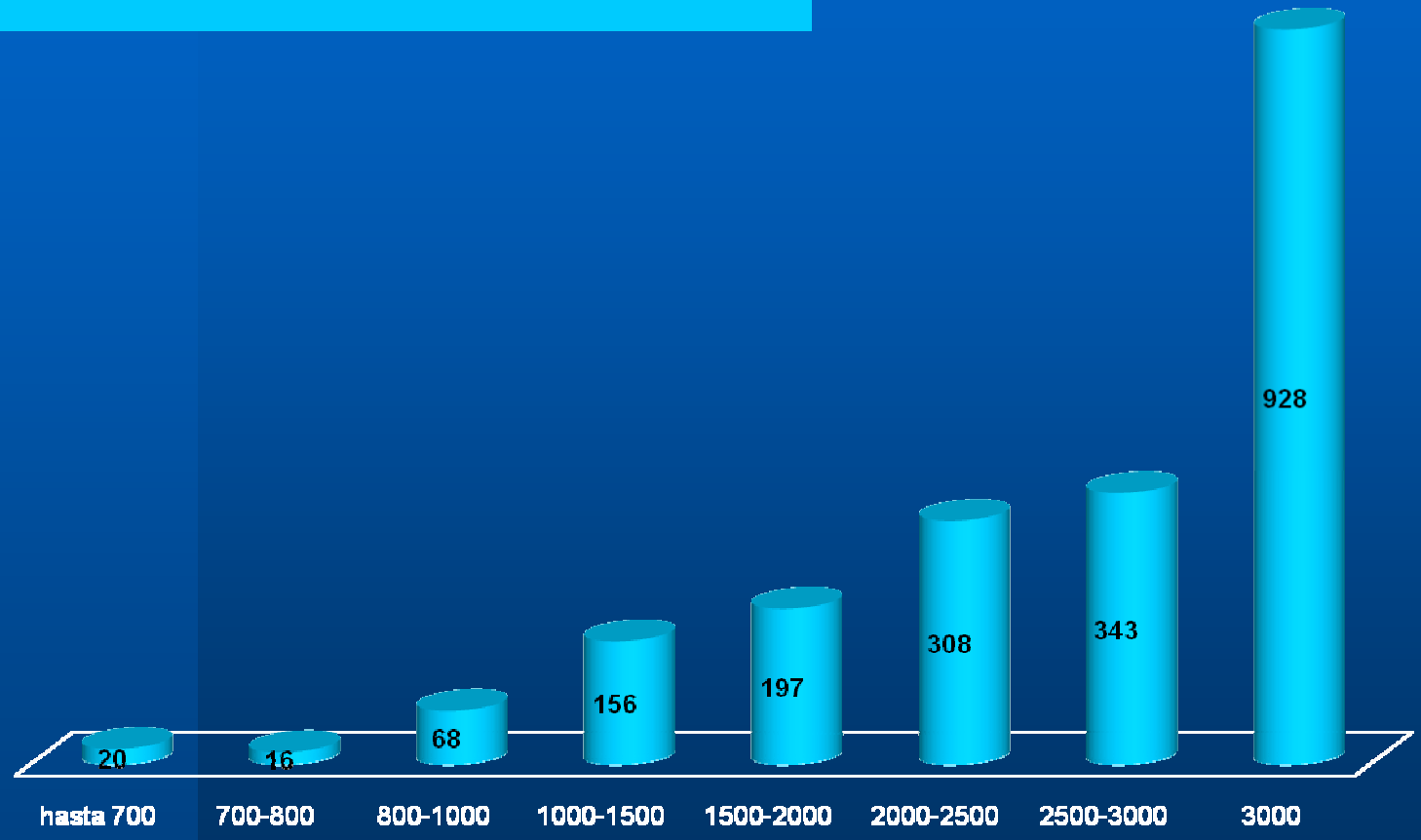

DIRECTOR GENERAL del SAME
DIRECTOR MEDICO
DIRECTOR OPERATIVO
COORDINADOR MEDICO DE TRASLADO NEONATAL
CHOFER DEL MOVIL DE ALTA COMPLEJIDAD
CHOFER DEL MOVIL DE BAJA COMPLEJIDAD
MEDICOS DE TRASLADO NEONATAL


DIRECCION GRAL DE ENFERMERIA
Enfermero Neonatal

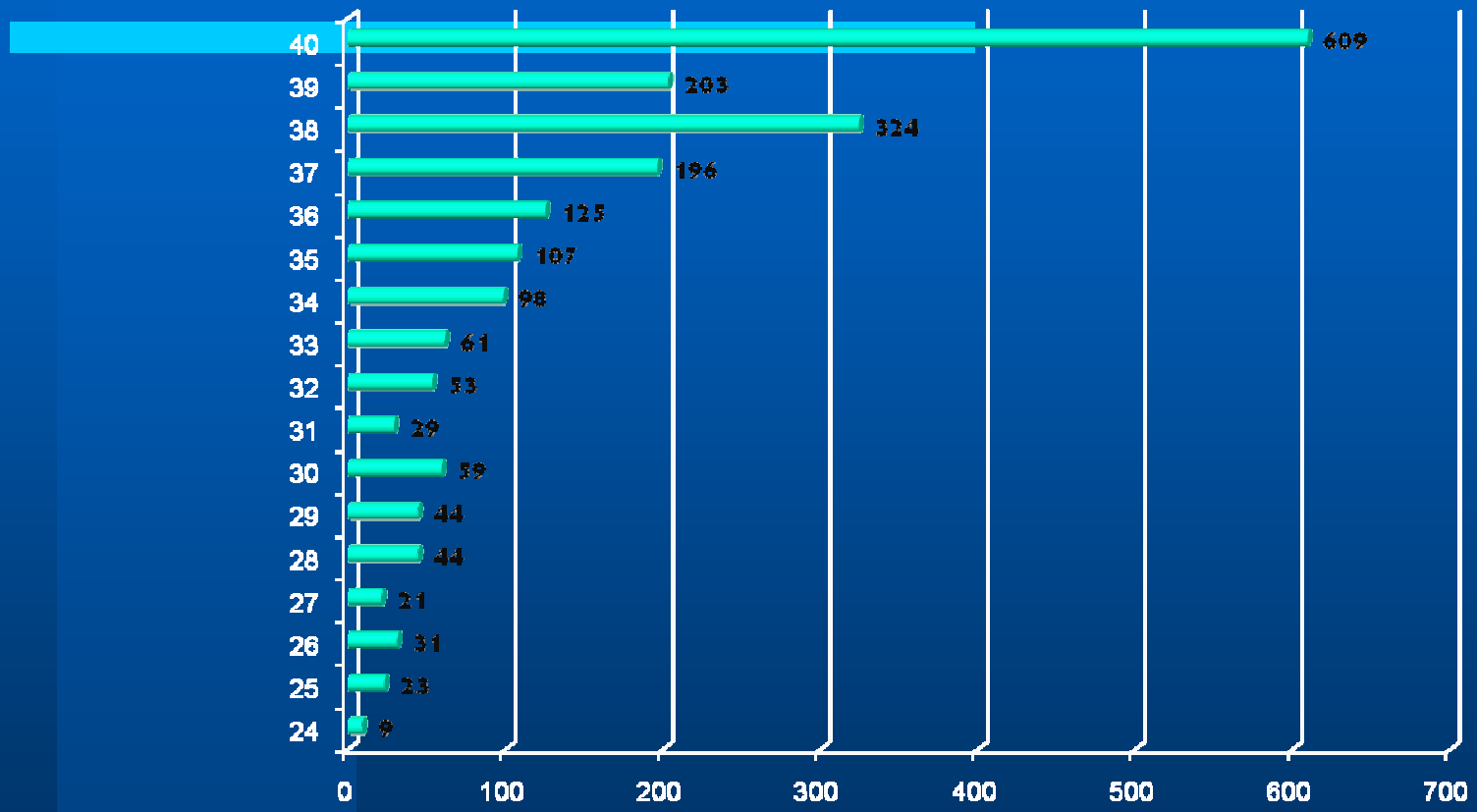
Traslado Neonatal SAME

Total de traslados 2005 -2010: 2036

Distribución por peso
n:2036



Distribución por edad gestacional
n:2036



Probability of IVH for transported infants
(transport ——— , no transport ---)

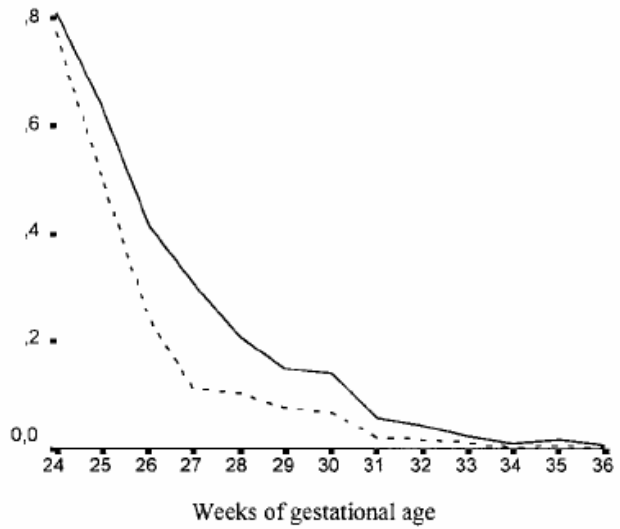


Figure 1. Mean predicted probabilities of IVH in the full logistic-regression model with risk of transport to another hospital and with no risk of transport. The variable gestational age was categorized by weeks.

J. Perinat. Med.
28 (2000) 104–110

Risk factors for intraventricular hemorrhage in a birth cohort of 3721 premature infants

Michael Gleißner, Gerhard Jorch, and Stefan Avenarius

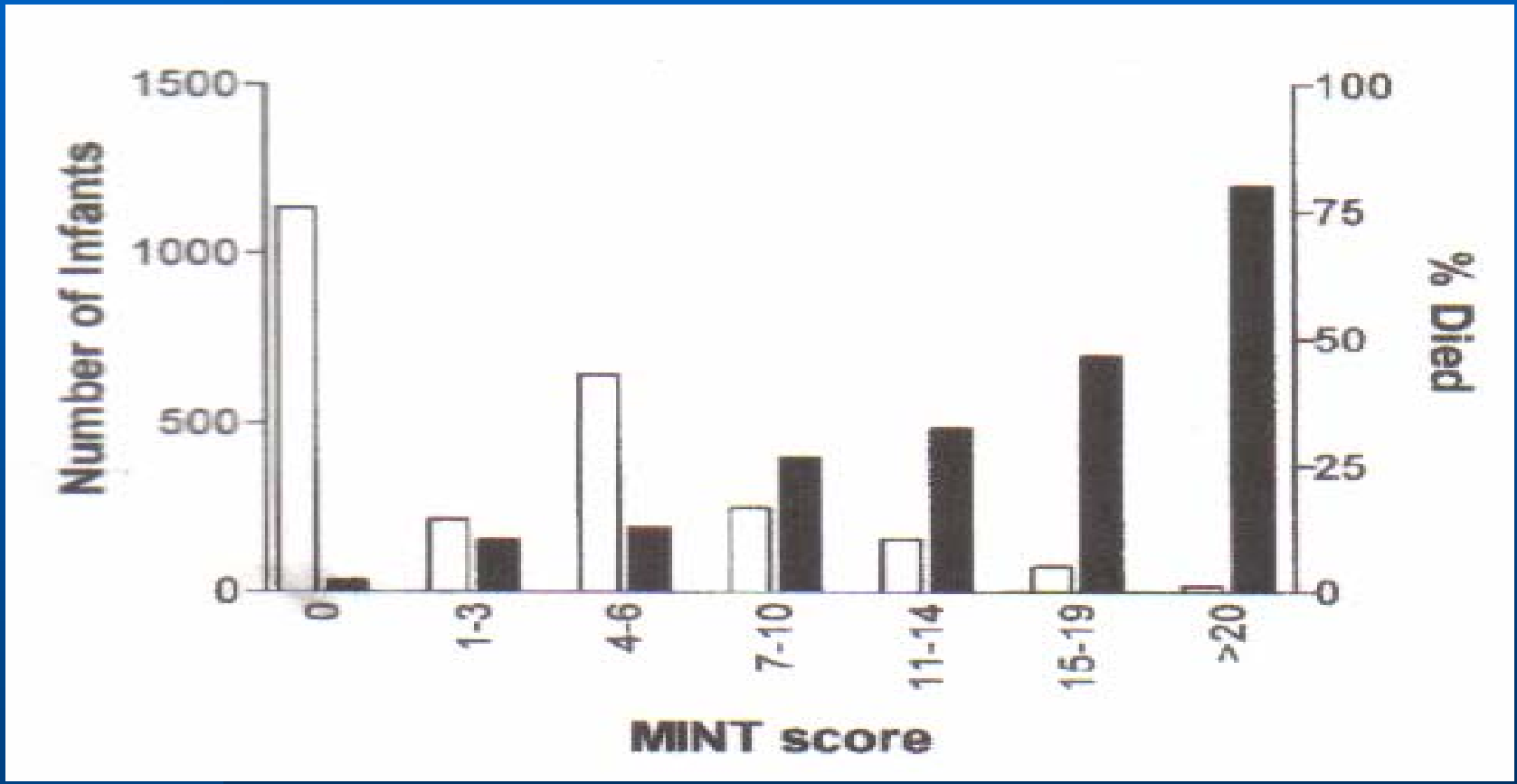
Zentrum für Kinderheilkunde, Otto-von-Guericke Universität Magdeburg, Germany

MINT: Mortality Index for Neonatal Transportation Score
Pediatrics Nov 2004; 114;424-428

TABLE 4. MINT Score Point Allocation

	% Died	Points
pH		
<6.9	59.52	10
6.91–7.1	23.78	4
>7.1	10.36	0
Age		
0–1 h	25.16	4
>1 h	10.24	0
Apgar score at 1 min		
0	44.44	8
1	30.10	5
2	22.11	2
3	18.50	2
>3	7.49	0
Birth weight		
<750 g	62.50	5
751–1000 g	36.00	2
1001–1500 g	19.05	1
>1500 g	10.74	0
Pao_2		
≤3 kPa	28.57	2
>3 kPa	11.87	0
Congenital abnormality		
Yes	22.27	5
No	9.55	0
Intubated at time of call		
Yes	26.20	6
No	10.04	0
Maximum		40

MINT: Mortality Index for Neonatal Transportation Score
Pediatrics Nov 2004; 114;424-428



The Effect of Transport on the Rate of Severe Intraventricular Hemorrhage in Very Low Birth Weight Infants

CRAIG V. TOWERS, MD, ROBERT BONEBRAKE, MD, GUADALUPE PADILLA, MD, AND PAMELA RUMNEY, RNC

Table 1. Outborn and Inborn Neonates for the Total Study Population

	Inborn	Outborn	*P*
No. of neonates	285	44	
Mean birth weight (g)	897 ± 187	940 ± 155	.14
Mean gestational age at delivery (wk)	27.1 ± 2.0	27.5 ± 1.8	.28
5-min Apgar <7	73 (26%)	13 (30%)	.71
5-min Apgar ≤3	13 (5%)	2 (5%)	.68
Incidence of hyaline membrane disease	148 (52%)	29 (66%)	.12
No. of newborns treated with rescue surfactant	127 (45%)	27 (61%)	.06
Number of newborns treated with indomethacin	154 (54%)	31 (70%)	.06
Grade III or IV intraventricular hemorrhage	27 (9%)	10 (23%)	<.02
Incidence of neonatal death	15%	23%	.26
Neonatal mortality rate	151/1000	233/1000	

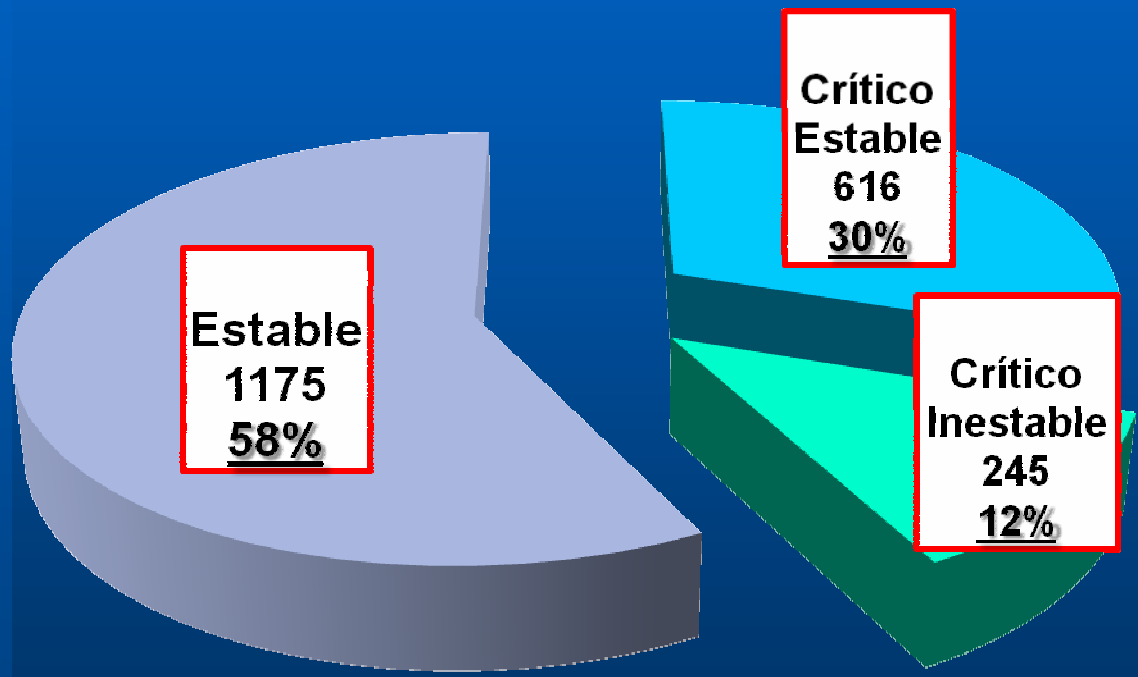
Distribución por motivo de traslado en RNPT n:721

MOTIVO	n
LUGAR	136
INTERCONSULTAS	82
ESTUDIO	72
ALTA COMPLEJIDAD	70
ROP	61
NEC	50
CARDIOQUIRURGICO	49
GASTROSQUISIS	42
BQL	35
NQ-MMC	35
ENDOSCOPIA	27
ATRESIA DE ESOFAGO	18
NQ-HIDROCEFALIA	14
ANO IMPERFORADO	8
HERNIA DIAFRAGMATICA	8
ONFALOCELE	8
ATRESIA INTESTINAL	6
TOTAL	721

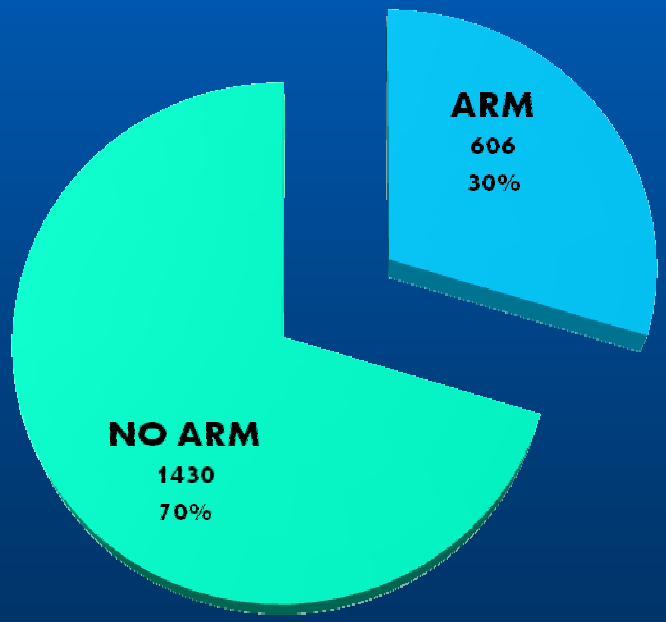
Distribución por motivo de traslado en RNT n: 1315

MOTIVO	n
CARDIOQUIRURGICO	291
GASTROSQUISIS	179
T--ESTUDIO	126
T-LUGAR	125
T-INTERCONSULTA	123
T-NQ	86
ALTA COMPLEJIDAD	72
ANO IMPERFORADO	40
T-ENDOSCOPIA	34
BRONQUIOLITIS	32
COMPLEJIDAD	32
MMC	32
ATRESIA ESOFAGO	30
HERNIA DIAGRAGMATICA	29
ATRESIA INTESTINAL	26
OBSTRUCCION INTESTINAL	22
ONFALOCELE	22
SD PILORICO	22
OTROS	16
ATRESIA DUODENAL	11
TQT	11
TOTAL	1315

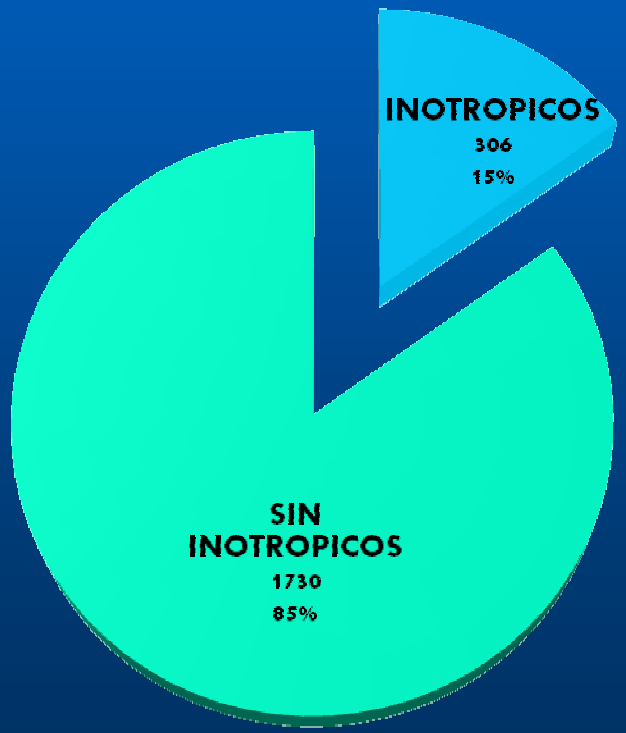
Condiciones clínicas
n:2036



Pacientes ventilados
n: 2036



Pacientes con inotrópicos
n:2036



- Se realizaron entre 2005 -2010: 2.036 traslados
- Con Cardiopatías Congénitas : 340 neonatos (17 %) = RNT 291 + RNPT 49
- No falleció durante el traslado ningún paciente
- Rango de tiempo de traslado 30-60 minutos

RNT –CQ n: 291

Tipo	n	%
TGV	38	13
HIPOPLASIA VI	33	11
CC sin diagnóstico	29	10
COA	25	9
ATRVP	25	9
AP	25	9
EP CRIT	14	
DAP	14	
VU	12	
CAVC	12	
FALLOT	11	
Insuficiencia Cardíaca	11	
EST Ao CRIT	8	
AT	8	
EBSTEIN	6	
CIV	6	
TRONCO	5	
ANILLO VASC	2	
MIXOMA	1	
MIOCAR	1	
INT ARCO AO	1	
HIPOPLASIA CAY AO	2	
DTSVD	1	
TOTAL	291	

61 %

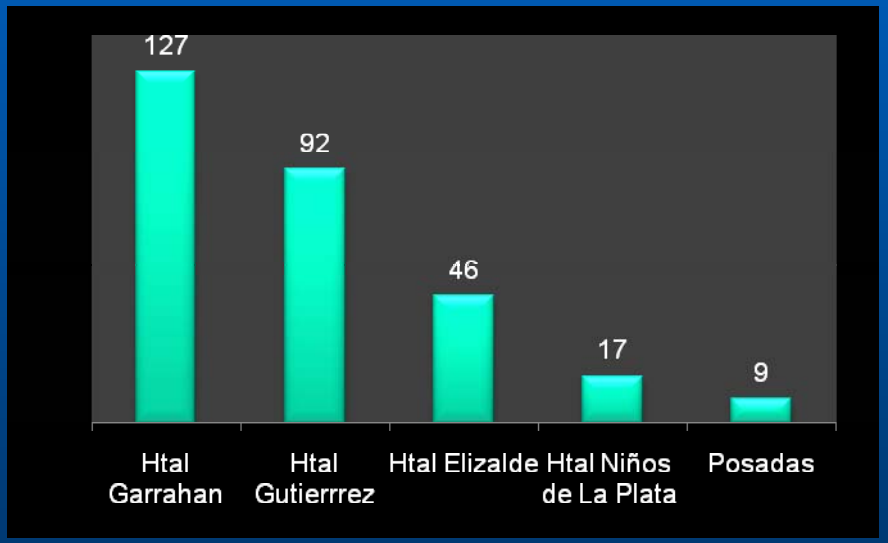


TABLE 1 **Summary of Data Collected**

Demographics	Diagnostic	Transport	Support	Metabolic Pretransport and Posttransport	Outcome
Weight	Prenatal diagnosis	Transport team origin	Umbilical arterial or venous access	Electrolytes	Time on ventilator
Gestational age	Pretransport diagnosis	Time of call	Vasopressor infusion	Hematocrit	Time to operation
Date of birth	Posttransport diagnosis	Time to arrival	Prostaglandin E1 infusion	Hemoglobin	Time in ICU
Time of birth		In-transport events	Ventilatory support and settings	Arterial blood gases	Time in hospital
		Time of ICU arrival		Glucose (posttransport only)	Death
				Vital signs	
				SUN	
				Creatinine	
				Saturation	

SUN indicates serum urea nitrogen.

Pretransport and Posttransport Characteristics and Outcomes of Neonates Who Were Admitted to a Cardiac Intensive Care Unit

Scott B.

PEDIATRICS Vol. 118 No. 3 September 2006, pp. 1070-1077

TABLE 2 **Major Diagnoses**

Diagnosis	Local	Transport	Total
TGA (±VSD)	8	39	47
HLHS	19	9	28
COA	6	15	21
PA with IVS	5	6	11
IAA	3	6	9
TOF	2	7	9
Single left ventricle	6	1	7
TOF with PA	5	2	7
AS	2	4	6
Truncus arteriosus	0	5	5
PS	1	4	5
TAPVR	0	4	4
Single right ventricle (not HLHS)	3	1	4
TA	1	3	4
Heterotaxy syndromes	3	0	3
Other	6	16	22
Total	70	122	192

TGA indicates transposition of the great arteries; VSD, ventricular septal defect; HLHS, hypoplastic left heart syndrome; COA, coarctation of the aorta; PA, pulmonary atresia; IVS, intact ventricular septum; IAA, interrupted aortic arch; TOF, tetralogy of Fallot; AS, aortic stenosis; PS, pulmonary stenosis; TAPVR, totally anomalous pulmonary venous return; TA, tricuspid atresia.

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TABLE 3 Patient Characteristics

	Local	Transport	*P*
N	70	122	
Weight, kg	2.91 ± 0.6	3.25 ± 0.8	.006
Gestational age, wk	37.2 ± 2.6	38.4 ± 2.6	<.001
Age at admission, d	1.3 ± 1.1 (1–9)	6.0 ± 6.3 (1–28)	<.001
Prenatal diagnosis, *n* (%)	63 (90)	8 (7)	<.001
RACHS-1 score	4.04 ± 1.46	3.47 ± 1.09	<.001
PGE1, *n* (%)	44 (63)	77 (63)	NS
Intubation, *n* (%)	16 (23)	66 (54)	.013
Vasopressor, *n* (%)	7 (9)	37 (30)	.004
Saturation, %	80.7 ± 18.6	83.8 ± 15.1	NS
Temperature, ° C	36.6 ± 1.2	36.9 ± 1	.NS
pH	7.32 ± 0.10	7.39 ± 0.1	<.001
Glucose, mg/dL	152 ± 110	116 ± 66	.023
Sodium, mEq/L	136 ± 3.4	137 ± 4.0	.014
Potassium, mEq/L	4 ± 0.7	4 ± 0.9	NS
Chloride, mEq/L	102 ± 4	100 ± 10	NS
HCO_3, mEq/L	22 ± 3.2	24 ± 4.8	.02
SUN, mg/dL	10 ± 4.8	12.8 ± 8.6	.07
Creatinine, mg/dL	0.7 ± 0.2	0.6 ± 0.3	.004
Hemoglobin, g%	15.6 ± 2.4	14.5 ± 2.4	.006
Mean blood pressure, mm Hg	47 ± 13.3	52 ± 14	.005
Heart rate, beats per min	150 ± 20	160 ± 23	.002
Respiratory rate, breaths per min	42 ± 17	40 ± 20	NS
Age at operation, median (range), d	5 (1–42)	8 (0–43)	.002
ICU to operation, median (range), d	5 (1–42)	4 (0–40)	.04
Ventilator days, median (range)	8 (1–186)	6 (1–47)	NS
ICU days, median (range)	11 (2–239)	9 (1–45)	NS
Hospital days, median (range)	16 (2–247)	13 (2–69)	NS
Death, *n* (%)	10 (14)	6 (4.9)	.024

Data are mean ± SD except where noted. PGE1 indicates prostaglandin E1; SUN, serum urea nitrogen; NS, nonsignificant.

Pretransport and Posttransport Characteristics and Outcomes of Neonates Who Were Admitted to a Cardiac Intensive Care Unit

Scott B.

PEDIATRICS Vol. 118 No. 3 September 2006, pp. 1070-1077

TABLE 4 Patients Who Fell out of Range During Transport

	Pretransport	Posttransport	Diagnosis	Ventilator	Pressor	PGE1
pH	7.37	6.95	TGA/IVS[a]			[c]
	7.48	7.11	Myocarditis[b]	[c]	[c]	
	7.38	7.21	TGA/VSD			[c]
	7.41	7.23	TAC/IAA	[c]		
Temperature, ° C	36.6	32.9	VSD/PS	[c]	[c]	[c]
	37	33.4	TGA/IVS	[c]		[c]
	36.6	34.2	TGA/IVS	[c]		[c]
	36.9	35.5	PA/IVS	[c]		
Saturation, %	93	42	HLHS			[c]
	98	47	TAPVR			
	78	60	TGA/IVS	[c]		[c]
	87	66	PPHN	[c]		[c]
	70	66	TGA/IVS			
	80	68	PA/IVS	[c]		[c]
	83	68	TGA/IVS			[c]
SUN, mg/dL	27	31	IAA/VSD	[c]		[c]
	10	32	HLHS			[c]
	14	49	Myocarditis[b]	[c]	[c]	
Potassium, mEq/L	3.2	2.2	CAVC/COA			[c]
	4	2.5	TOF	[c]		[c]
	4.5	2.9	ASD/Scimitar	[c]		
	3.9	6.2	TGA/VSD			
HCO_3	20	6	TGA/IVS[a]			[c]

TGA indicates transposition of the great arteries; IVS, intact ventricular septum; VSD, ventricular septal defect; TAC, truncus arteriosus communis; IAA, interrupted aortic arch; VSD, ventricular septal defect; PS, pulmonary stenosis; PA, pulmonary atresia; HLHS, hypoplastic left heart syndrome; TAPVR, totally anomalous pulmonary venous return; PPHN, primary pulmonary hypertension of the newborn; COA, coarctation of the aorta; TOF, tetralogy of Fallot; ASD, atrial septal defect; Scimitar, scimitar syndrome; SUN, serum urea nitrogen.

[a,b] Same patient.

[c] Transport patient received ventilator support (Ventilator) or vasopressor support (Pressor) or was on a prostaglandin infusion (PGE1).

Pretransport and Posttransport Characteristics and Outcomes of Neonates Who Were Admitted to a Cardiac Intensive Care Unit

Scott B.

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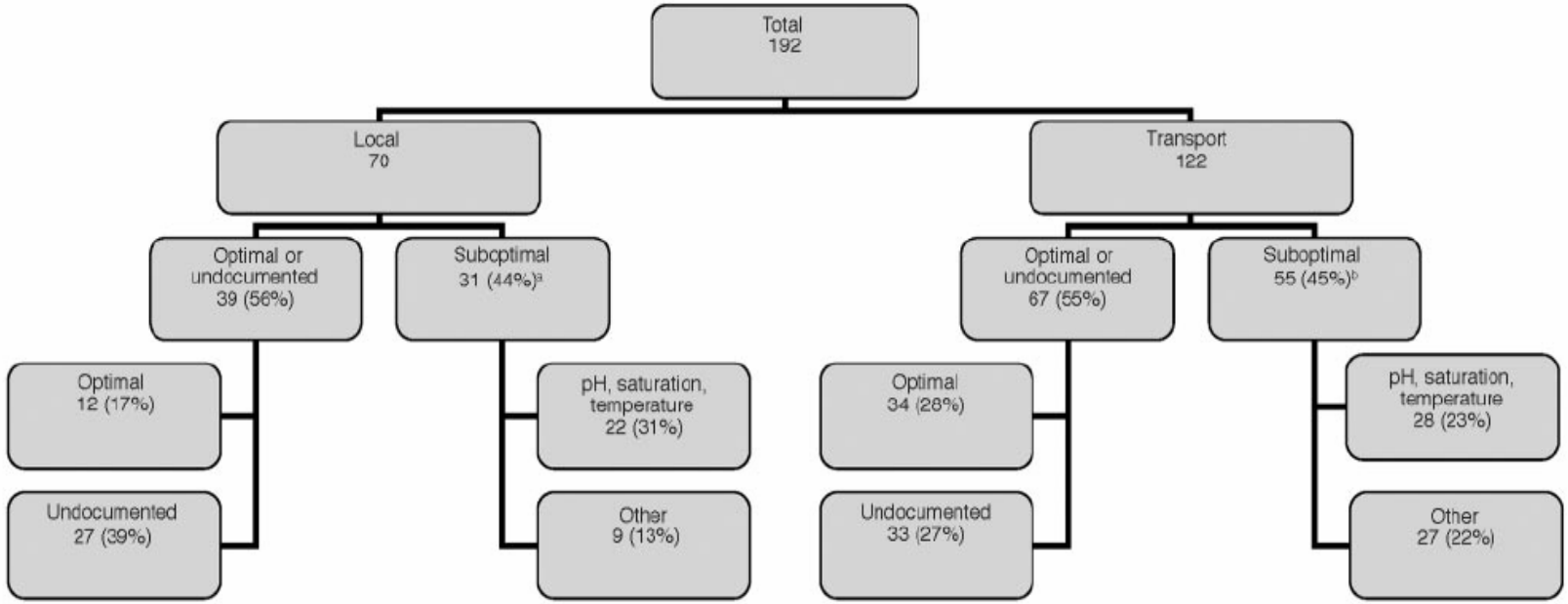

FIGURE 2

Admission status of the 192 admissions. Locally born and transported patients are characterized as those who were known to have at least 1 suboptimal admission characteristic versus those who were known to have all optimal values or undocumented values. Those with known suboptimal values are characterized further as patients with an abnormal pH, oxygen saturation, or core temperature versus those with some other abnormal admission value. Some patients in the suboptimal category also had undocumented values.

Pretransport and Posttransport Characteristics and Outcomes of Neonates Who Were Admitted to a Cardiac Intensive Care Unit

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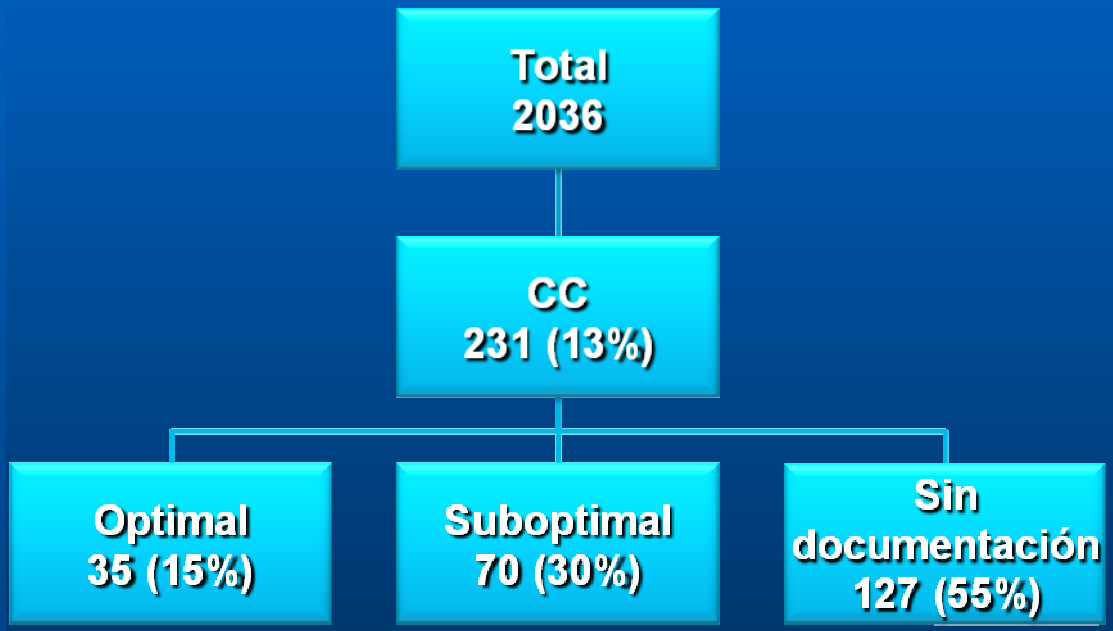
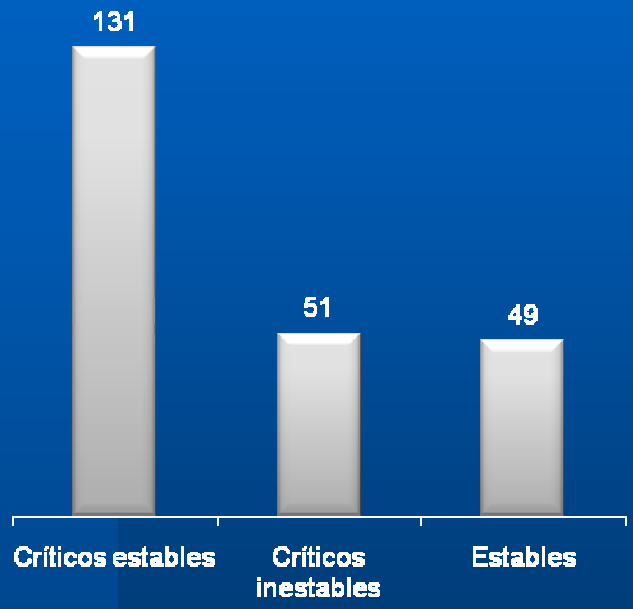
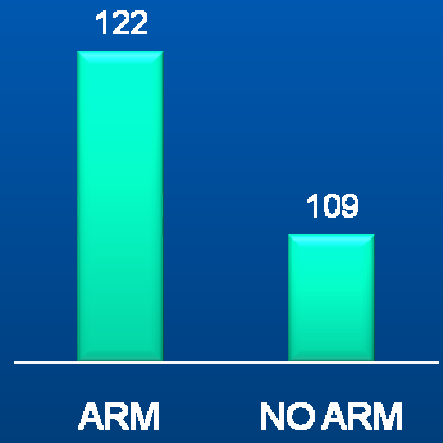
Traslados SAME 2005-2010



n=231


131
51
49
Críticos estables
Críticos inestables
Estables


122
109
ARM
NO ARM

Transporting newborn infants with suspected duct dependent congenital heart disease on low-dose prostaglandin E1 without routine mechanical ventilation

Kathryn A Browning **Carmo**,
Arch Dis Child Fetal Neonatal Ed 2007;92:F117–F119.

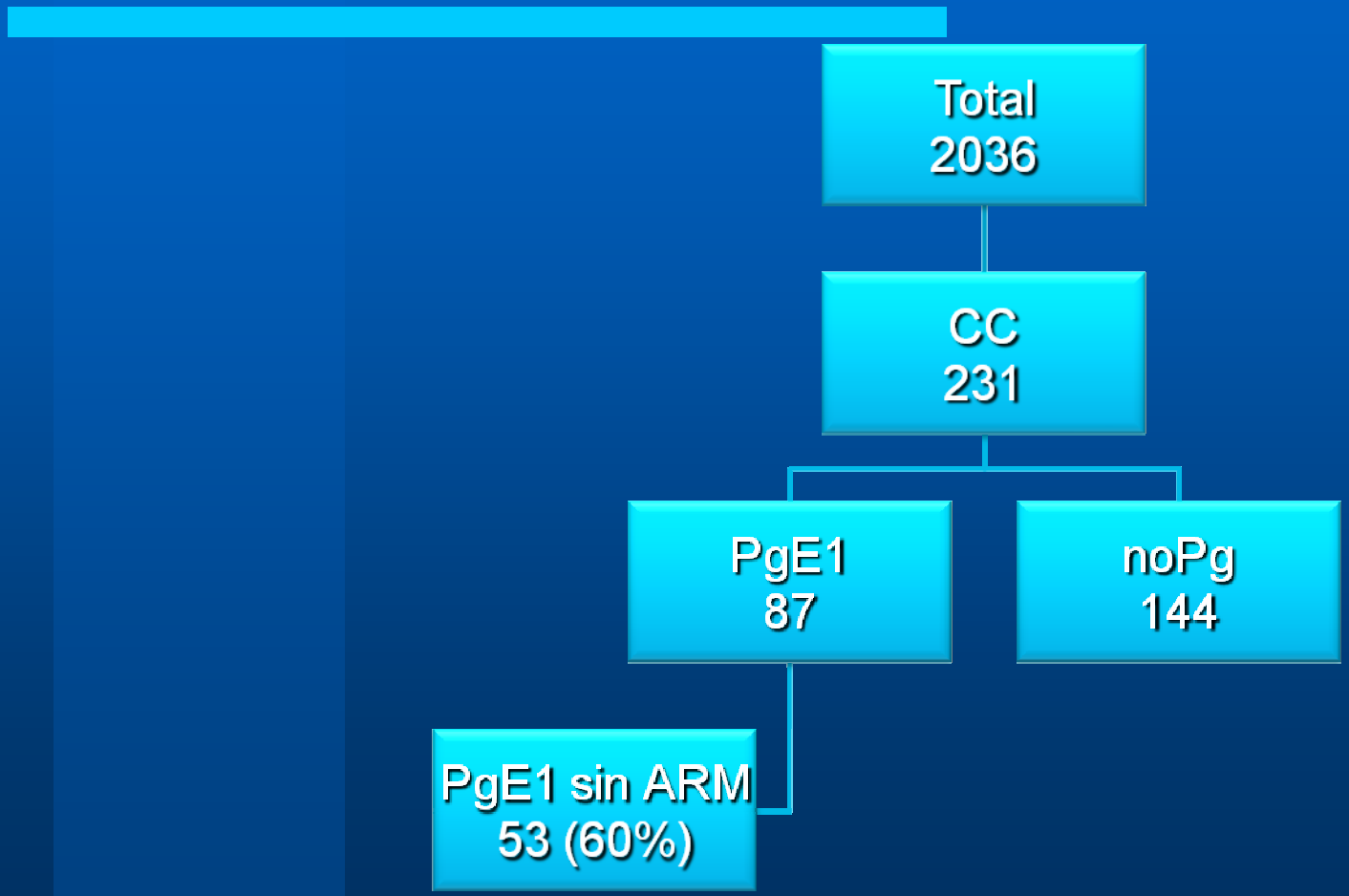
To evaluate the safety of transporting newborn infants with suspected duct dependent congenital heart disease (CHD) treated with prostaglandin E1 (PGE1) without routine mechanical ventilation.

Methods: A retrospective population-based audit of newborn infants with suspected CHD transported on PGE1 by the New South Wales newborn and paediatric Transport Service from 1995 through 2005.

Results: Mechanical ventilation was not used prior to treatment with PGE1 in 94 (31%) of the 300 infants. The indications for mechanical ventilation in the remaining 206 infants (69%) included elective mechanical ventilation because of the intention to use PGE1 (n = 125) and severe hypoxaemia, acidosis or cardiorespiratory failure prior to commencing PGE1 (n = 81). 16 (17%) of the 94 infants (31%) who were not ventilated initially required mechanical ventilation before transport because of apnoea, which developed within one hour of commencing PGE1. 2 (2.6%) of the 78 infants transported without mechanical ventilation developed apnoea in transit and both were receiving >15 ng/kg/min of PGE1. Apnoea was more likely to occur in non-ventilated infants when the PGE1 infusion rate was >15 ng/kg/min compared with ,15 ng/kg/min (14/33 vs 4/61, x2 = 15.55, p,.001).

Conclusions: Newborn infants with suspected duct dependent CHD treated with low dose PGE1 (15 ng/kg/min) may not require mechanical ventilation for safe transport.

Traslados SAME 2005-2010



Detection of Transposition of the Great Arteries in Fetuses Reduces Neonatal Morbidity and Mortality

Damien Bonnet, MD; Anna Coltri, MD; Laurent

Circulation. 1999;99:916-918

Comparison of Characteristics of Patients in the Prenatal and Postnatal Groups

	Postnatal Group	Prenatal Group	*P*
Isolated TGA	204	57	NS
Associated defects	46	11	NS
VSD	31	8	NS
VSD+CoA	14	3	NS
CoA	1	1	NS
Age at admission, h	73±210	2.2±2.8	<0.01
Mechanical ventilation	95 (38)	12 (17.6)	<0.01
Metabolic acidosis±MOF	56	8	<0.05
PGE_1 infusion	95	32	NS
BAS	168	54	NS
Preoperative mortality	15	0	<0.05
Coronary artery pattern	233 ASO	68 ASO	
Normal	168	47	NS
Abnormal	65	21	NS
Postoperative mortality	20	0	<0.01
Hospital stay, d	30±17	24±11	<0.01

VSD indicates ventricular septal defect; CoA, coarctation; MOF, multiorgan failure; PGE_1, prostaglandin E_1; BAS, balloon atrioseptotomy; and ASO, arterial switch operation. Values are n (%).

Improved Surgical Outcome After Fetal Diagnosis of Hypoplastic Left Heart Syndrome

Wayne Tworetzky, MD; Doff B. McElhinney, MD; V. Mohan Reddy, MD; Michael M.
Frank L. Hanley, MD; Norman H. Silverman, MD

Circulation 2001;103;1269-1273

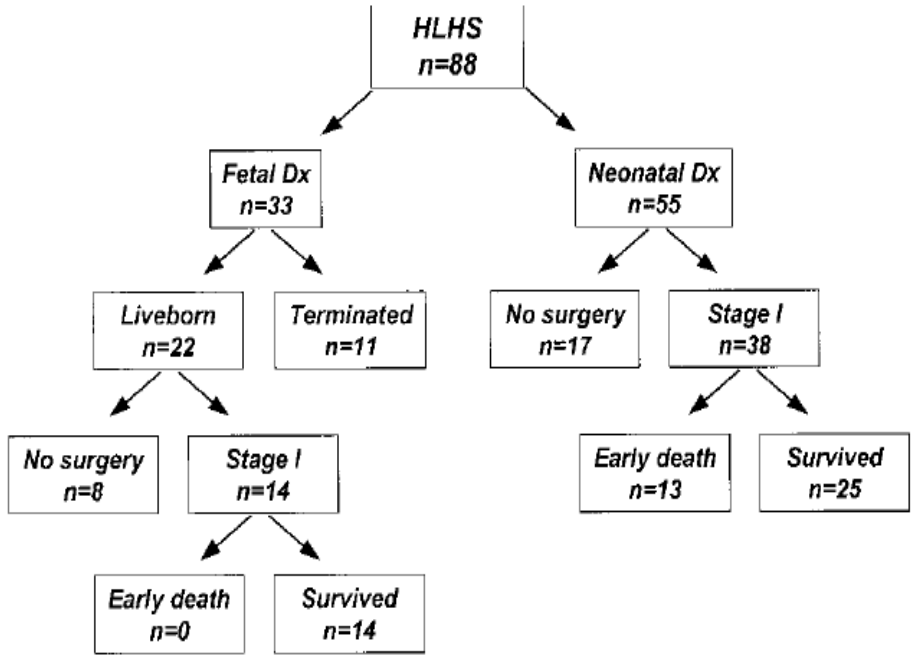


Figure 1. Flow diagram depicting outcomes of patients with prenatal or postnatal diagnosis (Dx) of HLHS.

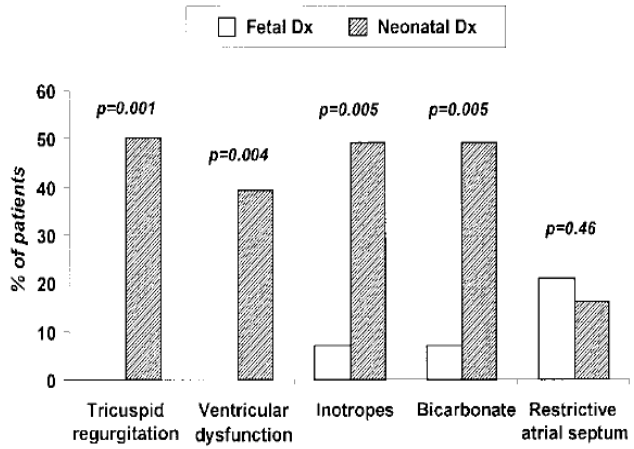
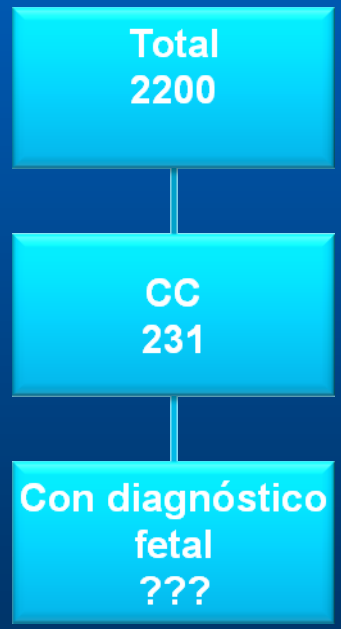


Figure 4. Percentage of prenatally and postnatally diagnosed (Dx) patients who were found to have tricuspid regurgitation of mild or greater degree, right ventricular dysfunction, or a significantly (needing intervention) restrictive interatrial septum on first postnatal echocardiogram and who needed preoperative bicarbonate or inotropic medications.

Traslados SAME 2005-2010



Auditoría Calidad de Traslado-Test de Hermansen

	0	1	2	Antes	Después
Glucemia	<25	25-40 ó >175	41-175		
TA sistòlica (mmHg) > 37s T	<30	30-39	>39		
TA sistólica (mmHg) < 37s PT	< Edad gestacional en semanas	Edad gestacional en samanas	>Edad gestacional en semanas		
PH	>7,20 ó > 7,50	7,20-7,29 ó 7,46-7,50	7,30-7,45		
PaO2 (mmHg)	<40	40-49 ó > 100	50-100		
Temperatura (ºC)	<36,1 ó > 37,7	36.1-36,5 ó 37,3-37,6	36,6-37,2		

“En neonatos críticos inestables, el traslado empeora su condición clínica previa, su realización implica riesgo y morbimortalidad”

SAME- 1er Congreso Argentino de Neonatología -2010

SAME-Fortalezas y debilidades-FODA

- **Fortalezas: desarrollo de un equipo de trabajo, protocolización de las patologías más frecuentes, interconexión entre servicios**
- **Amenaza: insuficiente reconocimiento del rol fundamental del traslado neonatal en la disminución de la morbimortalidad**
- **Debilidades: la falta de inserción en la estructura institucional del SAME, no contar con sede única que concentre en un solo lugar todo el plantel**
- **Oportunidad: integración a la atención perinatal a través de consensos en la ciudad de Buenos Aires**

Muchas gracias!!!!!