

Hälsa- och sjukvårdsnämndens förvaltning
STOCKHOLMERS LÄNS LÄROVÄRDSTÄMMA
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Utbrott på neonatalavdelningar

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Utbrott på neonatalavdelningar till juli 2005

- www.outbreak-database.org
- Täcker ¾ av utbrott beskrivna i Medline.
- Söktes fram till 25 juli 2005.
- 276 outbreaks were reported from NICUs and 453 from other IC.
- *Enterobacteriaceae* were significantly more often responsible for NICU outbreaks, whereas nonfermenting bacteria are more frequently identified in other ICU types.
- On average, 23.9 patients and 1.8 health care workers were involved in NICU outbreaks.
- Average mortality in NICU outbreak was 6.4% (1.5 newborns on average).
- In 48.6% of NICU outbreaks the authors were unable to identify the sources compared with 38.0% in other ICU outbreaks.
- The most important infection control measures were significantly more often implemented in NICUs than in other ICUs.

Gastmeier 2007

Table 1. Causative pathogens in outbreaks in NICUs and non-NICUs

Pathogens	Outbreaks in NICUs n = 276		Outbreaks in non-NICUs n = 453		P value
<i>Klebsiella</i> spp. (thereof ESBL)	56 (14)	20.3%	30 (6)	6.6%	<.001
<i>Staphylococcus</i> spp. (thereof MRSA)	44 (27)	15.9%	91 (72)	20.1%	NS
<i>Serratia</i> spp.	33	12.0%	30	6.6%	.015
<i>Enterobacter</i> spp. (thereof ESBL)	26 (0)	9.4%	20 (2)	4.4%	.011
<i>Pseudomonas</i> spp.	15	5.4%	47	10.4%	.020
<i>Escherichia</i> spp. (thereof ESBL)	15 (1)	5.4%	2 (0)	0.4%	<.001
<i>Salmonella</i> spp.	15	5.4%	7	1.5%	.006
<i>Candida</i> spp.	15	5.4%	16	3.5%	NS
<i>Acinetobacter</i> spp.	13	4.7%	72	15.9%	<.001
Hepatitis virus	7	2.5%	6	1.3%	NS

NS, non significant. Gastmeier 2007

Table 2. Infection types in outbreaks in NICUs and non-NICUs

Infection types	Outbreaks in NICUs n = 276		Outbreaks in non-NICUs n = 453		P value
Blood stream infections	173	62.7%	212	46.8%	<.001
Gastrointestinal infections	57	20.7%	45	9.9%	<.001
Central nervous system infections	55	19.9%	17	3.8%	<.001
Pneumonia	52	18.8%	145	32.0%	<.001
Eye, ear, nose and throat infections	40	14.5%	8	1.8%	<.001
Skin and soft tissue infections	33	12.0%	40	8.8%	NS
Urinary tract infections	31	11.2%	86	19.0%	.007
Other lower respiratory infections	17	6.2%	50	11.0%	.034
Surgical site infections	11	4.0%	100	22.1%	<.001

NS, non significant. Gastmeier 2007

Utbrott på NICU

Top 10 pathogens	No. of outbreaks	No. of patients involved	Average # of patients
<i>Klebsiella</i> spp.	56	1,240	22.1
<i>Staphylococcus</i> spp.	44	1,641	37.3
<i>Serratia</i> spp.	33	896	27.2
<i>Enterobacter</i> spp.	26	402	15.5
<i>Pseudomonas</i> spp.	15	257	17.1
<i>Escherichia</i> spp.	15	392	26.1
<i>Salmonella</i> spp.	15	424	28.3
<i>Candida</i> spp.	15	240	16.0
<i>Acinetobacter</i> spp.	13	178	13.7
Hepatitis virus	7	48	6.9
Total	239	5,718	23.9

Top 10 pathogens	No. of staff involved	Average # of staff	No. of fatal cases	Mortality (%)
<i>Klebsiella</i> spp.	39	0.7	147	11.8%
<i>Staphylococcus</i> spp.	179	4.1	17	1.0%
<i>Serratia</i> spp.	51	1.5	69	7.7%
<i>Enterobacter</i> spp.	16	0.6	9	2.2%
<i>Pseudomonas</i> spp.	6	0.4	27	10.5%
<i>Escherichia</i> spp.	24	1.6	14	3.6%
<i>Salmonella</i> spp.	13	0.9	53	12.5%
<i>Candida</i> spp.	29	1.9	27	11.2%
<i>Acinetobacter</i> spp.	3	0.2	3	1.7%
Hepatitis virus	84	12.0	0	0.0%
Total	444	1.8	366	6.4%

Gastmeier 2007

Table 4. Source of the outbreaks in NICUs and non-NICUs

Sources	Outbreaks in NICUs n = 276		Outbreaks in non-NICUs n = 453		P value
Unknown	134	48.6%	172	38.0%	.005
Patient	55	19.9%	109	24.1%	NS
Personnel	31	11.2%	37	8.2%	NS
Equipment	35	12.7%	69	15.2%	NS
Environment	25	9.1%	78	17.2%	.002
Drug	16	5.8%	7	1.5%	.002
Food	7	2.5%	6	1.3%	NS

NS, not significant. Gastmeier 2007

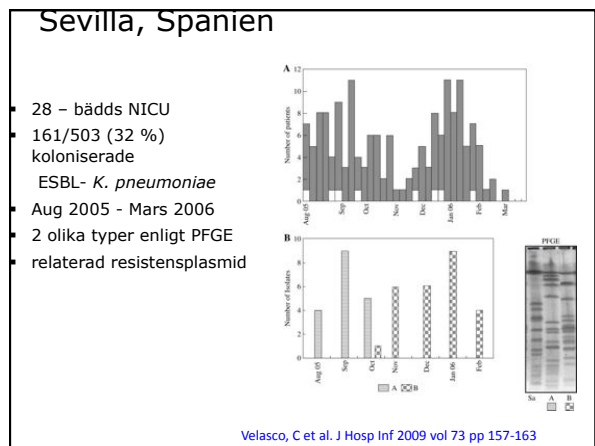
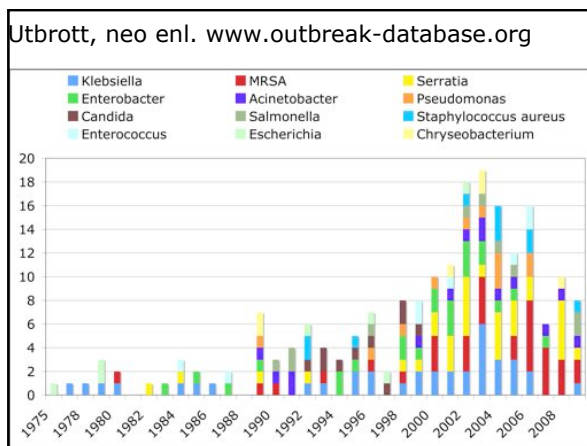
Measures	NICUs n = 276	non-NICUs n = 453	P value
Patient screening/ surveillance	181 65.6%	217 47.9%	<.001
Handwashing/ disinfection	147 53.3%	153 33.8%	<.001
Isolation/cohorting	137 49.6%	154 34.0%	<.001
Personnel screening	121 43.8%	166 36.6%	NS
Modification of care/ equipment	107 38.8%	168 37.1%	NS
Change in antibiotic therapy	104 37.7%	147 32.5%	NS
Sterilization/ disinfection	81 29.3%	145 32.0%	NS
Use of protective clothing	84 30.4%	101 22.3%	.018
Personnel training	57 20.7%	84 18.5%	NS
Closure of the affected location	45 16.3%	57 12.6%	NS
Restriction of workload	13 4.7%	12 2.6%	NS
Vaccination	7 2.5%	5 1.1%	NS
No measure	2 0.7%	0 0.0%	NS
Not mentioned	16 5.8%	49 10.8%	.023

Gastmeier 2007

Utbrott, neo enl. www.outbreak-database.org

Art	Totals
Klebsiella	37
MRSA	33
Serratia	32
Enterobacter	23
Acinetobacter	14
Pseudomonas	11
Candida	10
Salmonella	10
Staphylococcus aureus	10
Enterococcus	8
Escherichia	7
Chryseobacterium	6

Åtkomstdatum: 2010-04-21.
Totalt 270 artiklar, end bakterier och svamp >4 publikationer har tagits med.
Ny sökning 2011-04-10:
9 artiklar under 2010
3 MRSA
2 *S. aureus*
2 *E. coli* ESBL
1 *P. aeruginosa*
1 *K. pneumoniae* ESBL



VRE, neonatal, USA

62-bed neonatal intensive care unit

- 2 infants with clinical cultures positive for vancomycin-resistant enterococci (VRE).
- Surveillance cultures detected 11 infants colonized with VRE.
- Surveillance triggered by even a single clinical culture positive for VRE may be justified in the neonatal intensive care unit, because a single culture result may represent a large hidden reservoir of VRE-colonized infants.

Duchon, *ICHE* 2008; 29:374-376

VRE, neonatal, Israel

11 of 18 patients were infected or colonised
three cases of bloodstream infection and one case of meningitis.

All VRE isolated were *Enterococcus faecium* of the vanA type. Pulsed-field gel electrophoresis suggested that the outbreak was caused by a single strain.

Control achieved by enhanced contact isolation precautions, cohorting of patients and staff, improved environmental decontamination and closure of the unit to new admissions.

Patients with bloodstream infections and meningitis were treated successfully with linezolid.

One year after the outbreak, weekly surveillance detected two patients with faecal carriage of VRE whose periods of admission overlapped.

No further cases of colonisation or disease have occurred in the unit in the two and a half years since then.

Ergaz, *JHI*, 2009

MRSA, neonatal, review, Skottland

- Reagera tidigt
- PAG, problem assessment group
- IMT, incident management team
- Information till personal och föräldrar, muntligt och skriftligt, möten. Asymtomatiska, Infekterade, Ej koloniserade.
- Screening: miljö, patienter, personal, föräldrar, besökare
- Kohortvård
- Behandling av koloniserade, mupirocin, klorhexidin (neobarn???)
- Minska inläggning: grönt, gult, rött
- Storstädning
- Personaltäthet
- Stänga enhet

Laing Arch Dis Child Fetal Neonatal Ed 2009

MRSA, neo, Nantes

April 2004 and August 2007 in a 24-bed NICU, 600 pat/år: 46 positiva av 897, samma klon

Lepelletier, AJIC, 2009

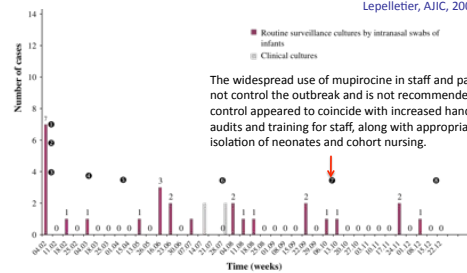


Fig 1. Epidemic curve: Impact of different steps in infection control strategies for a MRSA outbreak in the NICU. Routine surveillance cultures by intranasal swabbing between February 2005 and December 2005. ● Implementation of weekly surveillance cultures for all neonates. ● Decolonization with mupirocin of all neonates with known MRSA colonization. ● Division of neonates into 2 separate cohorts. ● Mupirocin treatment for all neonates hospitalized in the NICU and all HCWs. ● Spacing out of surveillance cultures every 15 days. ● Repetition of weekly surveillance cultures. ● Direct observation of HCWs, implementation of 3 separate cohorts of neonates and HCWs, and increased use of alcohol-based products. ● Cessation of weekly routine surveillance of neonates.

Acinetobacter, NICU, USA

MDR-Ab was identified in the blood of a 24-week gestation, 7-day-old extremely low birth weight neonate.

Enhanced infection control measures were implemented. MDR-Ab was recovered from 6 additional neonates.

Of these 7 MDR-Ab (index + 6) neonates, 4 died, 3 of whom had positive blood cultures, klonal m PFGE.

All affected neonates were born between 23 to 26 weeks gestational age, and were <7 days postnatal age and <750 g (430-720) at the time of exposure.

All were housed within the same room as the index case. None of the other 5 exposed neonates older than postnatal day 7 or weighing >750 g at birth were affected.

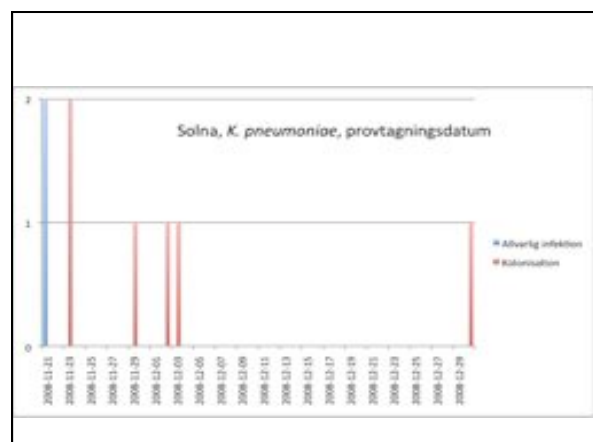
Simmonds, Pediatr Infect Dis J. 2009 Mar;28(3):710-4

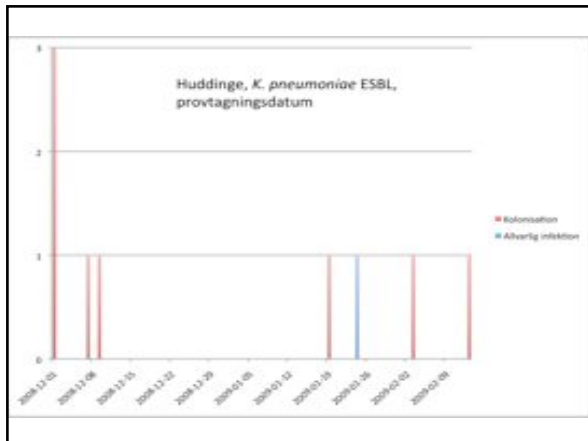
K. pneumoniae ESBL

Karolinska Solna och Karolinska Huddinge, 2008 nov – 2009 feb

Fördelning av fall:

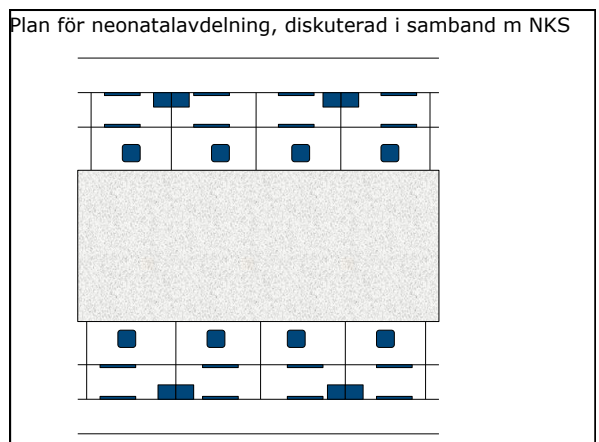
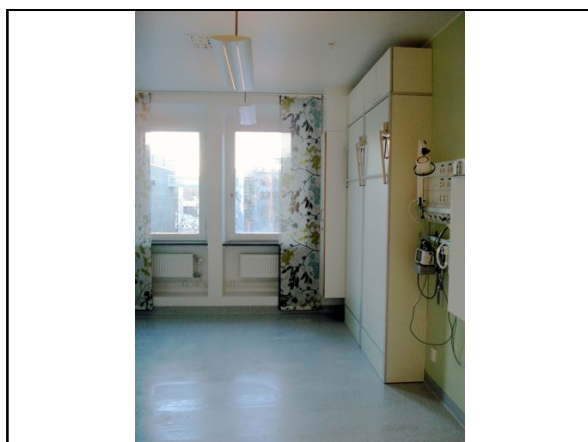
	Solna	Huddinge	Totalt
Allvarliga infektioner	2	1	3
Koloniserade	6	8	14
Totalt	8	9	17





Åtgärder

- Information till personal och föräldrar.
- Kohortvård
- Omfattning av screening och smittspårning.
- Svartsrutiner.
- Empirisk antibiotikabehandling.
- Handhygien hos personal.
- Desinfektion av patientnära tagtyr.
- Användning av handskar och plastförkläde.
- Rengöring och desinfektion av skötbord. Separata skötbord.
- Rengöring och desinfektion av kuvöser.
- Grad av luftfuktighet i kuvöser.
- Utbildning av föräldrar i basala hygienrutiner.
- Föräldrars användning av toaletter och kök.
- Hygienronder.
- Förrådsrutiner.
- Rengöring och desinfektion av mjölkpumpar.
- Rengöring, desinfektion, hantering av mjölkflaskor. Mjölkök



Diskussionspunkter

- Kontinuerliga övervakningsodlingar, Hur? – screeningodlingar, Hur?
- När misstänka utbrott?
- Initial hantering vid utbrott – Checklista?