Pan American Health Organization

World Health Organization

REGIONAL OFFICE FOR THE Americas

Webminar

Recommendations:

- Please turn off your microphone.
- There will be 90 minutes of presentation and 30 min of questions and answers.
- Questions should be in writing, through the Chat or by email to: Infectioncontrol@paho.org
- The presentation will be available on the PAHO website in 48 hours.

Acknowledgment

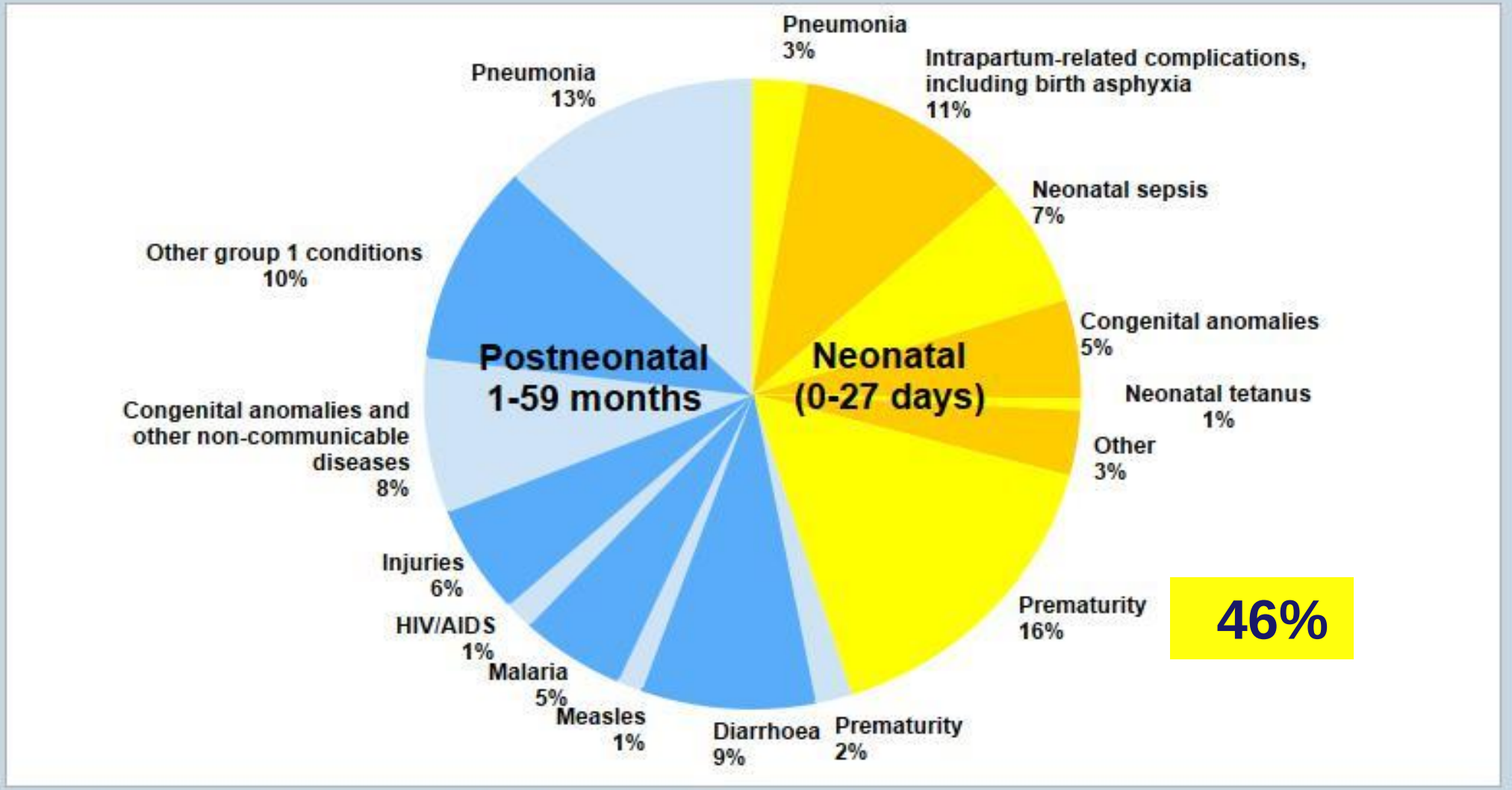
This seminar was possible thanks to the auspices and cooperation of the Infection Control Center (CDC), according to the cooperation agreement CDC-RFA-CK13-1301. "BUILDING CAPACITY AND NETWORKS TO ADDRESS EMERGING INFECTIOUS DISEASES IN THE AMERICAS"

Risk factors and Prevention of Infection in Neonatology

Profa Dra Roseli Calil
Hospital da Mulher Prof. Dr. José Aristodemo Pinotti
Centro de Atenção Integral a Saúde Mulher
CAISM – UNICAMP

Causes of deaths among children under 5 years, 2015

World Health Organization



Source: WHO-MCEE methods and data sources for child causes of death 2000-2015
(Global Health Estimates Technical Paper WHO/HIS/IER/GHE/2016.1)

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Infant Mortality in Brazil and other America´s countries

- Perinatal conditions are the most frequent cause of death in the first year of life and in children under five.

- Most infant deaths occur in the first days of the child's life, and for reasons considered to be avoidable, such as infection, asphyxia at birth and complications of prematurity

Infection associated with Neonatal ICU Care

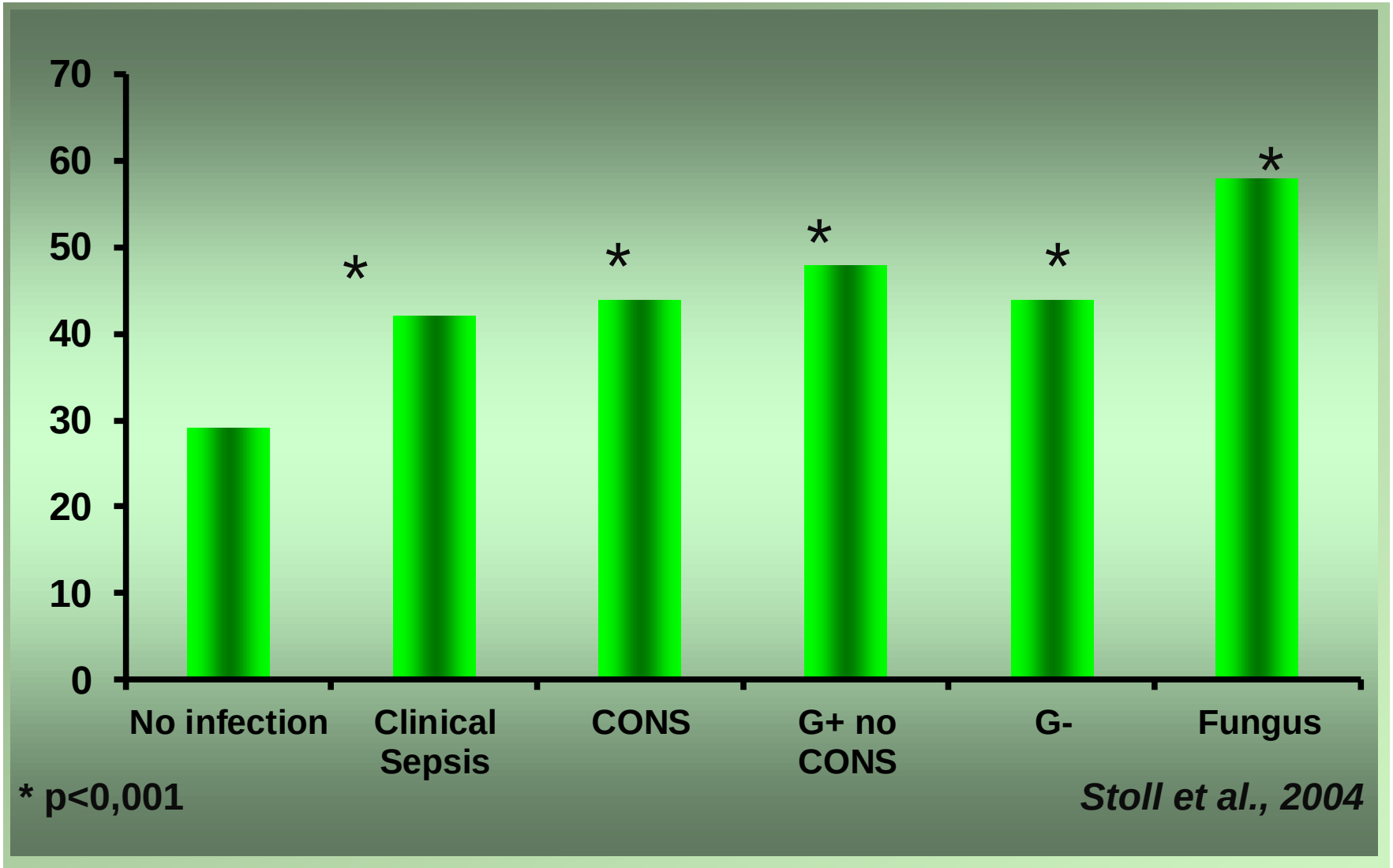
Infections are among the leading causes of mortality and morbidity in neonatal intensive care units.

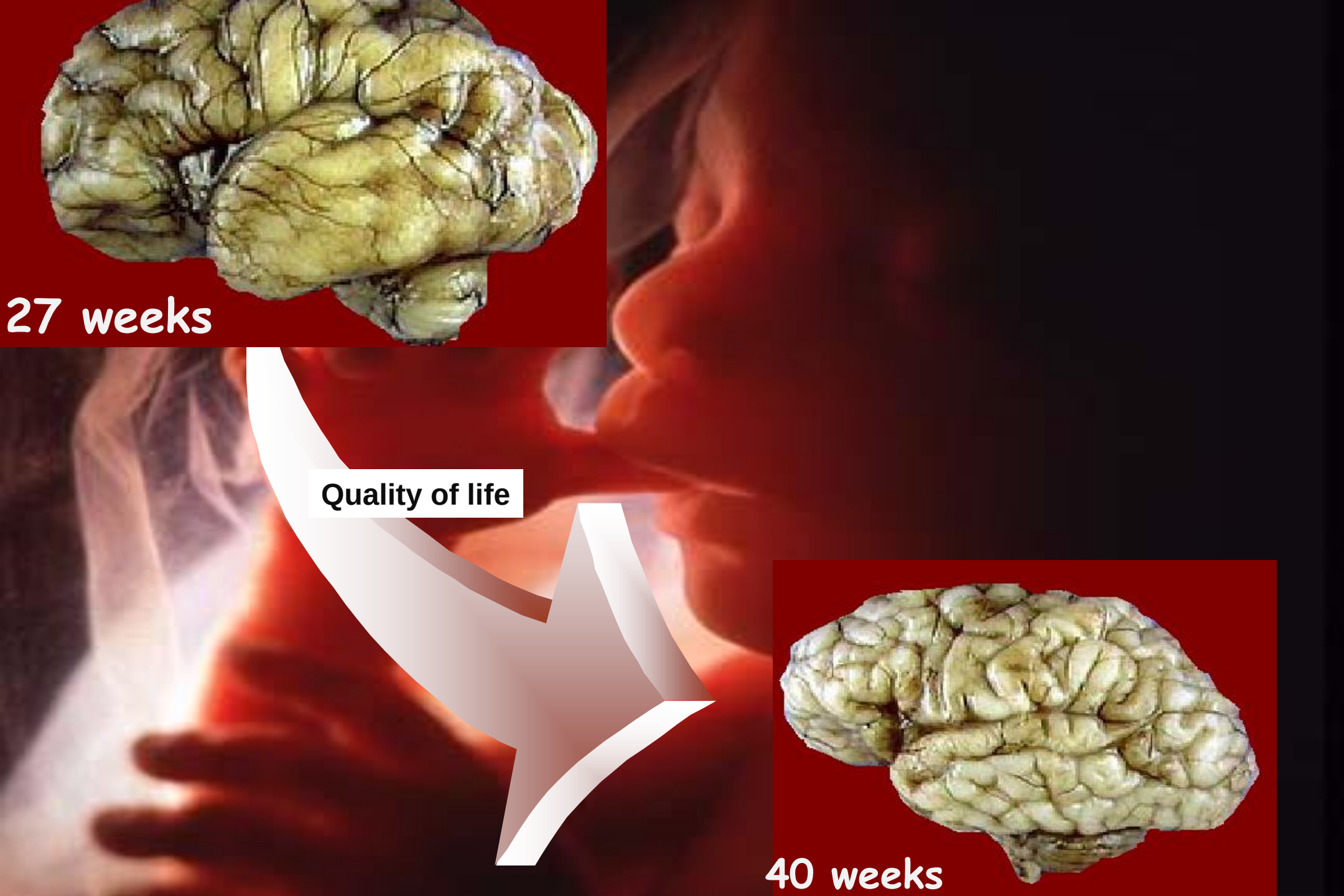
A. Borghesi, M Stronati J Hosp Infection (2008) 68, 293-300

MAIN morbidities associated with prematurity

- **Ischemic and haemorrahagic Central Nervous Sistem (CNS) lesions and neurodevelopmental disorders ***
- **Retinopathy of prematurity**
- **Hearing Loss**
- **Bronchopulmonary dysplasia**
- **Growth Abnormalities**

* Neurodevelopmental abnormalities
NB <1000g birth weight with late sepsis




27 weeks
Quality of life
40 weeks

Threats

Outbreaks of infection

Bacteria, fungi, virus

NEONATAL SEPSIS - RISK FACTORS

Early onset sepsis
≤ 48 hours

Probable mother to child transmission

- Maternal colonization by *S. agalactiae*
- Chorioamnionitis
- Premature rupture of membranes
- Prolonged rupture of membrane (> 18h)
- Preterm birth (<37 weeks)
- Multiple gestation
- UTI <48-72 h treatment

Late sepsis
> 48 hours

- Prematurity – low birth weight
- Central venous catheter
- Mechanical ventilation
- Invasive Procedures
- Prolonged parenteral nutrition
- Fasting - absence of maternal Breast Milk / breast milk Pasteurized
- Prolonged use of antibiotics

Late Onset Sepsis - Risk Factors

- Need for invasive procedures
  - Central venous catheter > 10 days
  - Tracheal tube or use of nasal CPAP
- Use of H2 blocker
- Gastrointestinal tract disease
- Males> gram negative sepsis and meningitis
- Afro descendents> late sepsis and infection

Berry, ALA et al

Risk Factors

The structure and human resources

PATIENT OVERCROWDING ABOVE LOCAL CAPACITY

REDUCED TRAINED STAFF PROPORTION

RISK FOR INFECTION

Risk Factors
Infrastructure

Deficiency in hospital infrastructure:

Pharmacy, nutrition, formula production area,

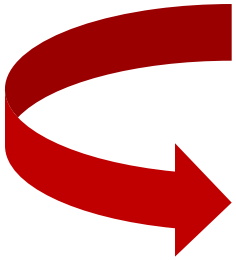
Human Milk Bank, supplies, hygiene and cleaning

Risk of Infection

Indiscriminate use of antibiotics

Early and late neonatal sepsis

High mortality (50%) when untreated



Exaggeration in diagnosis

Often treated unnecessarily

Emergence of MDR bacteria.

The Role of Intestinal Colonization

- In preterm infants in NICUs, the proliferation of a pathogenic microflora in the gut is a step that precedes bacterial translocation.
- Impaired intestinal barrier function does not protect the host from the spread of pathogens into the bloodstream.
- This spread is usually caused by gram-negative bacteria and fungi

Impact of abusive empirical use of antibiotics

- A study conducted by Cotten et al related the increase in the occurrence of necrotizing enterocolitis and death among 4093 extremely low birth weight infants who received empiric antimicrobial treatment for time ≥ 5 days

Cotten et al. Pediatrics. 2009; 123(1):58-66

REDE BRASILEIRA DE
PESQUISAS NEONATAIS

Results 2009 - 2010
Association with Late Sepsis

- Male gender
- Ventilation at birth
- Use of vasoactive drugs in the first 72 hours
- Mechanical ventilation and use of catheters
- Antibiotic therapy in the first 72 hours increased the risk of clinical and laboratory confirmed sepsis by 56% ($p < 0.001$)

Rugolo L; Bentlin RBP; RBPN–abstract Congresso Perinatologia 2012

Good Practices in Newborn Care and Prevention of Neonatal Care-Related Infection as Strategies for Reducing Infant Mortality

"A work for many hands"

Profa Dra Roseli Calil

Hospital da Mulher Prof. Dr. José Aristodemo Pinotti

Centro de Atenção Integral a Saúde Mulher

CAISM – UNICAMP

National Criteria of HAI in Neonatology - Brazil

Health Care Associated Infection

HAI IN NEONATOLOGY

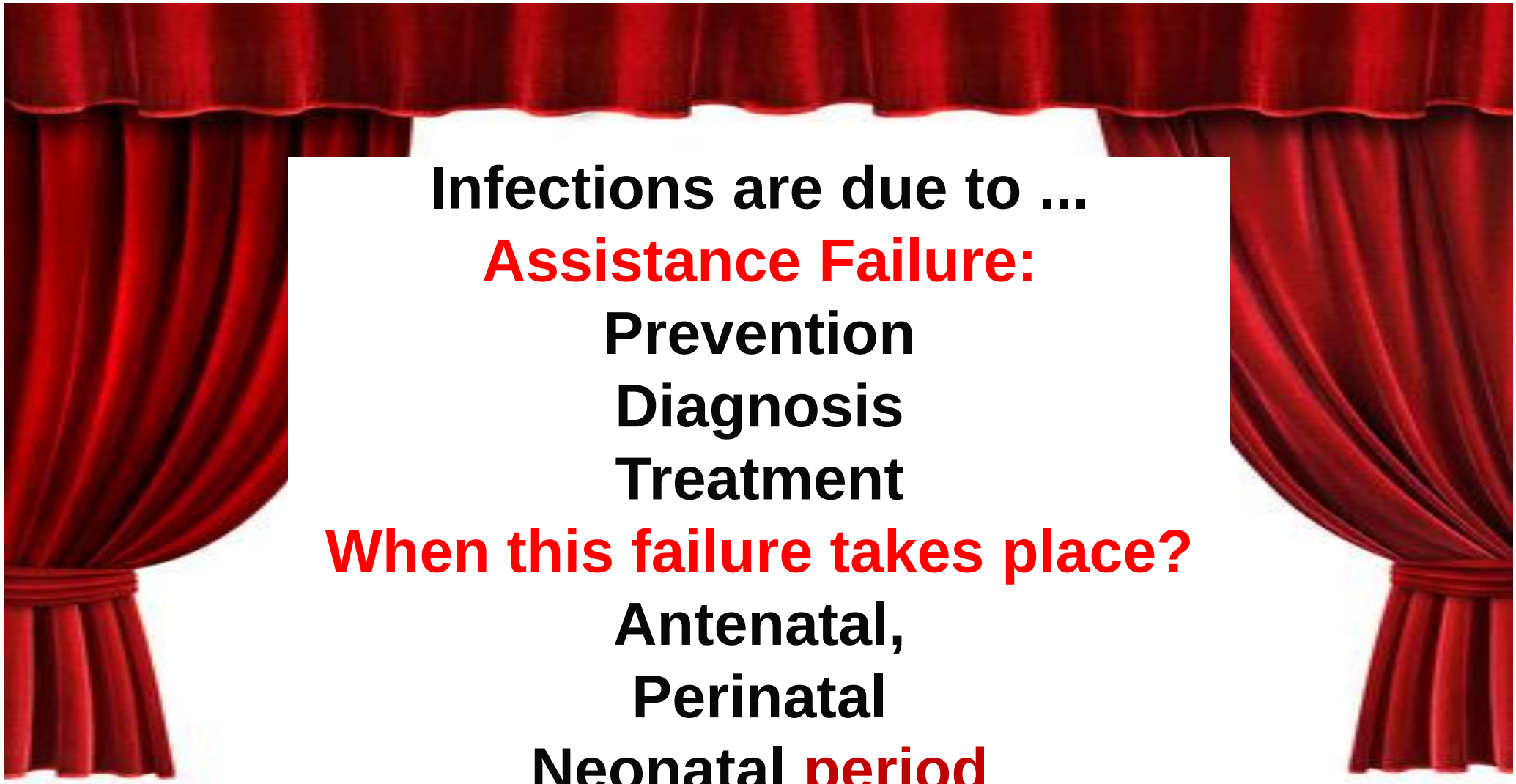
Congenital Infections

Early Infections ≤ 48 hours

Late infection > 48 hours

www.anvisa.gov.br - 2010, atualização 2013

HAI in neonatology



Infections are due to ...

Assistance Failure:

Prevention

Diagnosis

Treatment

When this failure takes place?

Antenatal,

Perinatal

Neonatal period


HIV is not for kids
Sifilis is not for kids too

Where can we start?

Antenatal care

Screening for Group B Streptococcus - When?

- 35 - 37 weeks
- Premature bag rupture
- Preterm Labor

Important:

Collect timely examination result

Assess the need for chemoprophylaxis intrapartum

CDC Prevention 2010

Antimicrobial prohylaxis for Group B Streptococcus - When?

- **Premature membrane rupture**
- **Preterm Labor**
- **Intrapartum fever**
- **Previous child with invasive GBS infection**
- **Positive urine culture for GBS in this pregnancy**
- **Positive screening cultures for GBS**

Elective C section – not indicated

ALWAYS prescribe prophylaxis, it doesn't matter wether she was treated previously!

Group B Streptococcus Chemoprophylaxis

Who to use?

1 - Pregnant women colonized by GBS in the vagina and / or rectum during current gestation except c-section without labor and intact amniotic pouch

2 - Pregnant woman with unknown GBS status in labor and one of the risk factors present:

- Long-term rupture of membranes ≥ 18 hours
- Preterm labor or bag rupture <37 weeks
- Intrapartum fever (≥38ºC)

CDC prevention: 2010

Group B Streptococcus Chemoprophylaxis

Who to use?

3 - Mothers with GBS isolated in urine during pragnancy.

4 - Mothers who had a previous child Group B streptococcal disease

CDC prevention, 2010

Prevention of HAI in Neonatology

Fundamental strategies

Reduction of cross-transmission of microorganisms

Rational Use of Antibiotics

Antimicrobial stewardship

A. Borghesi, M Stronati J Hosp Infection (2008) 68, 293-300

HAI in Neonatal ICU Prevention

To prevent HAI:

- Limit susceptibility to infections by increasing host defenses,
- Stop the transmission of organisms by health professionals
- Promoting the judicious use of antimicrobials

A. Borghesi, M Stronati J Hosp Infection (2008) 68, 293-300

Prevention of HAI in Neonatal ICU

- Practices of hand hygiene
- Prevention of blood infections associated with the central venous catheter;
- Judicious use of antimicrobials for therapy and prophylaxis
- Skin care
- Early enteral feeding with human milk.

A. Borghesi, M Stronati J Hosp Infection (2008) 68, 293-300

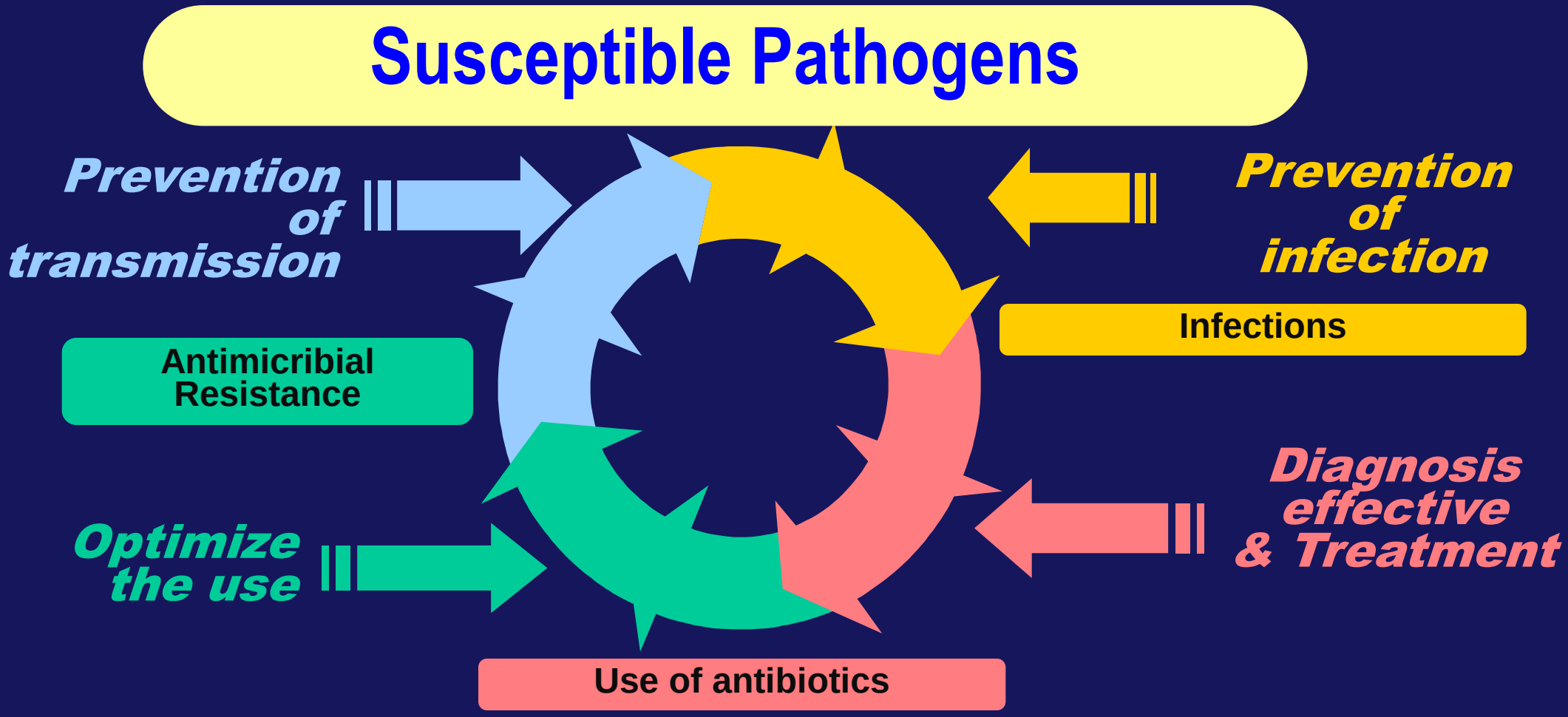
INCENTIVE TO MATERNAL BREASTFEEDING

Early introduction of Maternal Milk assists in the balance of the intestinal microbiota.

Human milk contains anti-candida antibody, mature white blood cells, lysozyme and lactoferrin, capable of protecting the premature of colonization by fungi

Lactoferrin: antibiotic-like action

Antimicrobial Resistance: Key Prevention Strategies



Clinical Framework - Annex 1 ANVISA (BRAZIL)

- Hypoactivity / lethargy
- Thermal instability (hypothermia or hyperthermia)
- Glucose intolerance
- Apnea, bradycardia
- Respiratory distress
- Food waste
- Hemodynamic instability - Shock
- Hemorrhagic syndrome

Low positive predictive value *

Hypotension PPV - 31%

Seminars in Perinatology vol 27, N 4,2003: pp 293-301

Infection in Neonatology
LABORATORY DIAGNOSIS

- Complete blood count – low specificity (high NPV)
- Serial CRP (high NPV)
- Gasometry - non-specific, sign of severity
- Coagulogram - signs of bleeding
- Cultures: blood cultures two samples from different sites, CSF, urine culture (late sepsis screening)
- Radiological examination

BLOOD CULTURE - VOLUME SAMPLE

Effect of shoot volume and bacterial or fungal density on the probability of detecting 1 or more micro-organisms in the culture flask - automated method

	Volume sample (ml)*			
UFC/ml	0,5	1,0	2,0	4,0
1	39	63	87	98
2	63	87	98	99
3	78	95	99	99
4	87	98	99	99

* It also influenced the sample positivity time

Schelonka et al, 1996

NEONATAL SEPSE MARKERS
HEMATOLOGICAL EVALUATION

Diagnostic test	Sensitivity	Specificity	PPV	NPV
Total leukocytes	44	92	36	94
I / T ratio (> 0.2)	54,6	73,7	2,5	99,2
Plaque (> 150,000)	22	99	60	93

Limitations:

Semi-quantitative
Chronological and gestational age curves
What is normal? Premature birth is not "normal"
Inter-analyzer reading variations
Maternal-perinatal-neonatal interferences
"Normal curve" - what is the normal pattern ??

Shah e Padbury, 2014
Shane e Stoll, 2013

NEONATAL SEPSE MARKERS
BIOCHEMICAL MARKERS

Diagnostic test	sensitivity	specificity	PPV	NPV
PCR (>1 mg/dl)	**70-93**	**78-94**	**7-43**	**97-99,5**
PCT (>5,38 mg/dl 24 HV)	**83,3**	**88,6**	**83,3**	**88,5**

Considerations:

- quantitative methods
- more defined normality curve
- more established standardization of methods
- non-infectious elevations: PTX, shock, SAM, hypoxemia, postoperative.
- temporality
  - PCR "late" marker - characteristic rise 12-14 h - serial dosing
  - PCR peak 2 to 3 days
  - PCR remains high until infection control
  - PCR tends to normalize 5-10 days of treatment
  - Procalcitonin - normal elevation at 24 h of life, earlier than PCR

Shah & Radbury, 2014

CRP - Low PPV in Early Sepsis

Normal value: Up to 1mg / dl or 10mg / l

Can increase from 100 to 1000 x in infection bacterial or other inflammatory conditions:

- Prolonged rupture of membranes
- Perinatal asphyxia
- Respiratory distress syndrome
- Intracranial haemorrhage,
- Meconium aspiration syndrome,
- Abdominal wall defects,
- Recent Immunization

CRP - Serial Dosing

- Normal serial CRP allows for the discontinuation of the empiric antibiotic in cases of suspected sepsis not confirmed by cultures.
- Abnormal value of CRP in the absence of other NB infection data is not indicative of continuity of antibiotic use
- PCR that do not decrease or that rises after 48 hours of antibiotic therapy may suggest treatment failure, stay alert.

Cross-Transmission Prevention - Care of environment

- **Contact: direct and indirect**
- **Contaminated fluids**
- **By air**
- **Vectors**

Hand Hygiene Products

Liquid soap in low-risk units: joint accommodation, high-risk gestation unit, outpatient clinics

Chlorhexidine degermant in units at high risk for infection:

Neonatal unit, adult ICU

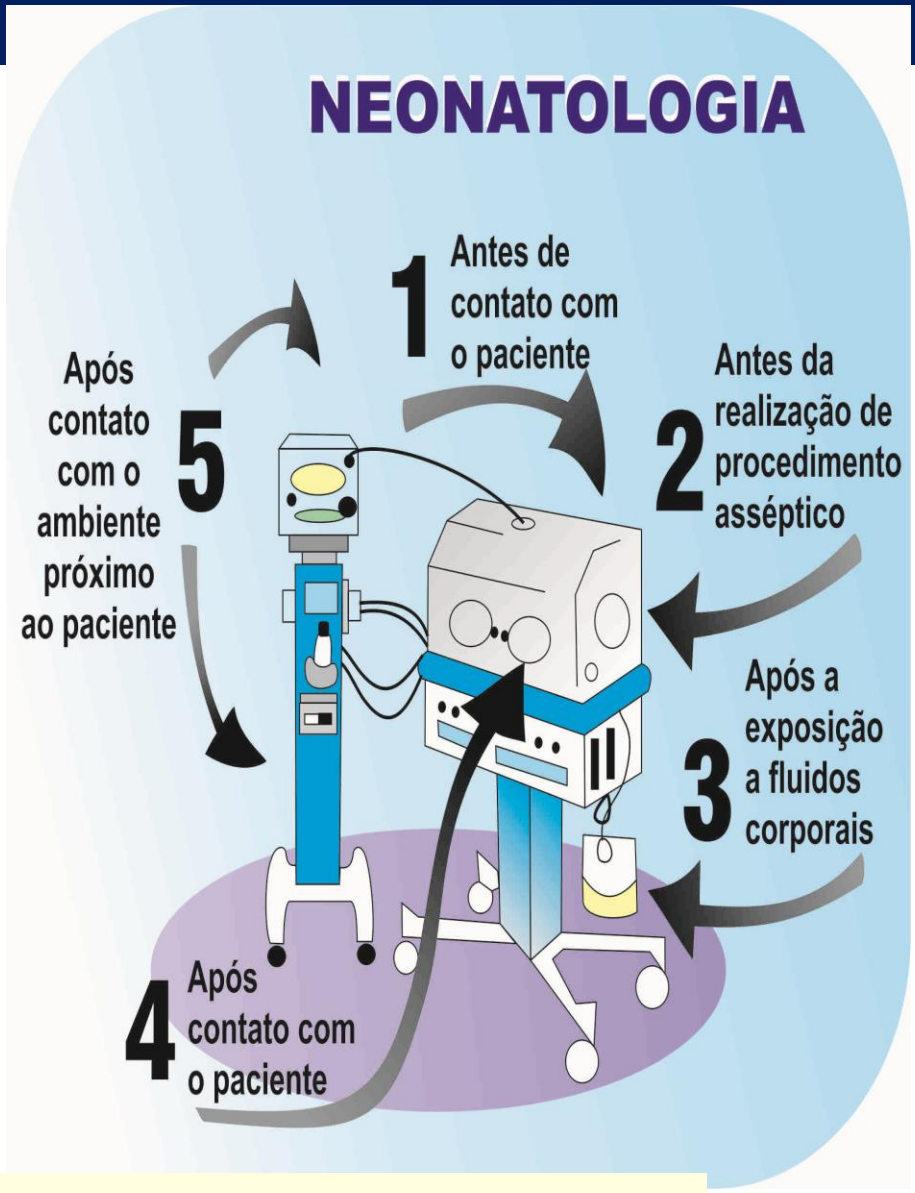
Operating room

Obstetric center

70% Alcohol + 2% Glycerin:

Hygiene in low risk procedures when there is no visible dirt

Make available in every area of assistance



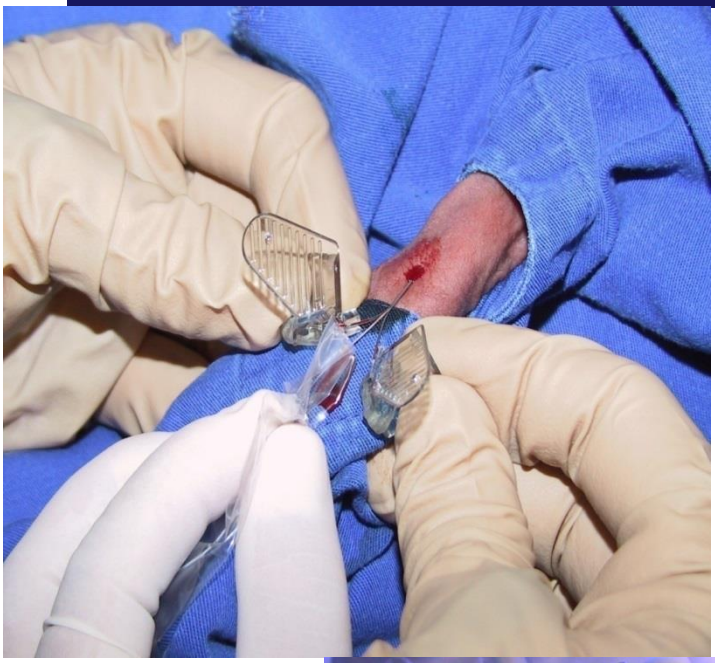
5 moments of hand hygiene OMS, adapted Neo - UNICAMP

Prevention of HAI in Neonatology

Important Strategies

CCIH CAISM/UNICAMP

Prevention of Bloodstream Infection Associated with Central Catheter



Very important

The planning of the Venous Access

Primary Bloodstream Infection Associated with Central Catheter

Catheter present at the time of

diagnosis

or up to 48 hours after removal

CDC-EUA NHSN/ANVISA-Brasil

CATHETER RELATED INFECTIONS

Prevention Measures

Planning for Venous Access

- Selection of the catheter (better polyurethane and silicone)
- Aseptic insertion
- Skin antisepsis and coverage / dressing
- Preparation and quality control of infusions
- Infusion time of parenteral fluids
- Equipment and connection exchanges
- Surveillance of connections

CDC ; MMWR vol 51/RR 10, 2002; CDC Prevention, 2011

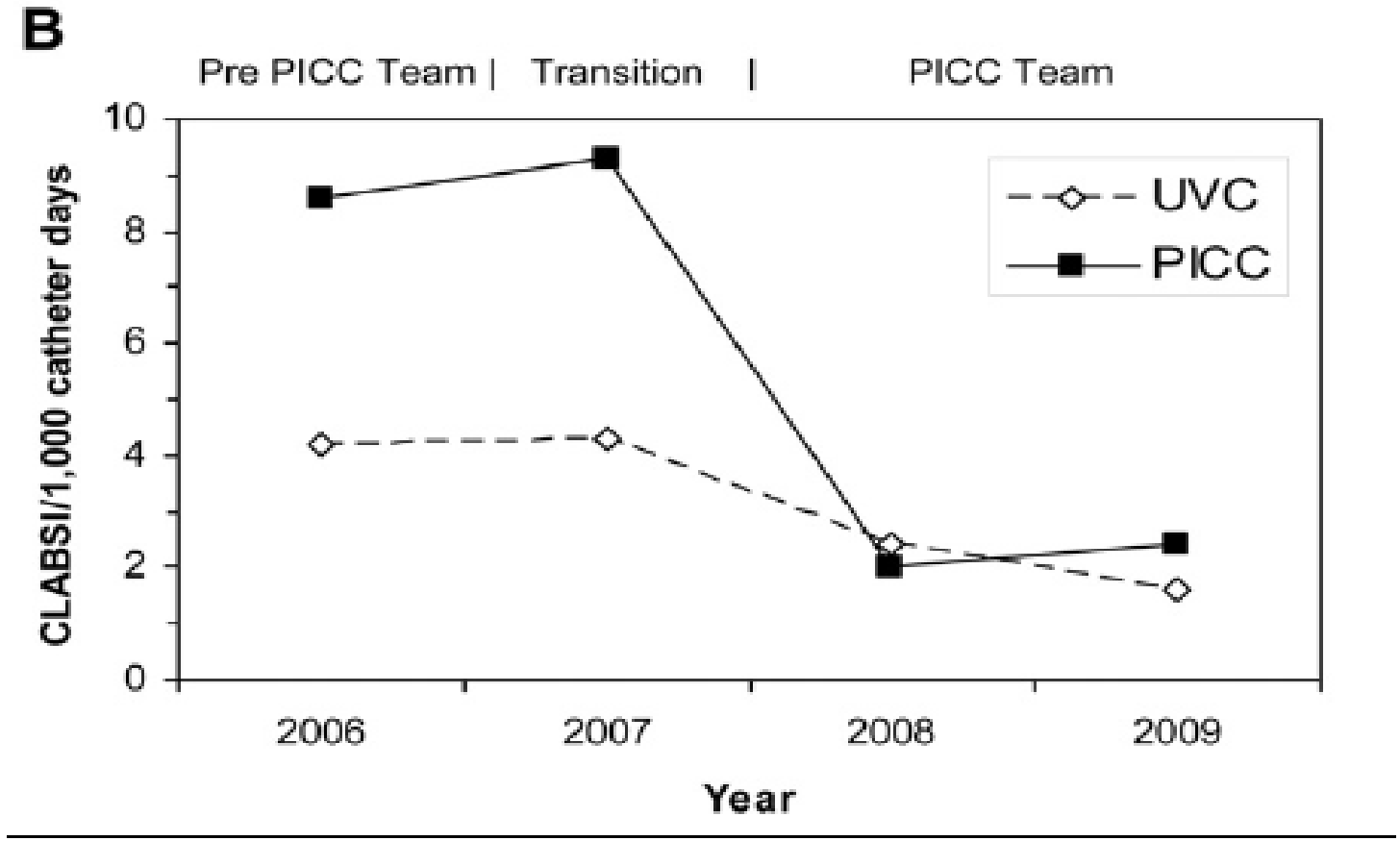
Catheterization of Vein and Umbilical Artery

- Insertion as soon as possible (avoid colonization of the vessel and presence of thrombus)
- Withdrawal 5 - 7 days (above that period increased ICS risk)
- Bridging - allows cleaning of the umbilical stump and prevents displacement of the intra-luminal catheter

BUTLER-O'HARA et al, THE JOURNAL OF PEDIATRICS Vol. 160, No. 6, June 2012

Implact BSI/Catheter– Time of PICC

There was a reduction in DI of BSI associated with CVU and PICC after introduction of the PICC team. A sharp reduction in DI-PICC



BUTLER-O'HARA et al, THE JOURNAL OF PEDIATRICS Vol. 160, No. 6, June 2012

Guidelines for the Prevention of Intravascular Catheter-Related Infections, 2011

Central Catheter Insertion

- Full paramentation
- Skin preparation with alcoholic chlorhexidine> 0.5% (category I A)
- Avoid use of PVPI
- Preferably use silicone or polyurethane catheter

CDC Prevention, 2011

Fixing the PICC

Do not cut catheter tip at insertion, risk of mechanical complication

Janet Pettit, JAVA: 2006 Vol. ll № 4

Trimming of Peripherally Inserted Central Catheters: The End Result

Figure 1. Instruments used to trim catheters, including scissors, a trimming tool, and scalpel blade.

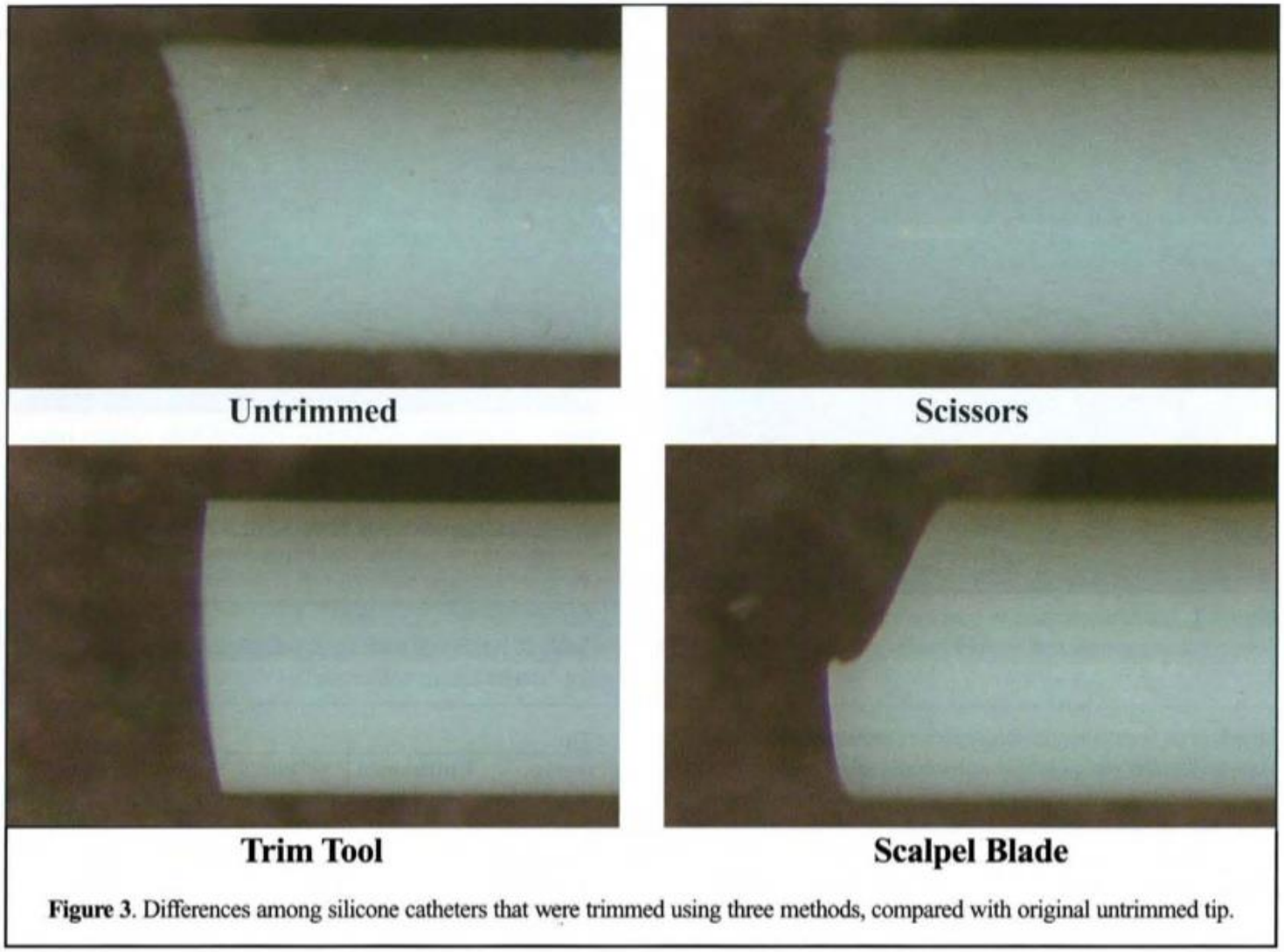


Figure 3. Differences among silicone catheters that were trimmed using three methods, compared with original untrimmed tip.

Janet Pettit, JAVA: 2006 Vol. ll № 4


Avoid situation like this
TPN
Must have a
dedicated line

Option for administration of several Central Catheter drugs with double lumen

Changing Bandages - What Has Changed?

- Gauze dressing: 48 hours or earlier if necessary

→ Clear dressing - only peeling or signs of bleeding

- **Hand hygiene with antiseptic**
- **Use of 0.9% SF and alcoholic chlorhexidine**

PICC - dressing change

- Use aseptic technique
- Always make 2 people to avoid traction of the catheter

CDC Prevention 2011

Central Venous Catheter Insertion and Maintenance Bundle in Neonatal Intensive Care Units

NICU – UNICAMP - BRAZIL

Controle de Infecção em Neonatologia - O que posso mudar ?

não posso mudar

Fatores de risco para infecção intrínsicos do RN

- Prematuridade.
- Baixo peso.
- Estado imunológico.
- Doenças associadas ao nascimento.
- Colonização da pele.

A necessidade de procedimentos invasivos de acordo com a gravidade do RN

O que posso mudar

✔ **O processo de trabalho**
-Adesão de toda equipe as medidas de prevenção e controle de infecção.
-Adesão às boas práticas nos procedimentos invasivos.

✔ **Inserção do cateter central; Técnica asséptica**
-Higienização das mãos com clorexedina degermante.
-Uso de barreira máxima (gorro, máscara, avental e luva estéril).
-Uso de clorexedina na antissepsia da pele do RN.

✔ **Acesso venoso periférico**
-Higienização das mãos com clorexedina degermante.
-Luvas de procedimento.
-Antissepsia da pele com clorexidina alcoólica.
-Evitar múltiplas punções.

✔ **Manuseio do cateter central ou acesso venoso periférico**
-Higienizar as mãos antes e após o manuseio.
-Utilizar luva de procedimento sempre que houver risco de contaminação com sangue.
-Desconectar o sistema somente com técnica asséptica.
-Ao desconectar a tampa protetora da torneira de 3 vias ou plug do sistema, substitua por outro estéril.
-Na manipulação do hub, torneiras de 3 vias e extensores, realizar fricção com alcool a 70% por 10 segundos em toda superfície.

O que posso mudar

-Na coleta de sangue através de cateter arterial umbilical realizar fricção com alcool a 70 % no plug antes da punção.

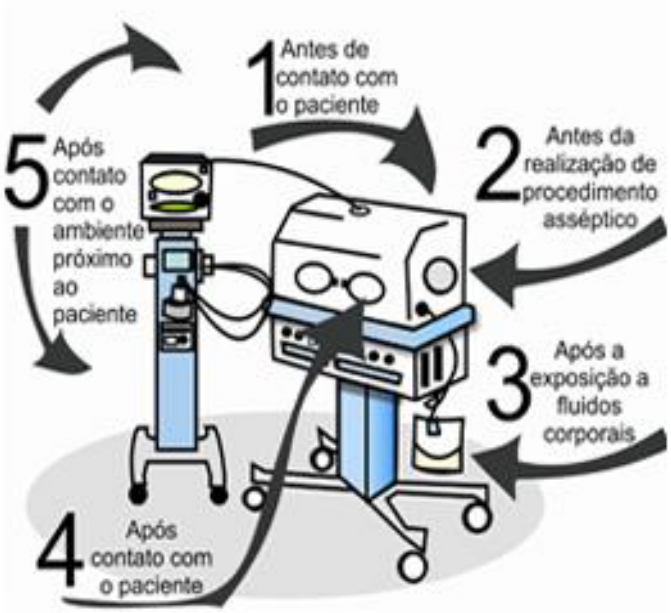
✔ **Troca de dispositivos (extensor, conectores e torneira de 3 vias)**
-Realizar diariamente, ou antes, se houver quebra de técnica ou acúmulo de sangue.

✔ **Troca de curativos**
-Realizar em 2 pessoas utilizando técnica asséptica.
-Curativo com gaze a cada 24 horas, ou antes, se houver sujidade.

Troca curativo transparente somente se necessário

✔ **M**
-Acompanhamento da inserção do cateter por um profissional de enfermagem.
-Preencher o chek list de vigilância do cateter no momento da inserção, após controle radiológico, após realização de curativo e retirada do cateter.
-Vigilância constante com relação a infusão de fluidos.
-Avaliação diária das condições do cateter.
-Avaliação diária da necessidade de manutenção do cateter.

Adesão a Higienização das Mãos



5 momentos para a higienização das mãos

Referências Bibliográficas:

-Cooley K, Grady S. Minimizing catheter-related bloodstream infections: one unit's approach. Adv Neonatal Care.2009 Oct;9(5):209-26; quiz 227-8.

-World Health organization.Clean Care is Safer Care.SAVE LIVES: Clean Your Hands.[Acesso em 16 nov 2009]; Disponível em: http://www.who.int/gpsc/5may/en/index.html

-Mendonça SHF. Impacto do uso de conectores sem agulha para sistema fechado de infusão na ocorrência de infecção de corrente sanguínea relacionada ao cateter venoso central: evidências de uma revisão sistemática [Dissertação-Mestrado] São Paulo-SP: Universidade de São Paulo; 2008.

Realização:

SERVIÇO DE ENFERMAGEM EM NEONATOLOGIA
CCIH CAISM/UNICAMP
GRUPO DE ESTUDO DE CATETERES VENOSO

Criação/Arte
Malim Luci José Ciurcio
Giovanna Mantovani Chaves

Apoio

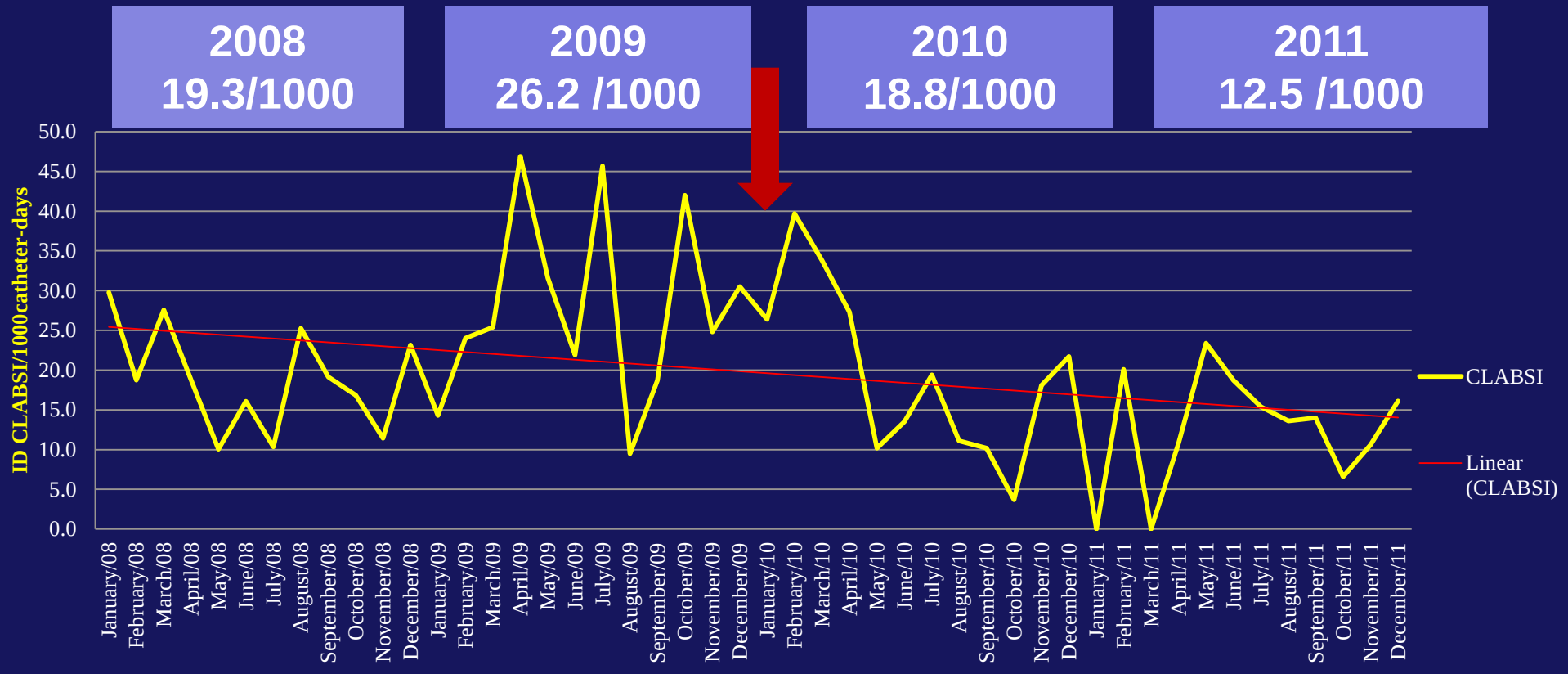
Divisão de Enfermagem
CAISM - Unicamp

Dezembro 2009

UNICAMP
Hospital da Mulher-CAISM-Unicamp

Prevenção de Infecção em Neonatologia

NICU - UNICAMP 2008-2011
ID CLABSI/1000 catheter-day



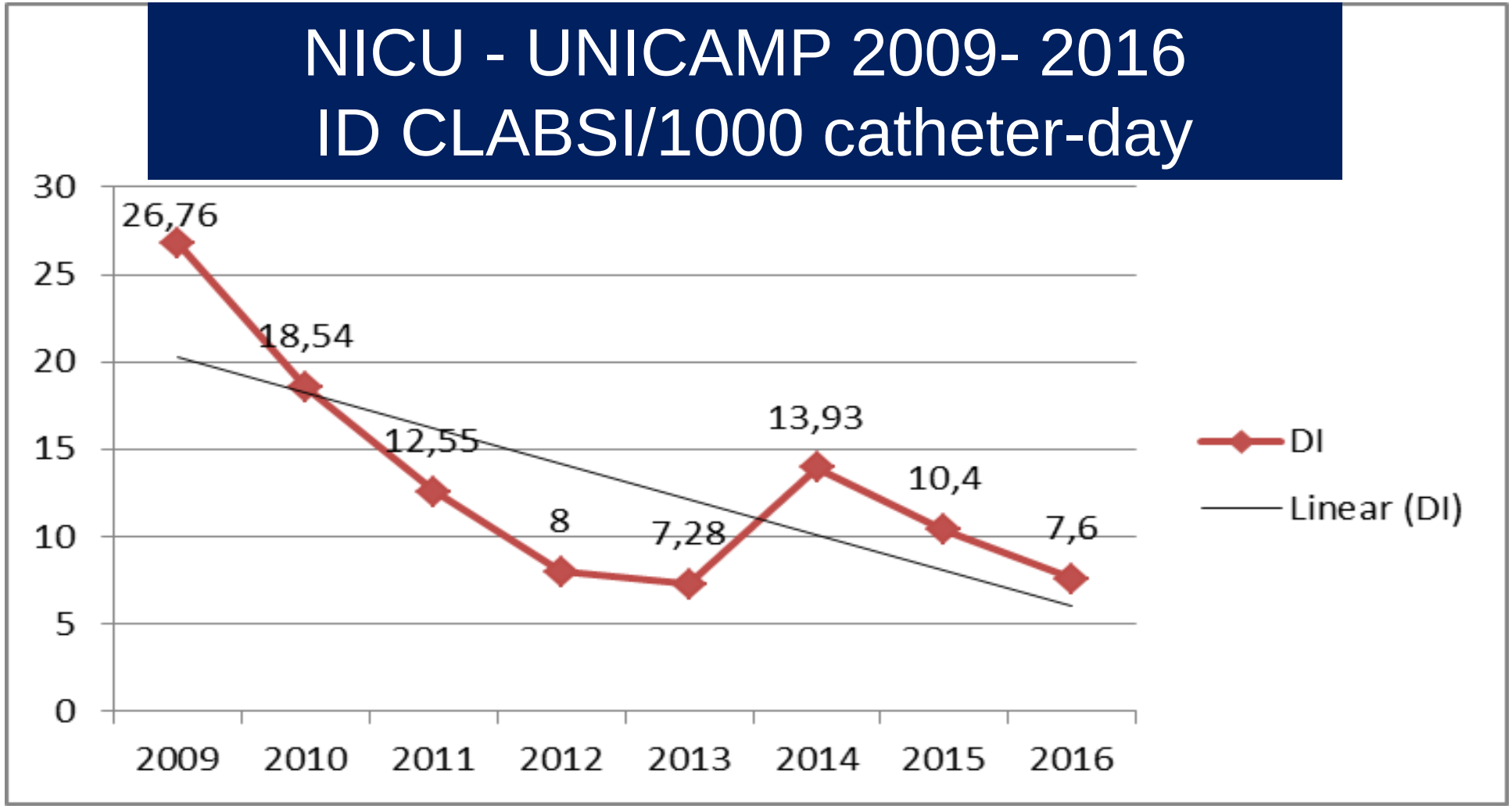
70% CLABSI was laboratory confirmed

76,6% Staphycolococcus coagulase negative especies, 2% Candida sp

Staphylococcus epidermidis was the main agent of CLABSI

Calil et al, 2012

NICU - UNICAMP 2009- 2016
ID CLABSI/1000 catheter-day



ID CLABSI: $\frac{\text{Total CLABSI}}{\text{Total catheter-day}} \times 1000$

Prevention of Mechanical Ventilation Associated Pneumonia

Prevention of Mechanical Ventilation Associated Pneumonia

- Traumatic intubation or less traumatic and for the shortest possible time
- Whenever possible, switch to noninvasive ventilation (NIV)
- Proper attachment of the tracheal tube
- Avoiding unscheduled extubation
- Provide oral hygiene (III) - oral hygiene is recommended from the first days of life, initially by cleaning the gums with gauze.

KLOMPAS, et al., 2014; YOKOE, et al., 2014).

CPAP and noninvasive ventilation is a good practice

Adequate fixation is very important


OXIGÊNIO


OXIGÊNIO
inter 3
3.50
1:2.0
0.50
0 15
0 3
ILUMINAÇÃO AUXILIAR
DESL
LIGA
INSTRUÇÕES
OXIGÊNIO
MR410
CAUTION

Non-programmed extubation prevention
Practical conduct

- **To know the location of the tube - radiological control after intubation**
- **Record of the conduct after radiological examination - inform in medical record and in daily medical prescription the number that the tube was fixed**
- **Adequate sedation without over prescribing**
- **Noise control and other non-medicinal measures to calm NB**
- **Minimum RN manipulation - for weight control, sheet changes, exchange of tracheal tube fixation perform in two people**

Calil R e cols, **Guia OPAS Prevenção IRAS Neo 2017**

Prevention of Mechanical Ventilation Associated Pneumonia

Tracheal aspiration: when necessary

The aspiration frequency of the tracheal tube should be adapted to the condition of each patient, considering the quantity and quality of secretion, the risks inherent in disconnection and the reduction of pressure in the airways during aspiration.

Closed-ended tracheal aspiration device does not alter VAP, length of hospital stay or mortality, but the evidence has poor quality

The use of a closed tracheal aspiration system aims to avoid the sus tained fall of positive airway pressure when this is necessary for the treatment of severe restrictive lung disease.

KLOMPAS, et al., 2014; YOKOE, et al., 2014

Prevention of Mechanical Ventilation Associated Pneumonia

Aseptic aspiration technique:

- **Sterile procedure gloves (... CDC issue NS)**
- **sterile aspiration probe**
- **Discard probe after use**

- **Change bottle and latex exension every 24 hours**

Calil R e cols, **Guia OPAS Prevenção IRAS Neo 2017**

Humanization of Care

Patients & Families
Health professionals

- **Special attention to the risk of transmission of transmissible infectious diseases**
- **Environment of credibility and well-being**

Signs of stress

- CF <120 or> 160 bpm;
- RF <40 or> 60 pm;
- Oxygen saturation <92%.
- Irregular breathing
- Color change, visceral signs
- Flaccidity
- Tremors, scares, sudden movements
- Extension, contortion
- Frequent tongue extension
- Fingers out or closed hands
- Greeting, "sitting in the air", "airplane wings"
- Cramping, yawning, frequent sneezing
- Looking at amazement, grimace
- Floating eyes,

Attention
Do not mistake with ... infection ...

HUMANIZED ATTENTION TO THE NB

Decrease in brightness

Noise Reduction

Temperature control

Individual attention

Attention Humanized

Pain Reduction

HUMANIZED ATTENTION TO THE NB

Calming the NB

Weight control

peso

Newborn Bath

It has to be nice.

Only with stable NB

No venous access

Without mechanical ventilation

Suitable temperature

Kangaroo Method

Assess maternal health conditions

Guide hands and body hygiene

Weigh the risk benefit in maintaining skin-to-skin contact under the Viral Acute Respiratory Infection or Surgical Site Infection

HUMANIZED ATTENTION TO THE NB

SKIN-SKIN CONTACT

Assess risk and benefit in each situation

Humanizing is also Individualizing Care

Skin-to-skin contact features in a mother colonized by MDR bacteria

- NB child of mother colonized by MDR hospitalized in ICU or neonatal ICU is placed in contact precaution.
- Staff should wear aprons and gloves for contact precaution.
- Mother colonized by MDR bacteria does not need to wear gloves to touch the NB, only perform hand hygiene before and after touching the NB, as well as avoid touching the outer surface of the incubator and near-bed space.
- With this measures, skin-to-skin contact can be performed normally, and without the use of gloves.

INCENTIVE TO MATERNAL BREASTFEEDING & Nutrition Security

- **Beginning of breastfeeding in the first hour of life for normal NB.**

- **Incentive to initiation of early minimal enteral feeding for premature newborns**

- **Organization of the Human Milk Bank structure**

- **Good practices in the collection, storage, portioning and administration of human milk**

Maternal Milk Collection at home

- Quiet location, avoiding toilets and/or outbuildings where pets are found

- Remove adornments and avoid using perfumes
- Wear cap and mask

MATERIAL SUPPLIED FOR HOUSEHOLD MILK COLLECTION

- Thermal box
- Sterile bottle
- Gelox
- Cap
- Mask
- Liquid soap

Pasteurization Human Milk before nosocomial use

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Administration of milked maternal milk

NON-NUTRITIVE SUCTION

Maternal Breast Enteral Transition

Neonatal outpatient setting

Follow-up of the NB
Support for Breastfeeding

What we want?

Survival and quality of life

- Safe care is of utmost importance to prevent HAI and, ultimately, to prevent brain damage and other morbidities

Challenges

Changes in the hospital environment

Reflect Practice

Caring for who cares

Managers involved in the change process

Communication

Multidisciplinary team integration:

Routines should be known and followed by ALL

- Physicians of neonatology
- Nursing
- Pediatric Surgery, Neurosurgery
- Neurology, Cardiology, Ophthalmology
- Physiotherapy, Speech Therapy, Psychology, Nutrition Service, Social Work, etc.
- Surgical Center Team
- Obstetric Center Team

Integration of routines with their suppliers:

- Formula production area and human milk bank
- Local Pharmacy and Pharmacy Provider of TPN
- Hygiene and cleanliness, Wardrobe / laundry room
- Center for Sterilized Material
- Radiology/Immaging
- Laboratory
- Procurement

Motivation and Team Treaning

Continuing Staff Education / Service Education

IPC team - Feedback to the clinical team

Participation of professionals in work groups

- **catheter group**
- **respiratory care group**
- **skin care group**
- **parent group, palliative care group**
- **Breastfeeding incentive group**
- **wound care group**

HAI Prevention – Neonatology Units

- Obsession for hand hygiene
- Education and constant reinforcement to all staff
- Avoid overcrowding
- Maintain adequate proportion of nursing / NB
- Apply standard precautions when contacting the patient.
- Restrictive Drug Delivery System
- Correct disinfectant application for cleaning equipment
- Restrict use of antibiotics especially third-generation cephalosporins
- Continues infection monitoring and surveillance

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Practice Transformation

Do not want **Make different** **Thinks**

WE NEED TO MAKE DIFFERENT

WHAT WE DO **!!!**

To achieve the improvement in the assistance it is necessary ...

A **Believe the possibility of change**
M **Multiplication of knowledge acquired**
O **Organization of Work Processes**
R **Social responsibility**

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We have a long way to go,
but I think we're on the right track ...
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