



Maternal benefits of pregnancy & breastfeeding

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Breastfeeding

- ⦿ short- & long-term
- ⦿ health & developmental benefits to
- ⦿ children and their mothers



benefits to the children

Human milk contains of nutrients & other bioactive substances: protect against

- ⦿ Infectious
- ⦿ noncommunicable diseases

Maternal benefits

reduction of the risk for

- ⦿ Breast cancer
- ⦿ Ovarian cancer
- ⦿ endometrial cancer
- ⦿ type 2 diabetes mellitus

effects may be related

complex hormonal mechanisms involved
in regulation of breast milk production in
response to infant suckling



Benefits during lactation

- ◎ **Reduced risk of postpartum blood loss**

Through the action of oxytocin

- ◎ **Delay in resumption of ovulation:**

Exclusive breastfeeding significantly delays return of ovulation

Benefits during lactation

◎ Postpartum depression :

some study : association with shorter breastfeeding duration. causal direction is unclear

◎ Postpartum weight change

Long-term benefits

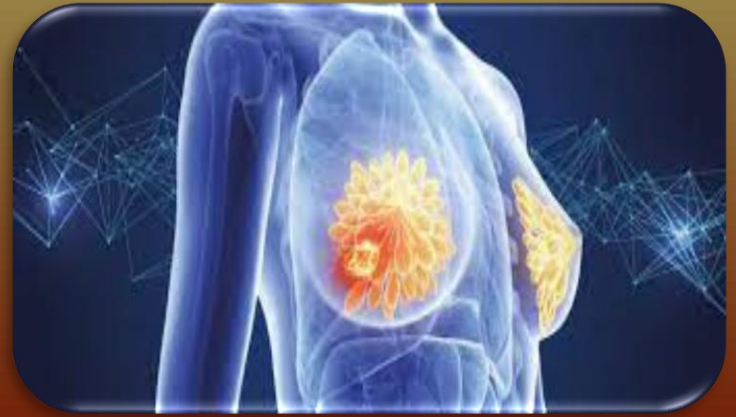
- Breastfeeding & longer duration of breastfeeding :associated with lower
 - breast cancer
 - epithelial ovarian cancer
 - Hypertension
 - type 2 diabetes
- but not bone fractures, as outlined in a systematic review

Cancer

Breastfeeding has been shown to reduce risk of

- Breast cancer
- ovarian cancer
- endometrial cancer

breast cancer



Globally

- the most common cancer in females
- the leading cause of cancer death in women

Risk factors

Nulliparity

- ⦿ Nulliparous women are at higher risk compared with parous women (RR from **1.2 to 1.7**)
- ⦿ studies suggest a **decreased risk with increasing number** of pregnancies

protective factor

◎ **Breastfeeding**

- ◎ multiple case-control & cohort studies & meta-analyses :

the magnitude of which depends on :

- duration of breastfeeding
- confounding factor of parity



فَتَوَكَّلْ عَلَى اللَّهِ
إِنَّا نَعْلَمُ سِرَّهُ
وَنَحْنُ الْغَوَّابُونَ

- data from 47 epidemiologic in 30 countries studies (\approx 50,000 women with invasive breast cancer & 97,000 controls):
- for every 12 months of breastfeeding, there was a **4.3 %** reduction in relative risk (RR) of breast cancer

اللَّهُمَّ صَلِّ عَلَى مُحَمَّدٍ وَعَلَى آلِ مُحَمَّدٍ وَتَجَمُّدْ

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Endometrial carcinoma

Protective factors

Older age at last birth

- Childbearing at an older age, independent of parity & other factors: associated with a decreased risk of EC

Research

Pregnancy duration and endometrial cancer risk: nationwide cohort study

- ⦿ from Denmark
- ⦿ risk of EC reduced regardless of abortion or birth at 40 w
- ⦿ reduction in risk could be explained by a **biological process** occurring **within the first w** of pregnancy



JOURNAL ARTICLE

Age at Last Birth in Relation to Risk of Endometrial Cancer: Pooled Analysis in the Epidemiology of Endometrial Cancer Consortium

- meta-analysis of individual **data from 17 studies** that included over **8000 cases** of EC
- significant decrease in risk per **five years** of increasing **age at last birth**

- ⦿ who last birth at ages 35 to 39 years had a **32% decrease** in risk
- ⦿ reason older age is protective is not known
- ⦿ we speculate : high progesterone levels during pregnancy may be an important protective factor

Endometrial carcinoma

protective factors

Breastfeeding

- In a meta-analysis of 17 studies including nearly 9000 EC from several countries:
- breastfeeding associated an 11% reduction in EC compared with parous patients who did not breastfeed

اللَّهُمَّ صَلِّ عَلَى مُحَمَّدٍ وَعَلَى آلِ مُحَمَّدٍ وَحَسْبُكَ



Ovarian cancer

- second or third most common gynecologic malignancy in many countries
- has a high mortality rate

Epithelial carcinoma of ovary

◎ Nulliparity

Parous patients have a reduced risk of developing ovarian cancer

◎ Endometriosis

appears associated with some subtypes of EOC (endometrioid, clear cell), but overall risk low

PROTECTIVE FACTORS

Breastfeeding

- ⦿ a meta-analysis including 5 cohort & 35 case-control :
- ⦿ breastfeeding associated **30% reduction** in ovarian cancer compared with not breastfeeding

- ◎ magnitude of risk reduction increased with total duration of breastfeeding:
- ◎ for <6, 6 to 12, and >12 months
- ◎ reductions were 15, 27, and 36 percent

لَا تُصَلِّ عَلَى مُحَمَّدٍ وَلَا عَلَىٰ أَهْلِ بَيْتِهِ



J Prev Med Public Health. 2016 Nov; 49(6): 349–366.

PMCID: PMC5160134

Published online 2016 Sep 8. doi: [10.3961/jpmph.16.066](https://doi.org/10.3961/jpmph.16.066)

PMID: [27951628](https://pubmed.ncbi.nlm.nih.gov/27951628/)

The Effect of Breastfeeding Duration and Parity on the Risk of Epithelial Ovarian Cancer: A Systematic Review and Meta-analysis

- ⦿ compared nulliparous with no history of breastfeeding:
- ⦿ combined effect of two births and <6 months of breastfeeding resulted in **50% reduction** in EOC

PROTECTIVE FACTORS

Parity

- Parous at decreased risk for ovarian cancer compared with nulliparous
- risk appears to decrease with increasing parity

- ◎ risk of EOC decreased by **8%**
for each additional pregnancy





- history of multiple gestation
- later age (>35 years old) at last pregnancy

associated with a reduction risk of EOC

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Cardiovascular disease

history of **breastfeeding**

- associated with reduced risk of **hypertension** at age 40 to 49 years

- ⦿ association stronger among longer cumulative breastfeeding durations
- ⦿ especially who had breastfed **for ≥ 24 months**

Breastfeeding and Maternal Hypertension and Diabetes: A Population-Based Cross-Sectional Study

- a systematic literature review of 19 studies from high-income countries :
- Protective effect against hypertension
- persisted in long-term follow-up

several studies :

- ⦿ higher risk of hypertension among

women never breastfed compared their
who breastfed



Research

General gynecology

Duration of lactation and incidence of myocardial infarction in middle to late adulthood

- ◎ 23 % lower risk of cardiovascular events
- ◎ women who had breastfed
- ◎ for a lifetime total of **2 years or longer**
- ◎ compared with who never breastfed

لَا تُحْمِلْ عِلْمَ مُحَمَّدٍ وَلَا مَحْرَمٍ مِنْ عَمَلٍ فَتَحْمِلُ

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Type 2 diabetes mellitus

- ⦿ Lactation associated :
- ⦿ improved glucose tolerance
- ⦿ insulin sensitivity

Type 2 diabetes mellitus

breastfeeding associated :

- ◎ significantly reduced maternal risk

of develop type 2 diabetes later in life

Type 2 diabetes mellitus

This protection : greater among women

- ◉ with longer breastfeeding durations



Type 2 diabetes mellitus

2 meta-analyses of 4 studies from high-income countries :

- ⦿ women with the longest breastfeeding durations **30% decrease** in relative risk (RR) of developing **type 2 DM**
- ⦿ compared who did not breastfeed

Type 2 diabetes mellitus

breastfeeding associated :

- ◎ significantly reduced maternal risk

of develop type 2 diabetes later in life

Type 2 diabetes mellitus

- ◎ 9% decrease in risk for each 12-M in lifetime breastfeeding duration
- ◎ after adjust for other risk factors for DM:
physical activity , BMI, smoking, alcohol use, income, education, parity, family history

Lactation Duration and Progression to Diabetes in Women Across the Childbearing Years: The 30-Year CARDIA Study

Erica P Gunderson¹, Cora E Lewis², Ying Lin¹, Mike Sorel¹, Myron Gross³, Stephen Sidney¹, David R Jacobs Jr⁴, James M Shikany², Charles P Quesenberry Jr¹

- multicenter , cohort study (n = 1238):
longer breastfeeding duration strongly associated with **25 to 47%** reduction in **DM** incidence
- after control for GDM, lifestyle behaviors, weight gain, & other clinical & sociodemographic character

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gestational diabetes mellitus

- ◉ Similar findings women with GDM



Original Research | 24 November 2015

Lactation and Progression to Type 2 Diabetes Mellitus After Gestational Diabetes Mellitus: A Prospective Cohort Study

Authors: Erica P. Gunderson, PhD, MPH, MS, RD, Shanta R. Hurston, MPA, Xian Ning, MS, Joan C. Lo, MD, Yvonne Crites, MD, David Walton, MD, Kathryn G. Dewey, PhD, ... [SHOW ALL](#) ... for the Study of Women, Infant Feeding and Type 2 Diabetes After GDM

- two-year prospective cohort study of women with GDM :
- higher intensity & longer breastfeeding associated : **lower incidence of type 2 diabetes**

اللَّهُمَّ صَلِّ عَلَى مُحَمَّدٍ وَعَلَى آلِ مُحَمَّدٍ وَبَارِكْ وَسَلِّمْ

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among women with GDM

- ⦿ systematic review & meta-analysis of 9 studies :
- ⦿ exclusive breastfeeding
- ⦿ for at least six to nine weeks
- ⦿ associated a lower risk of type 2 DM compared with
- ⦿ who had not breastfed

اللَّهُمَّ صَلِّ عَلَى مُحَمَّدٍ وَعَلَى آلِ مُحَمَّدٍ وَتَحِيَّاتِهِمْ



Osteoporosis

- lactation does not long-term adverse effects on bone health
- more studies needed to assess extended breastfeeding duration (>18 months)

- ◎ Bone mineral density (BMD) tends to decrease during lactation
- ◎ skeletal calcium main source of calcium for breast milk production

REVIEW ARTICLE

Breastfeeding and maternal health outcomes: a systematic review and meta-analysis

- meta-analysis of 6 studies from low- & high-income countries
- assessing association between breastfeeding & femoral bone mass
- concluded : no clear associations between breastfeeding & osteoporosis

اللَّهُمَّ صَلِّ عَلَى مُحَمَّدٍ وَعَلَى آلِ مُحَمَّدٍ وَتَحِيَّاتِهِمْ

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Leiomyoma

- ⦿ one of the most common indications for gynecologic surgery
- ⦿ leading to 200,000 hysterectomies
- ⦿ 30,000 myomectomies per year

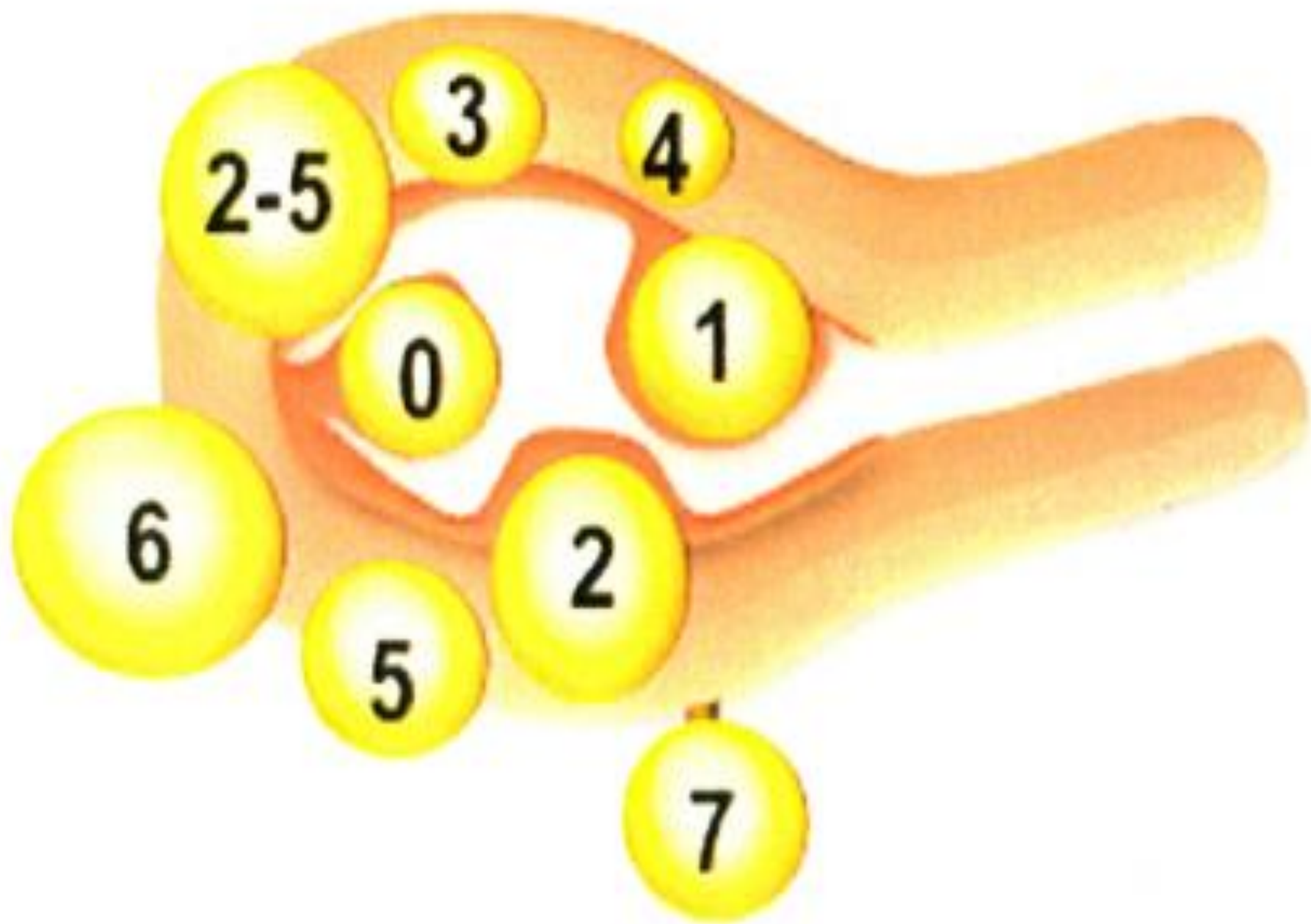


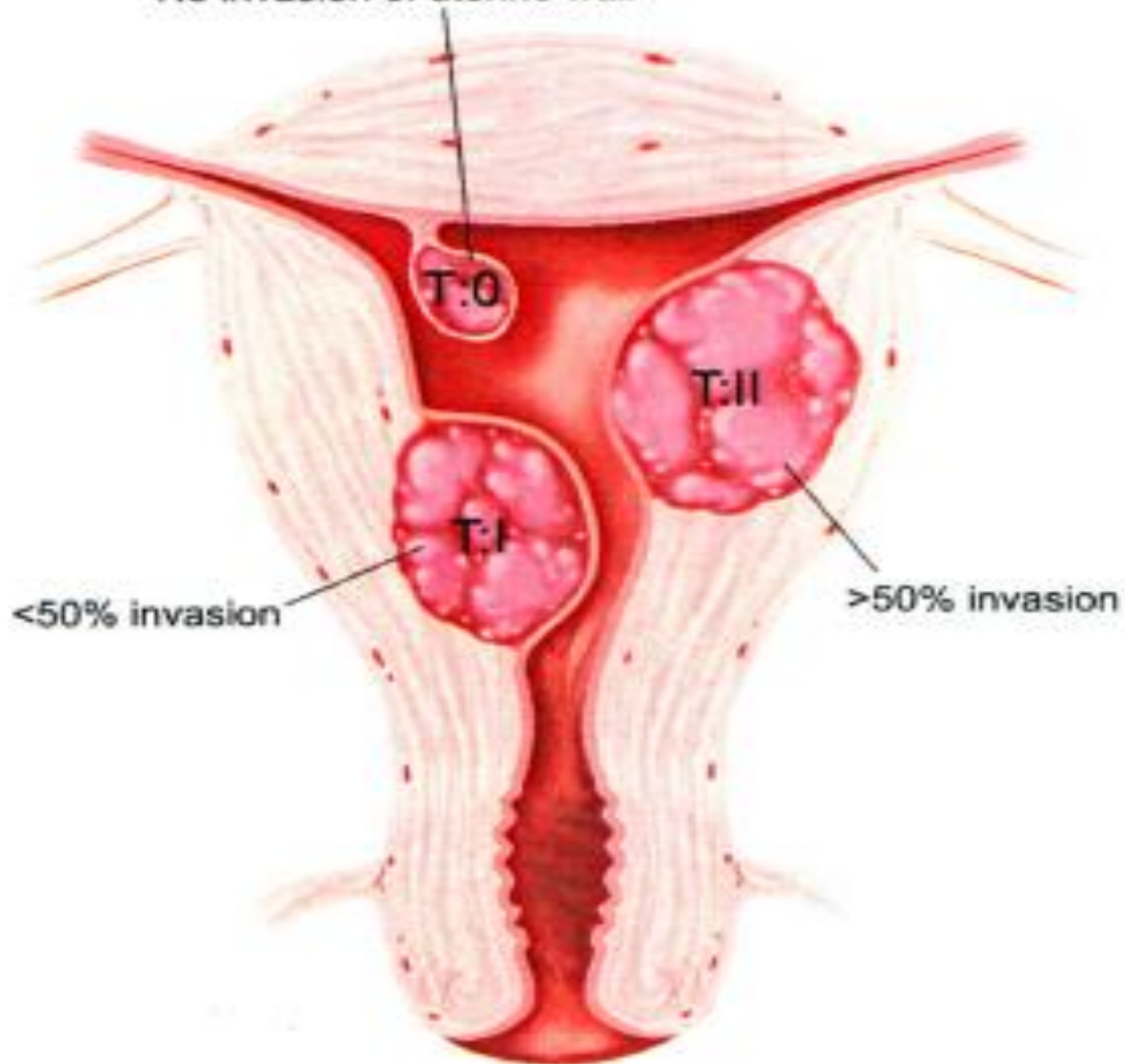
Figure 15.2 FIGO Leiomyoma Classification System.

- ⦿ Severe symptoms develop in about 30% of women with leiomyomas

The main symptoms :

- ⦿ abnormal uterine bleeding
- ⦿ bulk symptoms
- ⦿ pelvic pain or pressure
- ⦿ urinary symptoms

No invasion of uterine wall



Leiomyoma

- having pregnancies extending beyond 20 weeks decreases the chance of fibroid formation

- ⦿ early age at first birth decreases risk
- ⦿ longer interval since last birth increases risk

- ⦿ in multiparous women:
- ⦿ relative risk decreases with each pregnancy

- ⦿ woman who had **five** term pregnancies has only **one fifth** risk of a nulliparous woman of developing myomata

اللَّهُمَّ صَلِّ عَلَى مُحَمَّدٍ وَعَلَى آلِ مُحَمَّدٍ وَجَمِّعْهُمْ

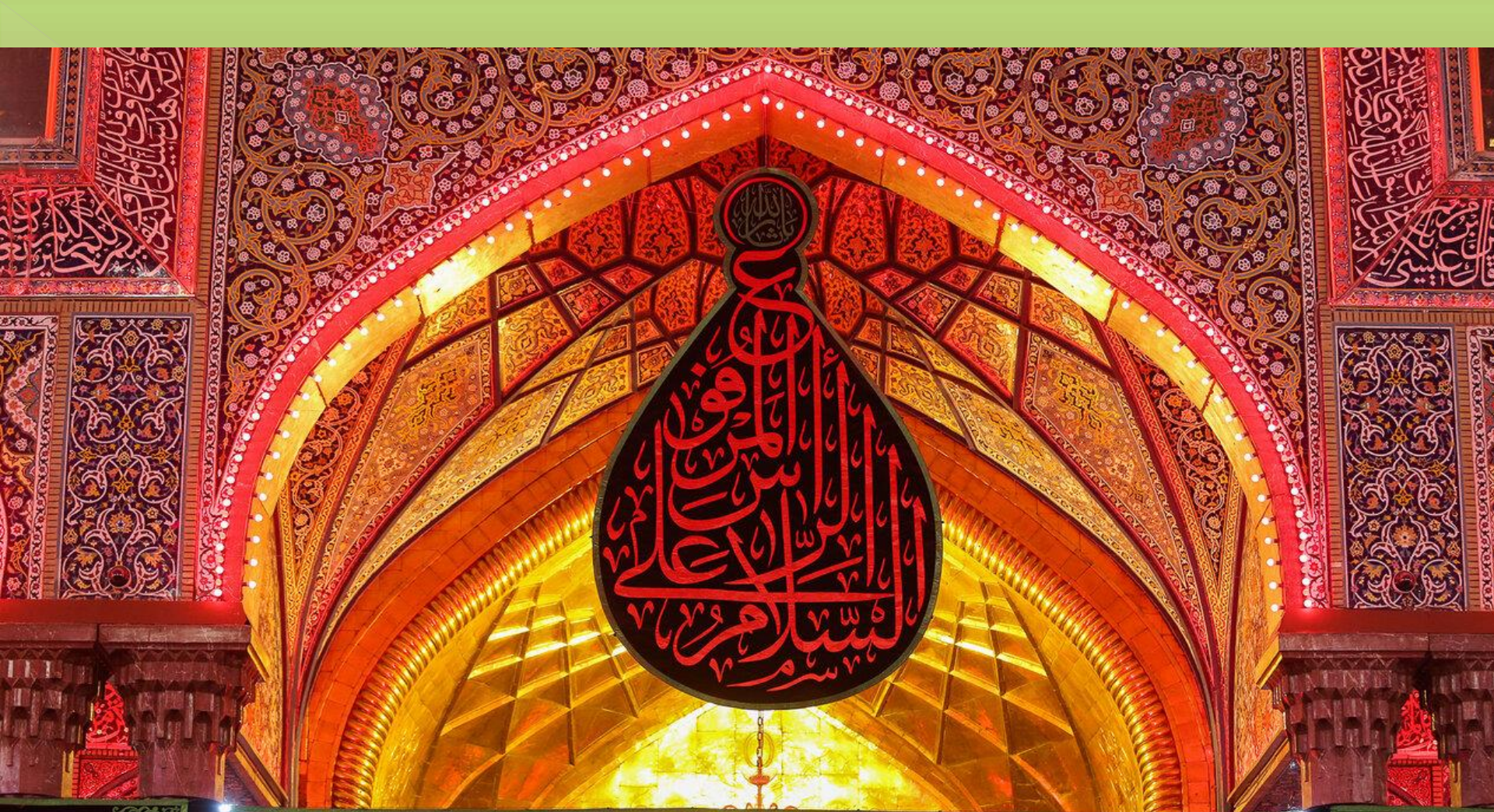
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ENDOMETRIOSIS

- Sampson : pregnancy induces involution of implants
- other authors recently:
a variable response of endometriosis to pregnancy
temporarily suppressed

- Nulliparous women at increased risk of endometriosis



قال سيد الشهداء ابو عبد الله عليه السلام مخاطبا ولده زين العابدين
والدين اذ نبت كبرياؤهما في جنتي بعثت الله المهادي
المصدر: مناقب آل أبي طالب ج ٣ - ص ٢٣٨

IMNA IMAGES
Morteza Salehi