

Slide 1

Abnormal Labor

John Buckmaster MD

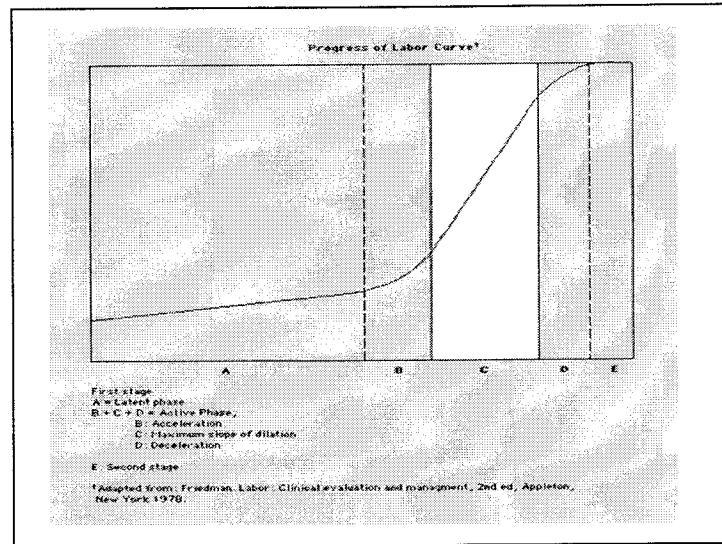
Leonardo Pereira MD

Slide 2

Definition of Labor

- Uterine contractions accompanied by progressive dilation and effacement of the cervix with descent and expulsion of the fetus.
- Labor divided into 3 stages, 1st 2nd and 3rd. (Friedman EA, 1978)

Slide 3



Slide 4

First Stage

- Can be subdivided into *latent and active* phases of the 1st stage.
- Maximum normal latent phase is 20 hours for nullipara, 14 hours for multipara.

Slide 5

2nd Stage

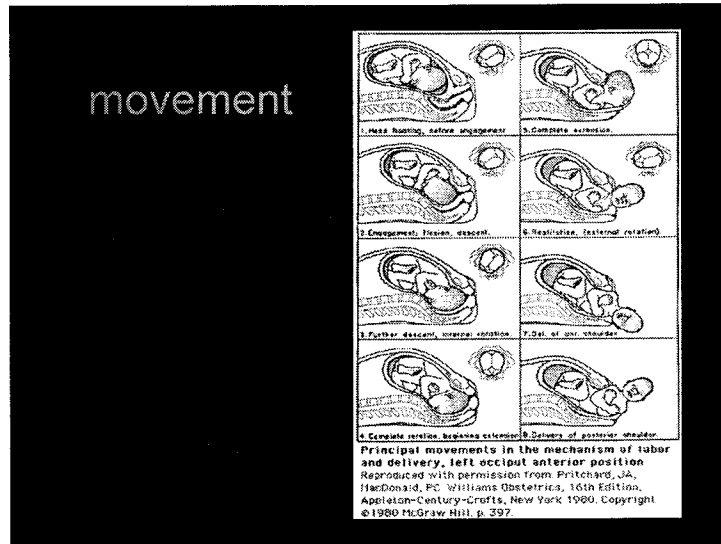
- The second stage of labor refers to the interval between full cervical dilatation (10 cm) and delivery of the infant. It is characterized by descent of the presenting part through the maternal pelvis and culminates with expulsion of the fetus.
- Indications that the second stage has started are an increase in bloody show, maternal desire to bear down with each contraction, a feeling of pressure on the rectum accompanied by the desire to defecate, and onset of nausea and vomiting.

Slide 6

3rd Stage

- **Third stage** — The third stage of labor refers to the time from delivery of the baby to separation and expulsion of the placenta. The major complication associated with this period is hemorrhage, which remains an important cause of maternal morbidity and mortality. There are no uniform criteria for the normal length of the third stage of labor. Retention of the placenta for longer than 30 minutes at term is a commonly used endpoint for intervention.

Slide 7



Slide 8

Diagnostic Criteria for Abnormal Patterns in Active Labor*

First stage		
Labor pattern	Nullipara	Multipara
Duration	24.7 hours	18.8 hours
Protracted dilation	<1.2 cm/h	<1.5 cm/h
Arrested dilation	>2 h	>2 h
Second stage		
Labor pattern	Nullipara	Multipara
Arrest of descent (epidural)	>3 h	>2 h
Arrest of descent (no epidural)	>2 h	>1 h

* Values represent approximately two standard deviations from the mean

Slide 9

Abnormal Labor Importance

Indications for primary CD in US

54% dystocia

20% malpresentation

13% FHR abnormalities

Slide 10

Terminology

- Protraction disorders refer to slower-than-normal labor progress
- Arrest disorders refer to complete cessation of progress.

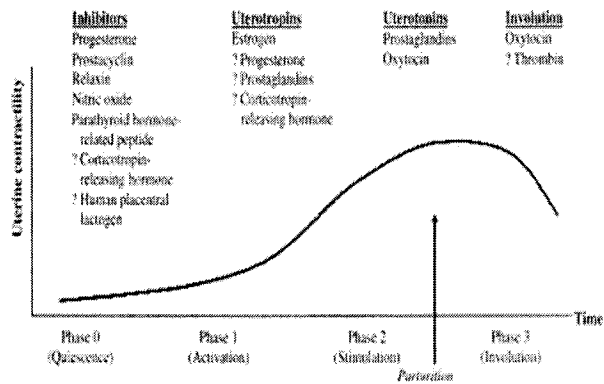
Slide 11

Etiology of Abn labor

Abnormal labor can be the result of one or more abnormalities of the cervix, uterus, maternal pelvis, or fetus (ie, power, passenger, or pelvis).

Slide 12








Control of uterine activity



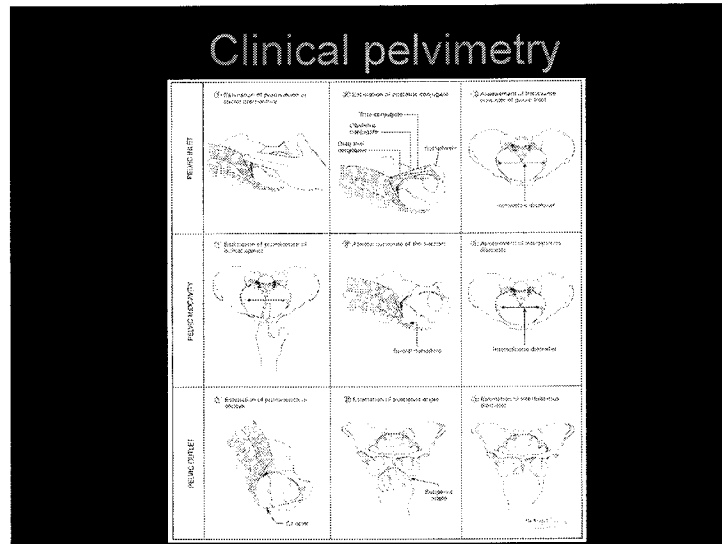
Power, Montevideo units

Montevideo units (calculated by multiplying the average peak strength of contractions in mm Hg by the number of contractions in 10 minutes) is the most widely used calculation for measuring the strength of uterine contractions

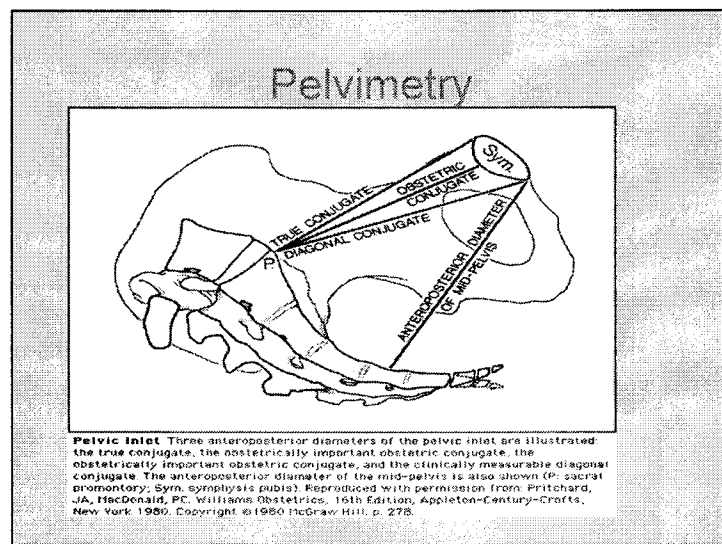
Types of female pelvis

		 Gynecoid	 Anthropoid	 Android	 Platypelloid
	Widest transverse diameter of inlet	12 cm	< 12 cm	12 cm	12 cm
	Anteroposterior diameter of inlet	11 cm	> 12 cm	11 cm	10 cm
	Forepelvis	Wide	Divergent	Narrow	Straight
	Side walls	Straight	Narrow	Convergent	Wide
	Sacrosciatic notch	Medium	Backward	Narrow	Forward
	Inclination of sacrum	Medium	Wide	Forward (lower third)	Narrow
	Ischial spines	Not prominent	Not prominent	Not prominent	Not prominent
	Subpubic arch	Wide	Medium	Narrow	Wide
	Transverse diameter of outlet	10 cm	10 cm	< 10 cm	10 cm

Slide 15

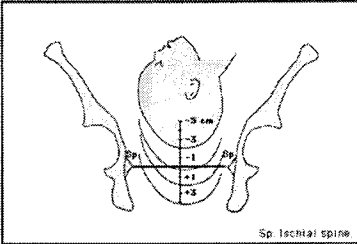


Slide 16



Slide 17

Station

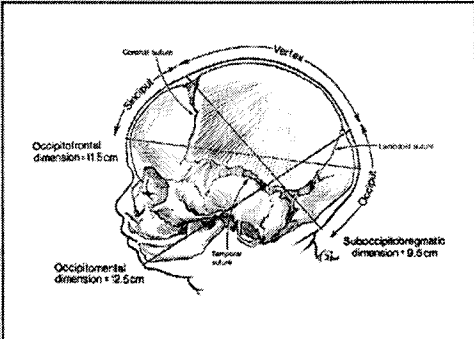


The diagram shows a cross-section of the pelvic inlet with the fetal head positioned above the ischial spines. A vertical scale on the right indicates station levels: +3.4 cm, -5, -1, +1, and +3. The fetal head is positioned at the -2 level, which is two centimeters above the ischial spines. The label 'Sp. ischial spine' is located at the bottom right of the diagram.

Assessing descent of the fetal head by vaginal examination The fetus is at -2 station signifying that the leading edge of the presenting part is two centimeters above the ischial spines.

Slide 18

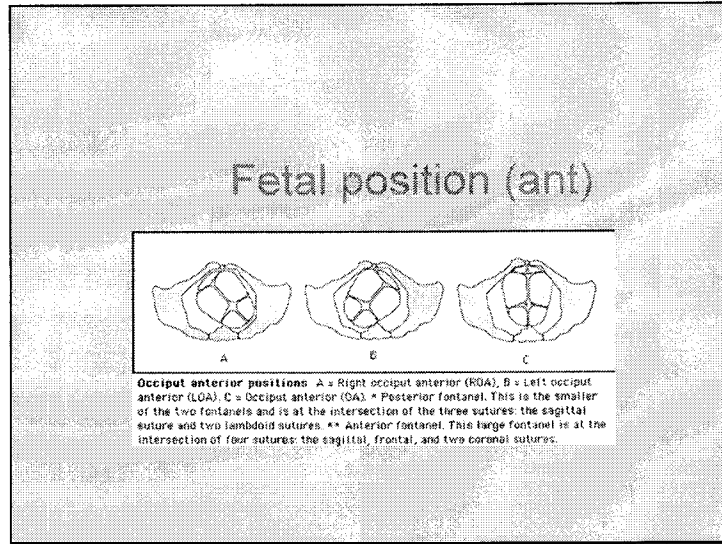
Diameters of fetal head



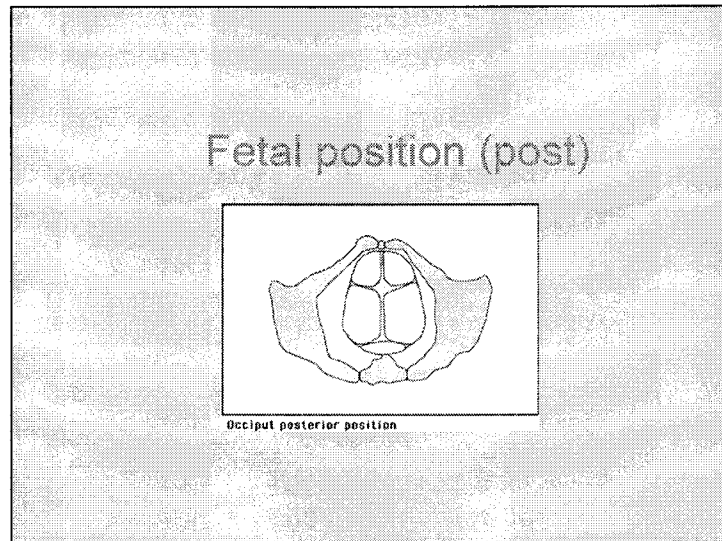
The diagram illustrates the fetal head with several key diameters labeled: Occipitofrontal dimension = 11.5 cm, Occipitomental dimension = 12.5 cm, Suboccipitobregmatic dimension = 9.5 cm, and Occipitoparietal dimension = 10.5 cm. Other anatomical features labeled include the coronal suture, vertex, lambdoid suture, and temporal suture.

Diameters of the fetal head at term Reproduced with permission from Pritchard, JA, MacDonald, PC. Williams Obstetrics, 15th Edition, Appleton-Century-Crofts, New York, 1980. Copyright © 1980 McGraw Hill, p. 177

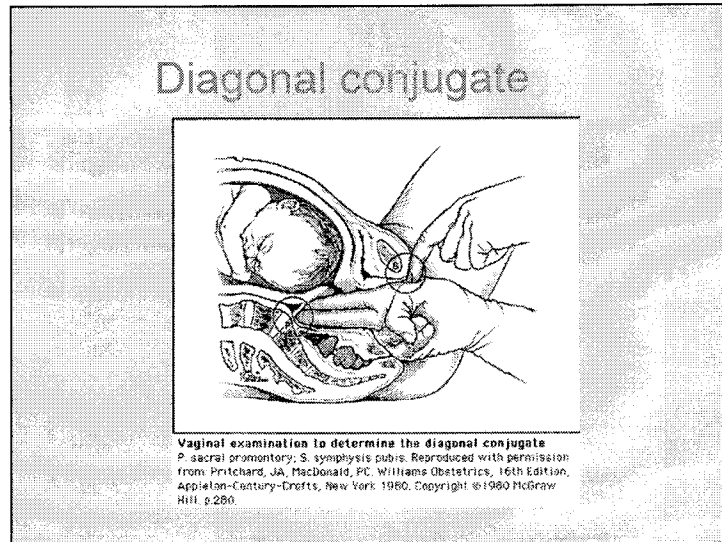
Slide 19



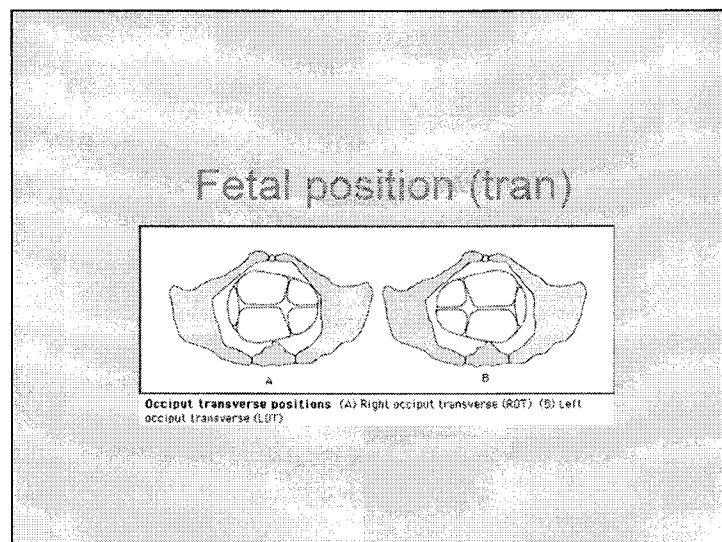
Slide 20



Slide 21



Slide 22



Slide 23

Duration of labor - Nulliparas		
Progression of spontaneous labor at term		
Parameter	Mean	5 th percentile
Nulliparas		
Total duration of labor (hours)	10.1 h	25.8 h
Stage of labor		
Duration of the first stage (hours)	9.7 h	24.7 h
Duration of the second stage (minutes)	33.0 min	117.5 min
Duration of latent phase (hours)	6.4 h	20.6 h
Rate of dilatation during active phase (cm/h)	3.0 cm/h	1.2 cm/h
Duration of the third stage (minutes)	5.0 min	30.0 min

Slide 24

Duration of labor - Multiparas		
Progression of spontaneous labor at term		
Parameter	Mean	5 th percentile
Multiparas		
Total duration of labor (hours)	6.2 h	19.5 h
Stage of labor		
Duration of the first stage (hours)	8.0 h	18.8 h
Duration of the second stage (minutes)	8.5 min	46.5 min
Duration of latent phase (hours)	4.8 h	13.6 h
Rate of dilatation during active phase (cm/h)	5.7 cm/h	1.5 cm/h
Duration of the third stage (minutes)	5.0 min	30.0 min

Slide 25

Latent phase – management of prolonged latent phase

- Avoid early admission to the labor and deliver unit. Admit only if cervix ≥ 3 cm dilated or 100% effaced. Before labor, during prenatal care, counsel the patient appropriately regarding the benefits of this approach. (Level A-1)
- Diagnosis of a prolonged latent phase is subjective, but can be based on Friedman's criteria (≥ 20 hours in nulliparas and 14 hours in multiparas between onset of labor and active phase).
- Evaluate patients individually to assess their level of fatigue and need for support. (Level C-III)
- If the mother is doing well and there is a reassuring fetal status, keep patients at home as long as possible and encourage adequate fluid intake and small frequent meals. Have the patient return if there is bloody show or membrane rupture or a perceived change in the strength or frequency of contractions. Even if there is no change in the patient's symptoms, set a specific time to periodically re-evaluate the patient's status. (Level C-III)
- For those patients who need rest, a sleep medication (zolpidem, 5–10 mg orally) may be given to take at home, or they may be admitted for morphine sedation (15–20 mg). (Level C-III)
- If the patient's cervix is ≥ 3 cm or 100% effaced, offer admission with active management. Oxytocin should be started and titrated to achieve contractions every 2 to 3 minutes. Early amniotomy is optional, either with oxytocin or as an alternative to oxytocin. Amniotomy is usually best delayed until cervix is ≥ 2 cm dilated and station is ≤ 2 , especially if the vertex is not well applied to the cervix. (Level B-1)

Slide 26

1st stage, active phase

Management of active phase disorders

- Cervix must be at least 4 cm dilated to diagnose active phase disorder (Level A II-3)
- Oxytocin to achieve three to five contractions every 10 minutes, or contractions every 2 to 3 minutes (Level A II-1)
- Option of intrauterine pressure catheter to document adequate strength of contractions, which is defined as 200 Montevideo units for at least 2 hours (Level B II-2)
- Amniotomy should be performed if rupture of membranes has not already occurred, before entertaining the diagnosis of failure to progress (Level B III)
- At least 4 hours of adequate contractions, as defined by the frequency described previously, of which at least 2 hours with adequate intrauterine pressure catheter-proved strength, must elapse before abnormal active phase progression is entertained (Level A I)
- Even after 4 hours of abnormal progression, active labor (in a nullipara with no uterine scars) can be continued up to 6 to 8 hours with good chances of vaginal delivery as long as fetal monitoring is reassuring and there is evidence of some progress (Level A-1)

Reducing dystocia

Intrapartum strategies to reduce the risk of dystocia

SHOWN TO DECREASE RISK

- Continuous support (Level A I)
- Maternal erect position (Level B I)
- Judicious use of regional anesthesia (Level B I)
- Adequate hydration (Level B I)

NOT SHOWN TO DECREASE RISK

- Ambulation (Level A I)

2nd stage, management

Management of second stage

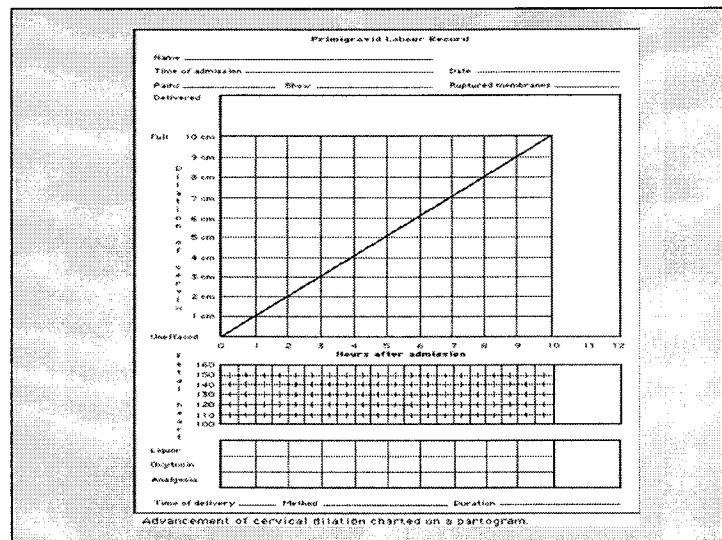
- Allow adequate time. Conservative suggestions are:
In nulliparas: 3 hours with epidural, 2 hours without an epidural
In multiparas: 2 hours with epidural, 1 hour without an epidural
If there are no signs of infection (maternal or fetal), no maternal exhaustion, and reassuring fetal testing, labor can be allowed to continue beyond these limits as long as some progress has been made. (Level B II-3)
- Pushing should start as soon as complete dilatation has been detected, unless the fetus is malpositioned (eg, occiput posterior), or the epidural so dense that the woman has no urge to push. (Level B I)
- Delayed pushing has been associated with longer second stage, with the consequent increased maternal and fetal-neonatal infection risk, and with lower neonatal pH. The laboring patient who opts for delayed pushing should be made aware of these risks. (Level B I)

Slide 29

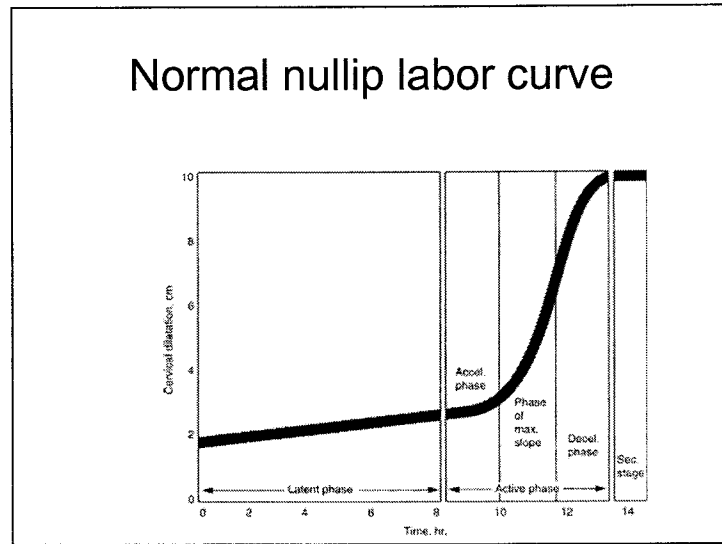
Active management

Intervention	Goal
Rigid inclusion criteria	Ensure only term, uncomplicated nulliparas are actively managed
Strict diagnosis of labor	Prevent admission in latent labor, decrease duration of labor experienced in hospital, possibly decrease cesarean rate
Early amniotomy	Assess volume and presence of meconium as signs of fetal distress
Frequent cervical examinations	Ensure adequate progress, detect first-stage dystocia
High-dose oxytocin	Correct dystocia by achieving more efficient uterine activity

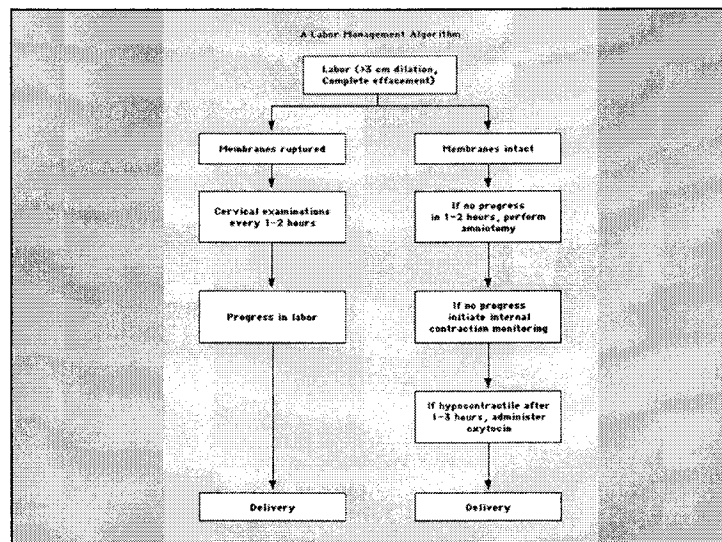
Slide 30



Slide 31



Slide 32



Examples of Oxytocin Infusion Protocols

Regimen	Starting dose mU/min	Incremental increase, mU/min	Dosage interval, minutes
Low-dose	0.5 to 1.0	1	30 to 40
Alternative low-dose	1-2	2	15
High-dose	6	8 Maximum: 40 mU	15
Alternative high-dose	4	4 Maximum: 32 mU	15

Effect of Epidural

Labor	Epidural	Meperidine	p value
Cervical dilation	4.1 cm	4.2 cm	NS
Active phase	7.9 hr	6.3 hr	.005
Second stage	60 min	48 min	.03
Fetal Descent	4.2 cm/hr	7.9 cm/hr	.003

Slide 35

Effect of Walking - Nulliparous

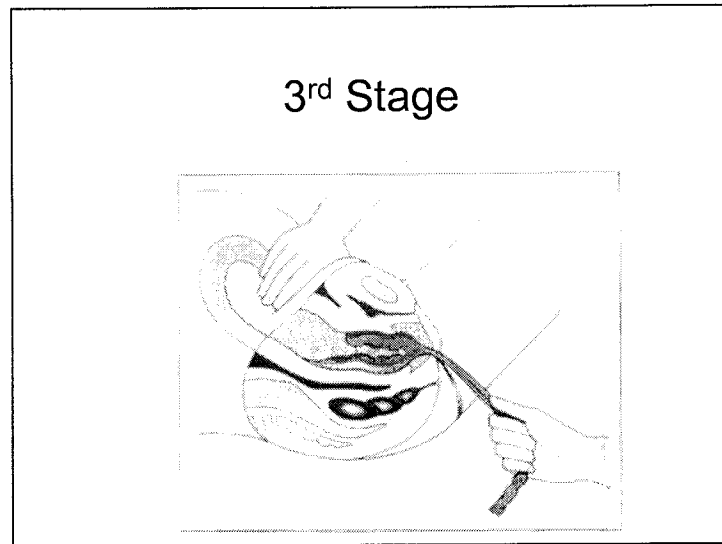
Outcome	Walking Group	Usual Care group	p value
Labor, hr			
First Stage	7.6 ± 3.9	7.3 ± 3.9	0.47
Second Stage	1.0 ± 0.9	0.9 ± 0.8	0.46
Labor – no (%) augmentation	95 (35)	99 (36)	0.72
Forceps –no (%) delivery	21 (8)	15 (6)	0.30
Cesarean Birth - no (%)	19 (7)	21 (8)	0.74

Slide 36

Effect of Walking - Multiparous

Outcome	Walking Group	Usual Care group	p value
Labor, hr			
First Stage	4.6 ± 2.4	4.7 ± 2.4	0.60
Second Stage	0.2 ± 0.3	0.2 ± 0.3	0.42
Labor – no (%) augmentation	27 (10)	38 (15)	0.12
Forceps –no (%) Delivery	2 (1)	2 (1)	0.99
Cesarean Birth - no (%)	4 (2)	10 (4)	0.10

Slide 37



Slide 38

Benefit of EFM

Meta-analysis of intrapartum fetal assessment by intermittent auscultation versus electronic fetal heart rate monitoring

Outcome	Studies	Participants	Relative risk (fixed) 95% CI	Effect
Cesarean delivery	10	18792	1.41 (1.23-1.61)	Increase
Operative vaginal delivery	9	18546	1.20 (1.11-1.30)	Increase
Apgar-1<7	9	18681	1.04 (0.93-1.17)	Nil
Apgar-1<4	9	18444	0.90 (0.72-1.11)	Nil
Neonatal seizures	10	18927	0.51 (0.32-0.82)	Reduction
NICU admissions	9	18681	1.00 (0.92-1.09)	Nil
Perinatal death	10	18927	0.89 (0.60-1.33)	Nil
Cerebral palsy	2	13325	1.66 (0.92-3)	Nil

Data from Thacker SB, Stroup D, Chang M. Continuous electronic heart rate monitoring for fetal assessment during labor (Cochrane Review). In: The Cochrane Library, Issue 3. Chichester, UK: John Wiley & Sons; 2004