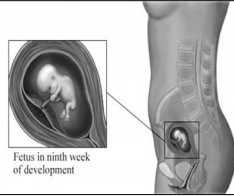


Pregnant Healthcare Workers and Infection Risk
Sotirios Tsiodras, MD, MSc, PhD, University of Athens Medical School
A Webber Training Teleclass

PREGNANT HCW & INFECTION RISK



Sotirios Tsiodras, MD, MSc, PhD
University of Athens Medical School

Hosted by Paul Webber
paul@webbertraining.com
www.webbertraining.com

PREGNANT HCW & INFECTION RISK

- Special concern
 - Certain mild infections
 - May potentially affect fetal development

PREGNANT HCW & INFECTION RISK
Problems

- Risk assessment
 - Detection of infectious agent
 - mode of transmission
 - Type of contact
 - Pregnancy stage
 - Probability of transmission

PREGNANT HCW & INFECTION RISK
Problems

- Risk assessment
 - Personal predisposition to infection
 - **Access to the medical record**
 - Hx of infection
 - Immune status
 - Immunizations

PREGNANT HCW & INFECTION RISK
Problems

- Risk assessment
 - Risk after exposure

PREGNANT HCW & INFECTION RISK
Problems

- Interventions – Response to an incident
 - Hygiene measures
 - Prevention
 - Sharing of info with HCW – discussion
 - Infectious diseases consultation

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PREGNANT HCW & INFECTION RISK Problems

- Response to an incident
 - Laboratory testing
 - Immediate management
 - F/u
 - Seroconversion
 - Probability of transmission to the fetus

EXAMPLES

	Rubella	Parvovirus	Chickenpox
% young women who are susceptible	1 – 2%	40 – 50%	10%
Infectivity risk from household contact	High (90%)	Medium (50%)	High (70 – 90%)
Risk of foetal infection	<11 wks: 90% 11 – 16 wks: 55% >16 wks: 45%	<4 wks: 0% 5 – 16 wks: 15% >16 wks: 25–70%	<28 wks: 5-10% 28-36 wks: 25% >36 wks: 50%
Risk of foetal harm	<11 wks: 90% 11-16 wks: 20% 16-20wks: low, mostly deafness >20 wks: no increase	<20 wks: 9% excess foetal loss, 3% hydrops foetalis, of whom 50% die	Congenital varicella syndrome: <13 wks: 1% 13-20 wks: 2% Neonatal varicella: 4 days before to 2 days after delivery: 20%

EXAMPLES

	Rubella	Parvovirus	Chickenpox
Risk to mother	Arthritis	Arthritis	Pneumonitis: case fatality in pregnancy 1:1000
Interventions and benefits	Termination of pregnancy	Intrauterine transfusion reduces odds of death in hydrops to 0.14	At end of pregnancy: ZIG to mother and neonate attenuates illness. Aciclovir within 24 hrs of rash for mother, and for neonates
Incubation period	14-21 days	13-18 days	14-21 days
Infectivity period in relation to onset of rash	7 days before to 10 days after	10 days before to day of onset	2 days before, until no new spots

PREGNANT HCW & INFECTION RISK Problems

- Intervention
 - Adjust-modification of professional duties
 - Paid leave of absence

PREGNANT HCW & INFECTION RISK Pathogens of special interest

- Cytomegalovirus (CMV)
 - most common cause of congenital infection worldwide
 - 1 every 1000 children in N America
 - 90-95% asymptomatic at birth
 - Hearing loss, effects on vision, cognitive dysfunction

PREGNANT HCW & INFECTION RISK Pathogens of special interest

- Cytomegalovirus (CMV)
 - often transmitted between children
 - asymptomatic
 - 30-60% children aged 1-5 ετών shed virus
 - Urine, saliva
 - **HCW in contact with children**

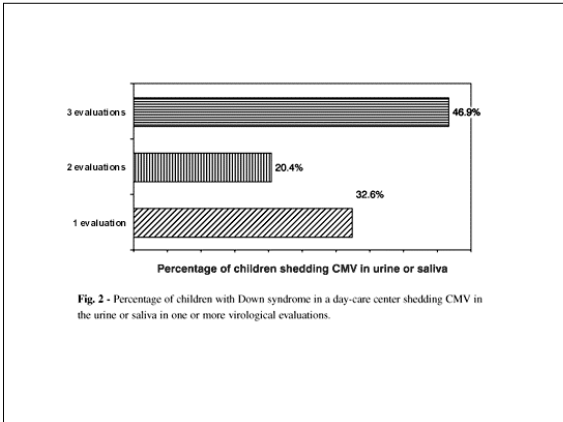
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PREGNANT HCW & INFECTION RISK
 Pathogens of special interest

- **Cytomegalovirus (CMV)**
 - Risk factors for CMV shedding
 - Previous shedding
 - Multiple hospitalizations
 - Female gender
 - Hispanics

Am J Infect Control 1988:41-5



PREGNANT HCW & INFECTION RISK
 Pathogens of special interest

- **Cytomegalovirus (CMV)**
 - NEJM study
 - Shedding in urine/saliva
 - Neonates 1.6 %
 - Premature w hospitalization > 1 month 13 %
 - Community neonates (higher age) 5 %
 - Annual attack rate
 - Med. Students 0.6 %
 - MDs 2.7 %
 - RN 3.3 %
 - Young community females 2.5 - 5.5 %

NEJM, 1983;309:950-3

PREGNANT HCW & INFECTION RISK
 Pathogens of special interest

- **Cytomegalovirus (CMV)**

Transmission	Prevention	Comments
Urine & Resp droplets	<ul style="list-style-type: none"> ● Standard precautions ● Hand hygiene 	<ul style="list-style-type: none"> ● Low risk of nosocomial transmission ● Most adult women already immune

PREGNANT HCW & INFECTION RISK
 Pathogens of special interest

- **Cytomegalovirus (CMV)**
 - in utero infection
 - Primary
 - 25-75% probability of transmission to fetus
 - Reactivation
 - 0.2-2% probability of transmission to fetus

PREGNANT HCW & INFECTION RISK
 Pathogens of special interest

- **Cytomegalovirus (CMV)**
 - good hand-washing
 - All pts- ATTENTION small children !!!
 - NO kisses
 - careful manipulation of potentially CMV contaminated material
 - e.g. diapers

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PREGNANT HCW & INFECTION RISK
 Pathogens of special interest

- Cytomegalovirus (CMV)
 - 44% ob/gyn USA
 - advice for these simple measures

MMWR 2008;57(3):65-8

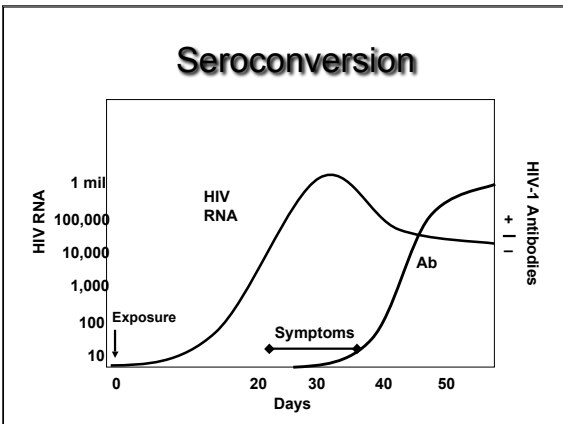
PREGNANT HCW & INFECTION RISK
 Pathogens of special interest

- Cytomegalovirus (CMV)
 - NO transfer to another unit
 - Susceptible HCW
- NO limitation in work in case of an acute infection

PREGNANT HCW & INFECTION RISK
 Pathogens of special interest

- **HIV**

TRANSMISSION	PREVENTION	Comments
Blood & biologic secretions	Standard precaut	<ul style="list-style-type: none"> • Immediate report of ex • No blood donation • No lactation



PREGNANT HCW & INFECTION RISK
 Pathogens of special interest

- **HIV**
 - In theory higher risk of transmission to fetus with 1ry infection
 - In general NO adverse effects of ARV to fetus
 - Most Class B or C

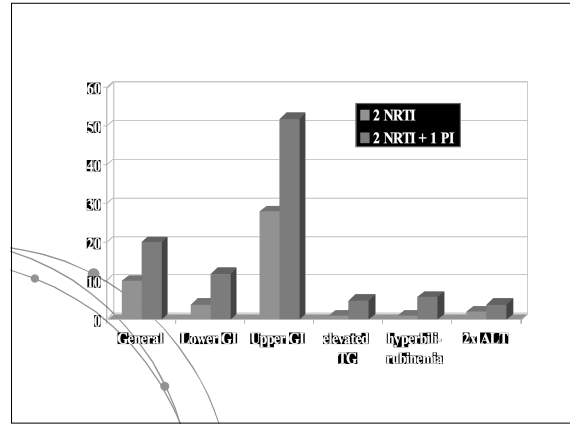
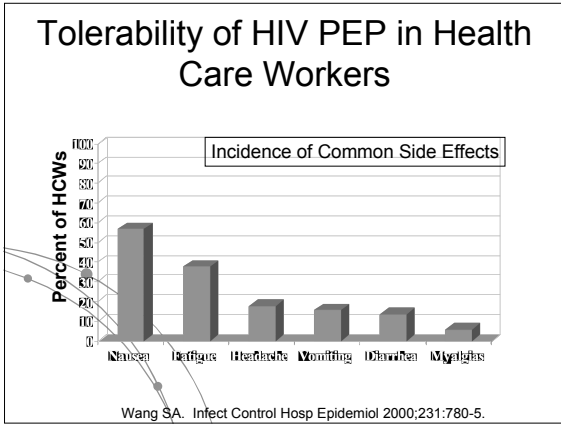
PREGNANT HCW & INFECTION RISK
 Pathogens of special interest

- **HIV**
 - **AVOID USING**
 - Efavirenz
 - D4T + DDI
 - Amprenavir
 - 2^o - 3^o trimester

Lancet 1999;354:1084-9

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PREGNANT HCW & INFECTION RISK

Pathogens of special interest

- Hepatitis A

TRANSMISSION	PREVENTION	Comments
Fecabral	<ul style="list-style-type: none"> • Standard precautions • Available vacc • IVIG 	<ul style="list-style-type: none"> • Complications pregnant • PEP in HCW caring for p during epidemics

Gastroenterology, 2006;1129-34
J Travel Med 2008;15:77-81

PREGNANT HCW & INFECTION RISK

Pathogens of special interest

- Hepatitis A
 - Vaccine over IVIG for age > 40 yrs
 - IVIG over vaccine for age > 40 yrs
 - Also when
 - Immunocompromized
 - Liver dysfxn
 - Contra-indications for immunization

PREGNANT HCW & INFECTION RISK

Pathogens of special interest

- Hepatitis A
 - Nosocomial transmission rare
 - ? Avoid "hands on care" X 7 days
 - After symptom onset
 - Only when disease is symptomatic

PREGNANT HCW & INFECTION RISK

Pathogens of special interest

- Hepatitis B

TRANSMISSION	PREVENTION	Comments
Blood & biological secretions	<ul style="list-style-type: none"> • Standard precau • Available vaccine • HBG 	<ul style="list-style-type: none"> • Vaccine in all HCW exposed biological fluids • Immediate report of expos • Transmission higher in 3rd trimester

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PREGNANT HCW & INFECTION RISK
 Pathogens of special interest

- Hepatitis C

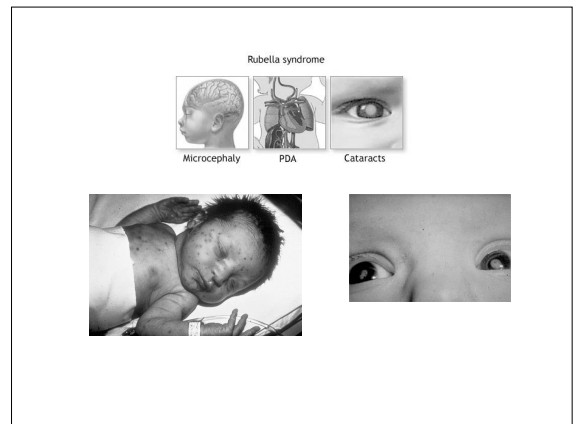
TRANSMISSION	PREVENTION	Comments
Blood & biological secretions	• Standard precautions	• Immediate report of exposure • No work restriction

PREGNANT HCW & INFECTION RISK
 Pathogens of special interest

- Rubella

TRANSMISSION	PREVENTION	Comments
Blood & biological secretions	• Standard precautions • Available vaccine • HBG	• Vaccine in all HCW exposed to biological fluids • Immediate report of exposure • Transmission possibility higher in 3 rd trimester

	Rubella
% young women who are susceptible	1 – 2%
Infectivity risk from household contact	High (90%)
Risk of foetal infection	<11 wks: 90% 11 – 16 wks: 55% >16 wks: 45%
Risk of foetal harm	<11 wks: 90% 11-16 wks: 20% 16-20wks: low, mostly deafness >20 wks: no increase
Risk to mother	Arthritis



PREGNANT HCW & INFECTION RISK
 Pathogens of special interest

- Rubella
 - In theory chance of infection even after immunization

- J Infectious diseases 1974:594-6
- Arch Dis Child 1990:545-6

PREGNANT HCW & INFECTION RISK
 Pathogens of special interest

- Measles

TRANSMISSION	PREVENTION	Comments
• Droplets & Airborne	• Standard precautions • IVIG • ISOLATION	• All HCW should be immune • Nonimmune - no care of measles pts • Immunization only if not pregnant • Work restriction x 21 days

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PREGNANT HCW & INFECTION RISK
Pathogens of special interest

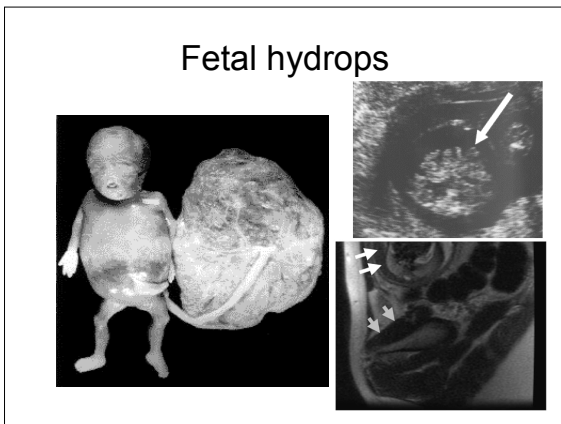
- Human Parvovirus B19

TRANSMISSION	PREVENTION	Comments
• Droplets Resp secretions	• Standard droplet precautions	<ul style="list-style-type: none"> • Good hand hygiene • 50% already immune • Pregnant HCW - nocare of w/ aplastic crisis from B parv

J Publ Health Med 1999;439-36
Pediatrics 1990;85:131-3
AJOG, 2008;e33-34

	Parvovirus
% young women who are susceptible	40 – 50%
Infectivity risk from household contact	Medium (50%)
Risk of foetal infection	<4 wks: 0% 5 – 16 wks: 15% >16 wks: 25–70%
Risk of foetal harm	<20 wks: 9% excess foetal loss, 3% hydrops foetalis, of whom 50% die
Risk to mother	Arthritis

J Infect Dis, 1986;383-93
Clinics in perinatology 1988;273-86



PREGNANT HCW & INFECTION RISK
Pathogens of special interest

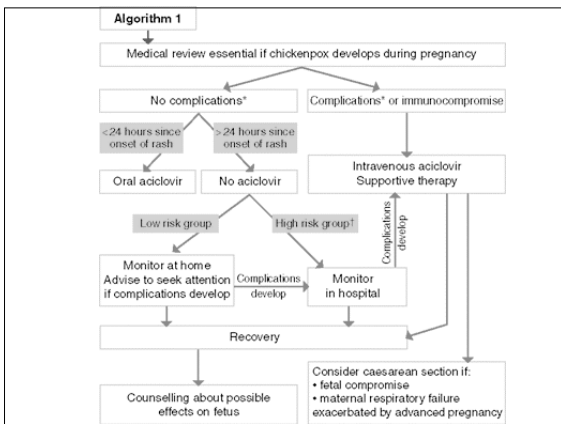
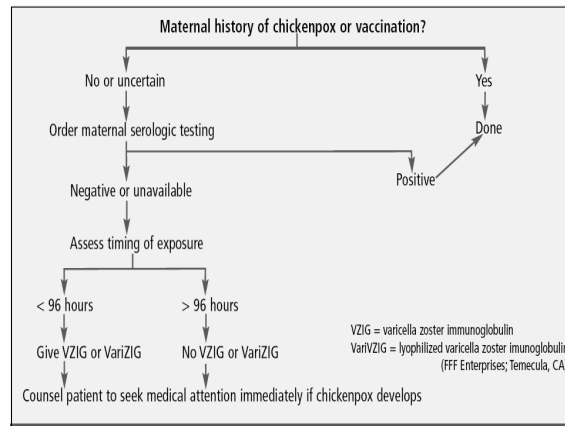
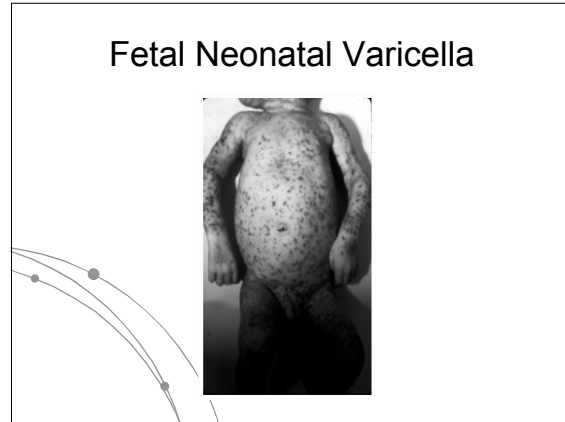
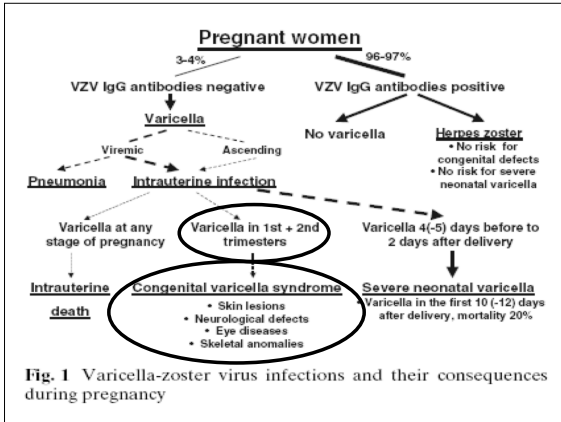
- Varicella
 - Rare during pregnancy
 - 3-4% women at risk
 - Incidence 0.7-3/1000 births

Obstet Gynecol 1991;1112-6
J Infect 1998;59-71

	Chickenpox
% young women who are susceptible	10%
Infectivity risk from household contact	High (70 – 90%)
Risk of foetal infection	<28 wks: 5-10% 28-36 wks: 25% >36 wks: 50%
Risk of foetal harm	Congenital varicella syndrome: <13 wks: 1% 13-20 wks: 2% Neonatal varicella: 4 days before to 2 days after delivery: 20%
Risk to mother	Pneumonitis: case fatality in pregnancy 1:1000

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PREGNANT HCW & INFECTION RISK

Pathogens of special interest

- Varicella

TRANSMISSION	PREVENTION	Comments
<ul style="list-style-type: none"> • Contact • Airborne 	<ul style="list-style-type: none"> • Standard • Airborne • VZIG • ISOLATION 	<ul style="list-style-type: none"> • All HCW should be immune • Nonimmune-nocare & ZVpts • Vaccinate non pregnant HCW • Vaccinate family if non-imm susceptible pregnant HCW

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PREGNANT HCW & INFECTION RISK
Pathogens of special interest

- Influenza

"Woe unto Them that are with Child",
Johnson, Lancet 1919

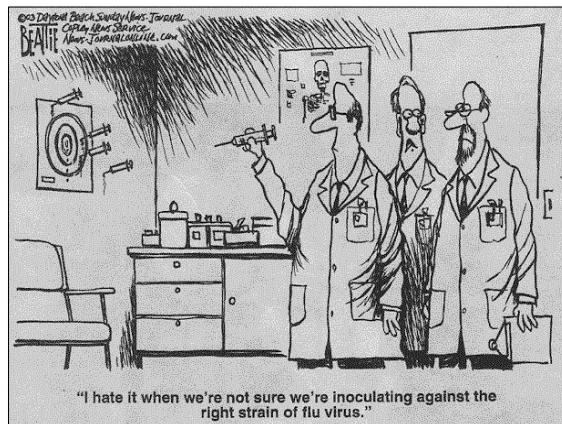
PREGNANT HCW & INFECTION RISK
Pathogens of special interest

- Influenza
- 1,350 cases of influenza in pregnant
 - 1918 pandemic
 - 27% death (Harris, JAMA 1919).
- 86 pregnant women hosp for flu
 - Chicago 1918
 - 45% death (Nuzum. JAMA 1918).

PREGNANT HCW & INFECTION RISK
Pathogens of special interest

- Influenza

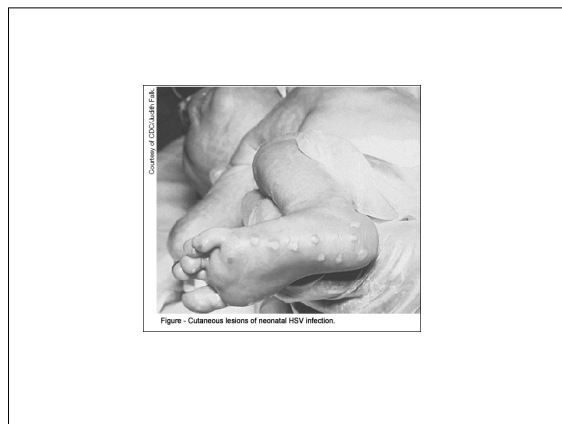
TRANSMISSION	PREVENTION	Comments
<ul style="list-style-type: none"> • Large droplets • Respiratory secretions 	<ul style="list-style-type: none"> • Standard Droplet • Antiviral • Vaccination 	<ul style="list-style-type: none"> • Respiratory hygiene and cough etiquette • Immunize all HCW • Vaccinate pregnant HCW independent of trimester • No LAIV • No amantadine or rimantadine



PREGNANT HCW & INFECTION RISK
Pathogens of special interest

- HSV

TRANSMISSION	PREVENTION	Comments
<ul style="list-style-type: none"> • Contact with lesion 	<ul style="list-style-type: none"> • Contact 	<ul style="list-style-type: none"> • Rare nosocomial transmission in pregnant HCW



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PREGNANT HCW & INFECTION RISK
 Pathogens of special interest

- MDR pathogens

TRANSMISSION	PREVENTION	Comments
<ul style="list-style-type: none"> ● Depend on focus of infxn or colonizatio 	<ul style="list-style-type: none"> ● Standard Contact 	<ul style="list-style-type: none"> ● Risk same for pregnant and nonpregnant HCW

PREGNANT HCW & INFECTION RISK
 Pathogens of special interest

- Tuberculosis

TRANSMISSION	PREVENTION	Comments
<ul style="list-style-type: none"> ● Airborne 	<ul style="list-style-type: none"> ● Airborne 	<ul style="list-style-type: none"> ● Report HCW exposure in pregnant HCW ● PPD not contraindicated ● INH after 1st trimester

PREGNANT HCW & INFECTION RISK
 Pathogens of special interest

- RSV
 - Pregnant or nursing HCW should not care
 - for pt treated w aerosolized ribavirin

PREGNANT HCW & INFECTION RISK
 Pathogens of special interest

- N. meningitidis
 - Ceftriaxone
 - 250 mg im X 1
 - Only prophylaxis allowed for pregnant HCW

Relevant legislation

- European Union Council Directive 1992¹
- Employment Protection (Consolidation) Act 1978²
- Management of Health and Safety at Work Regulations 1999³
- The Employment Rights Act 1996⁴
- Ionising Radiations Regulations 1999⁷
- Manual Handling Operations Regulations 1992⁹
- Control of Substances Hazardous to Health Regulations 1994¹¹
- Workplace (Health, Safety and Welfare) Regulations 1992¹²
- Maternity Rights. A Guide for Employers and Employees 2002¹³

PREGNANT HCW & INFECTION RISK

The management of risk of infection associated with employment needs to be a partnership between the employee, occupational health, the employer and the hospital or trust infection control organisation. Advice may be required from the hospital microbiology department or department of infectious diseases. A comprehensive written policy is recommended to include aspects of risk assessment, educational needs for employees and managers, together with individual case management strategies.

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Conclusions

- Certain immunizations required
 - π.χ. rubella, varicella, HepB, annual flu
- Quick exposure report
- Job restrictions rarely required
 - e.g. Parvovirus B19, varicella, aerosolized ribavirin
- Need for written policy for pregnant HCW

THANK YOU !!!



THE NEXT FEW TELECLASSES

29 May. 09	Surgical Site Infections – A 2009 Update Speaker: Loretta Litz Fauerbach, Shands Hospital, University of Florida
04 Jun. 09	Portal of Entry: The Missing Link? Speaker: Jim Gauthier, Providence Continuing Care, Kingston
24 Jun. 09	(South Pacific Teleclass) Tea Tree Oil and Staphylococcal Sepsis Speaker: Prof. Tom Riley, University of Western Australia
16 Jul. 09	(Free Teleclass) ProMED and the Use of Informal Information Sources for Emerging Disease Surveillance Speaker: Dr. Larry Madoff, ProMED Editor, Harvard Medical School
21 Jul. 09	(Free British Teleclass) Fitness for Purpose in Infection Control Speaker: Martin Kiernan, Southport and Ormskirk NHS Trust/View
06 Aug. 09	(Free Teleclass) How Professional Associations Can Best Contribute to Infection Prevention Globally Speaker: Dr. Cathryn Murphy, Bond University

www.webbertraining.com.schedulep1.php

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