Dr. Shohre Movahedi

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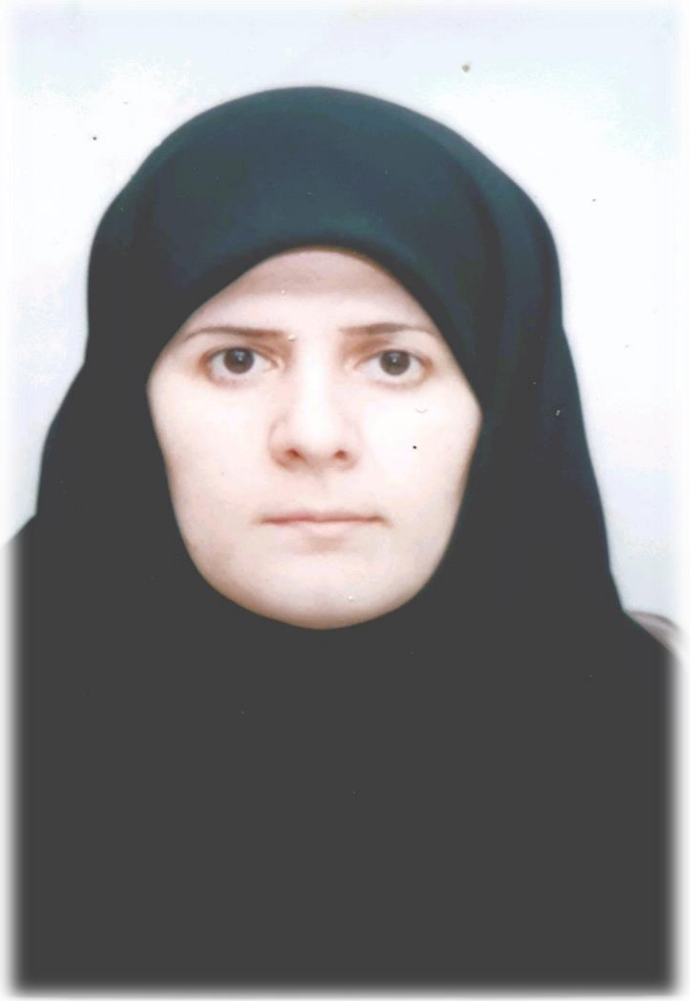
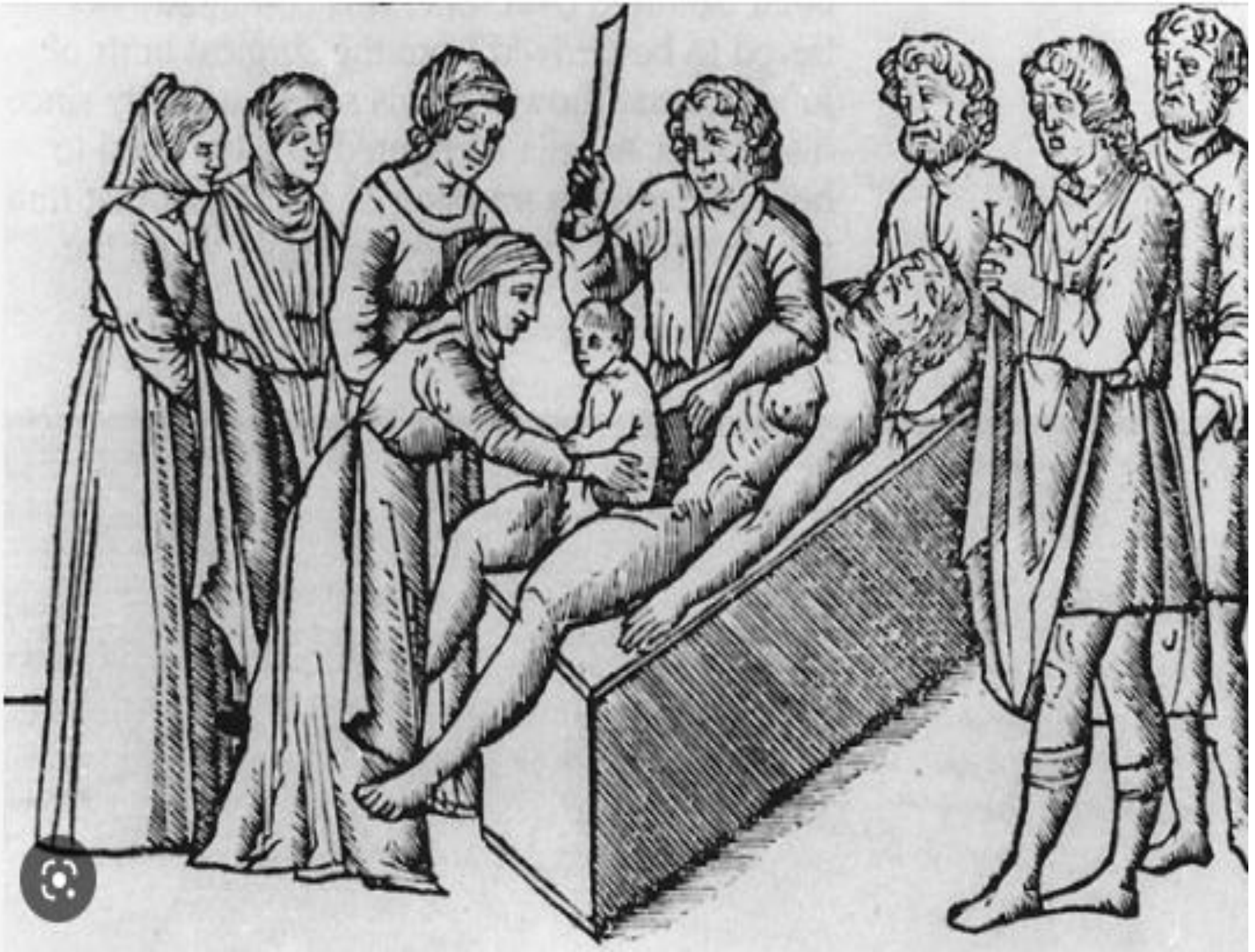
- **Infertility fellowship**





- Oral intake is stopped at least 8 hours before the procedure.
- The woman scheduled for repeat cesarean delivery typically is admitted the day of surgery and evaluated by the obstetrical and anesthesia teams.
- Recently performed hemato crit and indirect Coombs test are reviewed, and if the latter is positive, then availability of compatible blood must be ensured.

- An antacid is given shortly before regional analgesia or induction with general anesthesia. One example is Bicitra, 30 mL orally in a single dose. This minimizes the lung injury risk from gastric acid aspiration.
- Once the woman is supine, a wedge beneath the right hip creates a left lateral tilt to aid venous return and avoid hypotension.

- there are insufficient data to determine the value of fetal monitoring before scheduled cesarean delivery in women without risk factors. That said, fetal heart sounds should be documented in the operating room prior to surgery.

- For further preparation, if hair obscures the operative field it should be removed the day of surgery by clipping.
- An indwelling bladder catheter is typically placed at Parkland

Timing of elective repeat in primary cesarean

- Scheduled primary cesarean delivery at term should be performed in the 39^{th} or 40^{th} week of gestation,

- rather than in the $37^{th}38^{th}$ week.
- Medically/obstetrically indicated cesarean deliveries are performed when clinically indicated.

Timing of elective repeat

- Timing of elective repeat cesarean delivery is based on the type of previous hysterotomy incision, and is reviewed separately

antibiotic prophylaxis

- For all women undergoing cesarean delivery, we recommend preoperative antibiotic prophylaxis rather than no prophylaxis or prophylaxis after cord clamping .

Antibiotics are given up to 60 minutes before making the incision.

antibiotic prophylaxis

- We use a single intravenous dose of a narrow-spectrum antibiotic, such as cefazolin (2 grams for patients <120 kg
- and 3 grams for patients ≥120 kg) (table 2).
- Multiple doses are more costly, without clearly improving outcome.

antibiotic prophylaxis

- For women with a history of serious forms of penicillin allergy, we use clindamycin and gentamicin.

- For patients at low risk of a serious immediate allergic reaction, a cephalosporin can be administered instead of combination therapy

antibiotic prophylaxis

- For women already receiving penicillin G for prophylaxis of neonatal Group B *Streptococcus* (GBS) infection, we do not give additional antibiotics for surgical prophylaxis.

- Some clinicians administer a single dose of a narrow-spectrum antibiotic (eg, cefazolin

antibiotic prophylaxis

- For women receiving ampicillin and gentamicin for chorioamnionitis, we add either one dose of clindamycin 900 mg or metronidazole 500 mg, and continue ampicillin and gentamicin or switch to ampicillin-sulbactam postpartum until the patient is afebrile for at least 24 hours.

Bacteroides resistance to clindamycin is increasing; in areas of high resistance, ampicillin-sulbactam is preferable.

Extended-spectrum antibiotic prophylaxis

Extended-spectrum antibiotic prophylaxis may reduce infectious sequelae in women at high risk of postoperative infection (eg, labor, ruptured membranes).

Because of limitations in available data, we continue to use narrow-spectrum antibiotic prophylaxis for all patients;

however, others may reasonably choose to use an extended regimen in high-risk patients.

- **Thrombo prophylaxis**

- For all women undergoing cesarean delivery, we suggest mechanical thrombo prophylaxis .
- For women undergoing cesarean delivery at high risk of VTE, we suggest mechanical thromboprophylaxis plus pharmacologic thromboprophylaxis .
- pneumatic compression hose before cesarean delivery. These are usually discontinued once the woman ambulates.
- Pharmacologic prophylaxis is begun 6 to 12 hours postoperatively, after concerns for hemorrhage have decreased.
- Mechanical and pharmacologic prophylaxis are continued until the woman is fully ambulating.
- Women with significant risk factors for VTE persisting following delivery should receive a full six weeks of thromboprophylaxis.

antiseptic agent

We use a **chlorhexidine-based** antiseptic agent rather than an **iodine-based** antiseptic agent for skin preparation, but either approach is reasonable.

Chlorhexidine-alcohol solutions should be **allowed to dry for at least three minutes before using an ignition source**,

otherwise a nonflammable preparation (povidone-iodine or chlorhexidine soap) should be used.

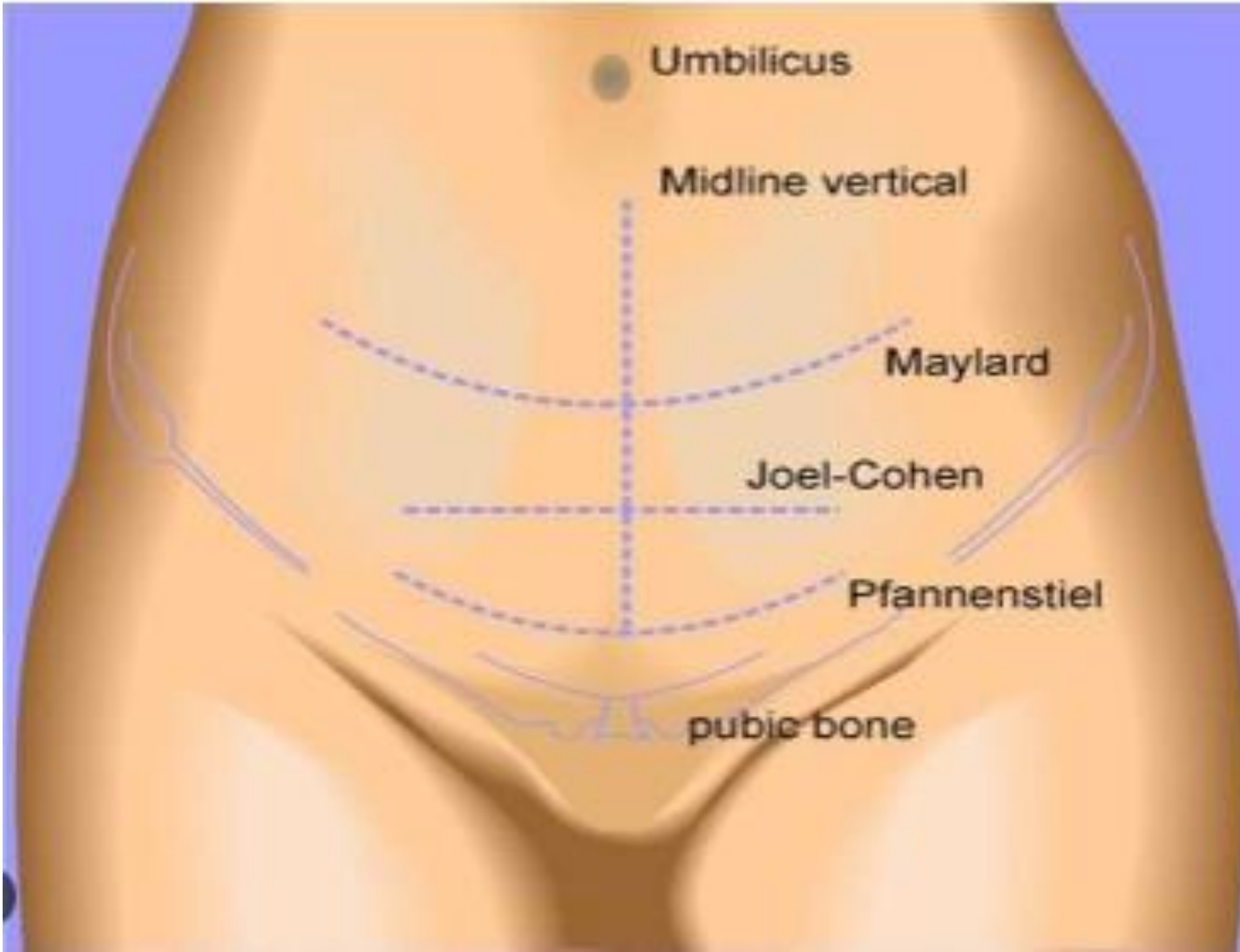
vaginal cleansing

For women in labor and women with **ruptured membranes**, we suggest vaginal cleansing **before cesarean** delivery rather than no vaginal cleansing

We use a **povidone-iodine** vaginal scrub for **30** seconds.

Vaginal cleansing in these high risk populations reduces the frequency of postpartum endometritis.

Cesarean delivery: Surgical technique


Umbilicus
Midline vertical
Maylard
Joel-Cohen
Pfannenstiel
pubic bone

initial incision

For the initial incision opening the abdomen

we suggest a **transverse** (eg, Pfannenstiel or Joel-Cohen) rather than a **vertical skin** incision A transverse incision is associated with better cosmetic appearance and possibly less postoperative pain and greater wound strength than the vertical midline incision.

However, the incision to delivery time appears to be approximately one minute faster with vertical skin incisions

- the Pfannenstiel incisions follow Langer lines of skin tension,
- This is made at the level of the pubic hairline, which is typically 3 cm above the superior border of the symphysis pubis.
- The incision is extended somewhat beyond the lateral borders of the rectus abdominis muscles. It should be of adequate width to accommodate delivery12to15 cm
- Use of the Pfannenstiel incision, however, is often discouraged for cases in which a large operating space is essential or in which access to the upper abdomen may be needed.

- The Maylard incision differs mainly from the Pfannenstiel in that the bellies of the rectus abdominis muscles are transected horizontally to widen the operating space. ligation of the inferior epigastric arteries, which lie lateral to these muscle bellies.
- Vertical infraumbilical incisions provide quick entry to shorten incision-to-delivery time (Main disadvantages are **poorer cosmetic results, higher fascial dehiscence or incisional hernia rates, and greater postoperative pain.**
- For morbidly obese patients, a vertical incision that extends up and around the umbilicus may be preferable to avoid cutting through a large

- The classical incision is a vertical incision into the body of the uterus above the lower uterine segment and reaches the uterine fundus.
- the classical incision is similar to the low-vertical incision, which is typically extended cephalad only to the extent required for fetal delivery.
- For most cesarean deliveries, the transverse incision is preferred. Compared with a classical incision,
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dissection

- A scalpel or electrocautery can be used for tissue dissection, based on the **surgeon's preference**.

uterus is displaced

During cesarean delivery, the uterus is displaced at least 15 degrees to the left to reduce aortocaval compression.

fascial incision

The **fascial incision** can be extended sharply or bluntly.

rectus muscles

- We leave the rectus muscles intact rather than using the Maylard technique.
- This improves abdominal muscle strength in the short-term.

open the peritoneum

We use **fingers** to bluntly open the **peritoneum** to minimize the risk of inadvertent injury to bowel, bladder, or other organs that may be adherent to the underlying surface.

However, a **sharp** technique is also acceptable.

bladder flap

We do not routinely create a bladder flap.

This **saves time** and **reduces blood loss**.

expansion of the hysterotomy

We suggest blunt rather than sharp expansion of the hysterotomy incision

Blunt expansion

- quick
- less risk of inadvertent trauma to the fetus,
- reduce blood loss
- reduce extension of the incision

extraction of the placenta

- We recommend spontaneous, rather than manual

Spontaneous extraction

- lower rates of endometritis
- lower rates bleeding.

Exteriorization

Exteriorization or non-exteriorization

- both acceptable.
- depends on personal **preference** and the **clinical setting**.

uterine closure

For women who would consider a **trial of labor** after a previous **cesarean** delivery, we suggest a two-layer uterine closure **rather than** a one-layer closure

closing visceral or parietal peritoneum

We suggest not closing the visceral or parietal peritoneum

Non-closure saves time and there is (increased adhesion formation).

closure of the subcutaneous tissue layer

For women with subcutaneous tissue depth ≥2 cm, we recommend closure of the subcutaneous tissue layer with sutures .

Closure **decreases** the risk of subsequent **wound disruption.**

abdominal irrigation

In women who have received **standard antibiotic prophylaxis**, abdominal irrigation probably does not further reduce maternal infectious morbidity.

Wound irrigation

is also unlikely to be beneficial.

subcutaneous drain .

- We recommend **not routinely placing** a subcutaneous drain .
- Routine use of drains does **not reduce** the odds of **seroma, hematoma, infection, or wound disruption**.

reapproximation of the skin

We suggest re approximation of the skin with **subcuticular suture rather than staples** but either technique is reasonable.

Cesarean delivery

is performed when the clinician and patient believe that abdominal delivery is likely to provide a better maternal or fetal outcome than vaginal delivery.

Scheduled primary cesarean

Scheduled primary cesarean delivery at term should be performed in the 39th or 40th week of gestation, rather than in the 37th or 38th week.

Medically/obstetrically indicated cesarean deliveries are performed when clinically indicated.

Timing of elective repeat cesarean

Timing of elective repeat cesarean delivery is **based** on the type of previous hysterotomy incision

preoperative antibiotic prophylaxis

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- For women with a history of **serious** forms of **penicillin allergy,** we use clindamycin and gentamicin.
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for prophylaxis of neonatal Group B *Streptococcus* (GBS) infection

For women already receiving penicillin G for prophylaxis of neonatal Group B *Streptococcus* (GBS) infection,

we do **not give additional antibiotics for surgical prophylaxis**.

Some clinicians administer **a single dose of a narrow-spectrum antibiotic cefazolin.**

preoperative antibiotic prophylaxis for women with chorioamnionitis,

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Extended-spectrum antibiotic prophylaxis

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Because of limitations in available data, we continue to use narrow-spectrum antibiotic prophylaxis for all patients; however, others may reasonably choose to use an extended regimen in high-risk patients.

Routine postoperative hemoglobin testing

Routine postoperative hemoglobin testing is **unnecessary** in **asymptomatic patients after planned cesarean delivery**, as the information does not lead to improved outcomes.

Routine evaluation of postdelivery hemoglobin is probably unwarranted after uncomplicated intrapartum cesarean delivery.

analgesia

- Patient-controlled **opioid analgesia** followed by **oral nonsteroidal anti-inflammatory drugs** provides adequate pain relief for most women

Removal of the bladder catheter

as soon as possible postpartum minimizes the risk of infection

Breastfeeding

Breastfeeding can be initiated **in the delivery room**.

The **usual drugs**/procedures associated with cesarean birth are **not a contraindication to breastfeeding.**

Early ambulation

Early ambulation (when the effects of anesthesia have abated)

Women may slowly increase aerobic training activities, depending on their level of discomfort and postpartum complications.

oral intake

within **six hours of delivery** are encouraged.

Dressings

- Dressings can be removed, and patients may shower within 48 hours of surgery.

The frequency of short-term complications after primary cesarean delivery

- ileus (10 to 20 percent),
- endometritis (6 to 11 percent),
- wound complications (1 to 2 percent),
- hemorrhage requiring transfusion (2 to 4 percent),
- surgical injury (0.2 to 0.5 percent),
- thrombotic events (246 per 100,000).

Neonatal risks

- include iatrogenic prematurity,
- respiratory problems
- birth injury.

major long-term risks of cesarean

- abnormal placentation (previa, accreta)
- uterine rupture during a trial of labor in future pregnancies
- The rate of **bowel obstruction** after cesarean delivery ranges from **0.5 to 9 per 1000 cesarean deliveries**, with the highest risk in women who have undergone multiple cesarean deliveries.

Long-term abdominal scar complications

- numbness,
- pain, and
- endometriosis.

- **Uterine scar complications**
- cesarean scar pregnancy and
- postmenstrual spotting.

unexplained stillbirth or subfertility.

Cesarean delivery **does not appear** to be an independent risk factor for future **unexplained stillbirth or subfertility**.

Cesarean delivery on maternal request

is a primary cesarean delivery performed because the mother requests this method of delivery in the **absence of conventional medical or obstetrical indications** for **avoiding vaginal birth**.

The best available evidence suggests that

- planned cesarean delivery is associated with a lower risk of fetal injury than planned vaginal delivery,
- longer hospital stay/recovery
- increased risks of neonatal respiratory problems,
- abnormal placentation in future pregnancies
- uterine rupture in future pregnancies if a trial of labor is attempted.
- Planned cesarean delivery minimizes the risk of surgical complications associated with **unplanned** cesarean delivery, which may become necessary during attempted vaginal delivery.

- Obstetricians are **not obliged ethically or professionally to perform cesarean** delivery on maternal request;
- early referral to another health care practitioner willing to act in accordance with the patient's request is appropriate in such cases.

- The clinician should find out the reasons for the patient's request for cesarean delivery,
- address her concerns about labor and vaginal birth and
- any misinformation leading to those concerns
- engage her and possibly her support persons in a balanced discussion about the risks and benefits of the procedure over a series of visits.
- In particular**, work** and **family pressures**, **personal fears** and **anxieties** about childbirthconcerns about pain should be addressed.

- For women planning several pregnancies, we suggest avoiding cesarean delivery on maternal request