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Strategies for Reducing Low Birth Weight and Infant Mortality in the U.S.

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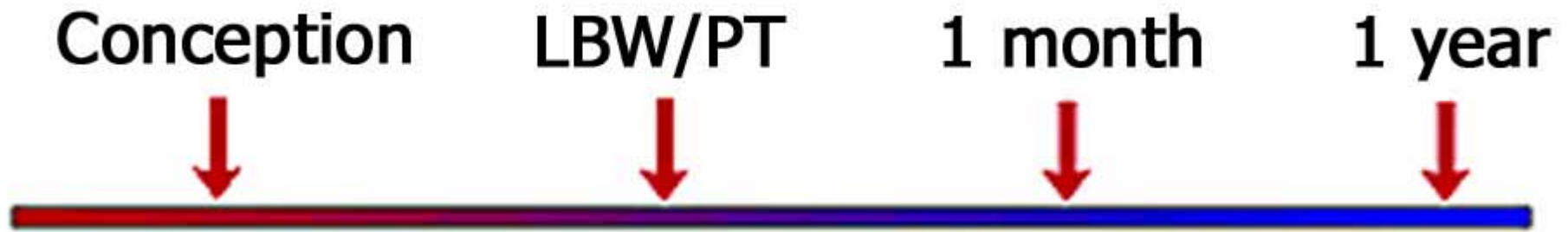
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Section A

Introduction and Strategies to Prevent High Risk Pregnancies

Conceptual Timeline

- Keep this timeline of key intervention points in mind as we go through the lecture



- IMRs are a function of the **distribution of risk factors** and **risk specific mortality rates**
- Birth weight is the strongest predictor of IM; IMR improvements are likely to result from reductions in LBW rates
- Some causes of IM will not be reduced by interventions focusing on LBW or pre-term births alone

Four Strategies for the Reduction of Infant Mortality

- Reducing the proportion of high-risk pregnancies
- Reducing the incidence of LBW and pre-term births by improving the health care and health behaviors of women
- Improving birth weight specific survival by strengthening obstetric and neonatal health systems

Four Strategies for the Reduction of Infant Mortality

- Reducing death from specific causes, such as sudden infant death syndrome (SIDS) during the post neonatal period

Anticipated Reduction Graph

Summary of anticipated reductions in IMR from selected interventions

Intervention	Estimated IMR	Estimated Deaths Averted	% Decline in IMR
Baseline	14.48	0	0
Unwanted Births	14.14	90	2.3
Birth Interval	14.07	109	2.3
Teen Births	14.34	37	0.9
Comprehensive PNC	12.61	501	12.8
Smoking cess.	14.34	37	0.9
Nutrition	14.18	79	2.0
Regionalization	12.64	495	12.7
Surfactant	13.94	142	3.6
SIDS	13.93	146	3.7

Strategies to Prevent High Risk Pregnancies

- Family planning
- Genetic counseling

Family Planning Strategies

- Family planning strategies reduce the incidence of high risk pregnancies by ...
 - Reducing unwanted births (especially in older women)
 - Reducing closely spaced births
 - Reducing births to teenage mothers

- Majority of women who have congenital anomalies are low risk
- Limited impact on overall IMR

Preconception Counseling

- Importance of preconception counseling
 - Risk factors defined prior to pregnancy
 - Effective in women with diabetes



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Section B

Strategies to Prevent LBW and Pre-Term Births in a Population

Strategies to Prevent LBW and Pre-Term Births in a Population

- Routine prenatal care
- Comprehensive prenatal care
- Psychosocial interventions
- Health promotion

Strategies to Prevent LBW and Pre-Term Births in a Population

- Pre-term birth prevention programs
- Case management/coordination
- Outreach

Routine Prenatal Care

- Historical influence
 - 1980s—heralded as panacea
 - Originally implemented to reduce maternal morbidity and mortality
- Focuses largely on identification and prevention of pregnancy complications
- Mixed results
 - Confounded with self-selection for care and other healthy behaviors

Comprehensive Prenatal Care

- Includes routine medical/clinical plus
 - Social/psychosocial services
 - Nutrition services
 - Health education/health promotion
 - High-risk referral when necessary
- Emphasis on problems more common to low-income women

USDHHS Recommendations

- Comprehensive care
- Front loading of care
- Psychosocial component
- Health promotion
 - Health habits and behaviors
- Fewer prenatal visits needed for low-risk women

- Effective for improving birth weight for adolescents
- Quasi-experimental
 - Lower LBW rates for low-income women
- Two clinical trials
 - First, higher mean birth weight among primigravida women
 - Second, no effect

- Unclear which components of care are effective
 - Which part of package?
- Studies have generally evaluated the effect of these programs on LBW

Psychosocial Interventions

- Most studies of social support on birth outcome
- No effect on length of pregnancy
- Women perceived overall care to be better than women without support

Psychosocial Interventions

- How much of birth weight variation is due to social and emotional problems?
- Will not result in significant changes on population level

- No or small improvements in birth weight associated with social supports in RCT
 - Exception—one recent small RCT, women with inadequate support
 - Interventions focus on support by nurses, social workers, or lay resource workers
 - Virtually no trials identify personal sources of support for the mother

- Heavy emphasis of DHHS panel report
- Often focus on smoking reduction and substance abuse programs
- Counseling about smoking and substance use during pregnancy is a routine component of public programs
- Coordination of services for women who abuse substances and substance abuse treatment

- Modest improvements in birth weight associated with smoking cessation programs
- Substance use results not yet available
 - Likely to have only small effects on a population basis
 - Appear to have important effects on the health of women

- Even if program is 100% effective, smokers are only a small percentage of the population
- The effects are not large

History

- 1st program—Emile Papiernik in France
- Creasy and colleagues adopted Papiernik's ideas
 - Empirically evaluated the risk assessment instrument
 - Evaluated the program in N. California hospital using a pre-test/post-test historical control design

Pre-Term Birth Prevention Program Characteristics

- Risk assessment of all patients using a standardized instrument
- Education of providers about signs and symptoms of pre-term labor
- Risk assessment at two points in time
 - First prenatal visit
 - Between 26–28 weeks of pregnancy (with some variation)

Pre-Term Birth Prevention Program Characteristics

- Education of high risk women about signs and symptoms of pre-term labor, what to do if symptoms occur
- Cervical exam usually at the start of the third trimester—gentle palpation of cervical effacement and dilation
- Use of tocolytic drugs, where appropriate

Pre-Term Birth Prevention Program Results

- Results of programs are mixed
 - Early observational studies indicated a positive impact among middle class populations
 - The clinical studies which examined the effects on low income women, showed no impact

Pre-Term Birth Prevention Program Results

- Possible explanations for mixed results
 - Since 60% of women who deliver pre-term are NOT labeled high risk, programs missing the majority of women with pre-term deliveries
 - Some pre-term deliveries are intended
 - Tocolytic drugs not very effective

Case Management/Case Coordination

- Designation of an individual who is responsible for coordinating services to be provided to pregnant women
- May or may not include an extensive psychosocial assessment
- Most commonly provided to low income women by nurses and less frequently by social workers

Case Management/Case Coordination

- Focus of many Medicaid expansions for pregnancy women
- “Care coordination”/ “case management” have competing purposes:
 - Care coordination—to coordinate the health care needs of women and to assure they receive needed services
 - Case management—To be a gate-keeper, to approve necessary care

- Results of programs
 - Little evaluation of case management for pregnant women
 - Although a few recent studies suggest positive effects

- Many forms of outreach
 - Activities to get women into care and keep them in care
 - Social marketing
 - Support through home visiting and providing assistance in getting needed services
 - May include transportation, payment for transportation, and incentives

- Results of programs
 - Studies suggest that outreach is generally not a cost-effective strategy for improving pregnancy outcomes
 - Due in part to the fact that more high risk women are brought into care
 - Underestimates the profound effect it may have on an individual woman



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Section C

Strategies to Improve: Birth Weight-Specific Mortality

Strategies to Improve Birth-Weight-Specific Mortality

- Regionalization of prenatal care
- New treatments for VLBW infants

Regionalization of PNC

- Based on the premise that pregnant women and newborns with given risk factors should receive their care from an appropriate level facility
- Coordinated system of linkages between these different care sites, so a woman or neonate in need of a certain level of care is efficiently and appropriately provided with that care

Regionalization of PNC

- Systems of regionalized care are organized into a hierarchy of care
- *Level I Institutions* (primary care)
 - Care to low risk women
- *Level II Institutions* (specialty/intermediary care)
 - Care to moderate risk women and limited neonatal care

- *Level III Institutions* (subspecialty/tertiary care)
 - Care to women with extreme complications and state-of-the-art neonatal care
 - May include higher level facilities that function as regional centers

Coordination of Care

- Coordination of care implies
 - Risk assessment at care site
 - Referral mechanisms to appropriate level of care
 - Transportation to subspecialty care
 - Communication between providers
 - Education of primary care providers and patients

Effect of PNC Regionalization

- No direct evidence that regionalization actually works
- Data which suggest it is effective comes from pre-test/post-test evaluations
- Evidence that VLBW babies born in tertiary centers have better outcomes

Regionalization of PNC

- Managed care as potential threat regionalization
- Deregionalization of care could be detrimental for the following reasons:
 - Supporting services may not be available at Level II with NICUs
 - May not be high risk follow-up
 - Fragmentation of care may result

New Treatment of VLBW Infants: Surfactant Therapy

- Surfactant therapy credited with reductions in infant mortality in 1989–91 from Respiratory Distress Syndrome (RDS)
- Not clear if effective in reducing morbidity
- Clinical trials show evidence of reducing mortality rates in VLBW



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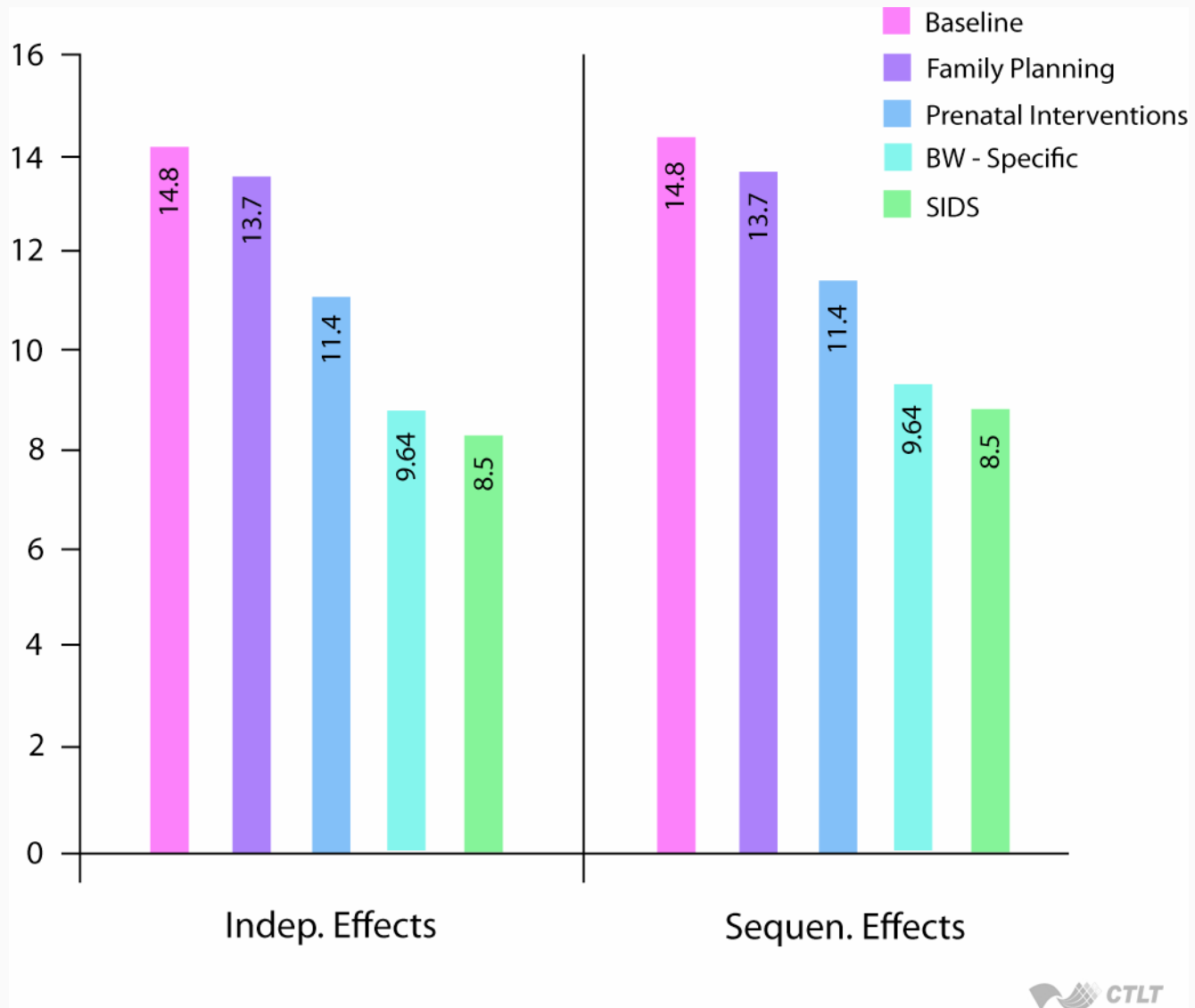
Section D

Strategies to Reduce Postneonatal Mortality and Lecture
Conclusion

- 1992 the American Association of Pediatrics (AAP) recommended that babies should be placed to sleep in supine position
 - Based on results of several case-control studies showing that babies in prone position were more likely to die from SIDS than babies who were placed in supine (OR's 2-4)

- Recent evidence in Europe shows decline in SIDS due to change in sleep position
- U.S. death rates from SIDS declined significantly with pediatrician recommendations and education campaigns to place infants in supine
- A major focus of many Fetal and Infant Mortality Review Programs (FIMR)

“Reducing IM through Medical Interventions”



Conclusions

- Multi-factorial etiology of IM
- Effects of interventions on total population
- Combination of interventions is likely to be most successful