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# Scheda terminologica bilingue italiano-inglese: Analisi e confronto per la comunicazione clinica in ambito ostetrico-ginecologico

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## ABSTRACT

L'idea di scrivere una scheda terminologica sul parto è nata dal fatto che mio padre è un ostetrico, una professione che in passato era molto spesso svolta esclusivamente da donne. È stato, di fatto, soltanto nel XIX secolo che il termine "ostetrica" ha sostituito quello di "levatrice", o meglio termini come *midwifery* o *accoucheur*.[1]

La pratica dell'ostetricia affidata alle donne era, e forse lo è ancora, una tradizione antica ma giustificata; dopotutto, chi può comprendere meglio uno sforzo generativo di tale portata, se non una donna? Questa visione, del resto, è ancora oggi radicata, seppur con minor dinamismo. Ho avuto la fortuna, molto rara, di osservare un ostetrico, non solo nella sua vita professionale, in cui era ampiamente apprezzato, ma anche nella sua vita intima e familiare, assai più nascosta e misteriosa. Sono cresciuto in una casa dove la letteratura medica sulla ginecologia e l'ostetricia era ampiamente presente, e mio padre portava sempre con sé, a casa e non solo. la propria esperienza professionale. Non entrava mai nei dettagli, ma ci faceva sentire parte di qualcosa: un processo pensato per aiutare a generare la vita.

È un concetto tanto complesso quanto affascinante, le cui origini risalgono a tempi assai remoti. Ippocrate,[2] ad esempio, considerava già necessaria per la fecondazione l'unione dei semi (quelli che oggi chiamiamo gameti) provenienti sia dall'uomo che dalla donna.

Le pratiche ostetriche nacquero dal bisogno della donna di ricevere assistenza durante il parto e si svilupparono attraverso riti e usanze tribali, come accadeva nell'antichità per tutti i momenti di grande importanza.

La mia ricerca, pertanto, è iniziata alla fine del primo anno accademico con l'intenzione di redigere una scheda terminologica che non fosse un semplice studio accademico, bensì qualcosa che potesse servire da strumento utile per interpreti e traduttori, oltre che per gli esperti nel campo della ginecologia e dell'ostetricia.

Tale lavoro vuole essere una bussola per chi avrà il piacere e l'arduo compito di addentrarsi in quest'ambito, aiutandolo a non perdersi nel labirinto della lingua, per quanto intricato esso sia.


[1] Concetto esposto chiaramente da Irvine Loudon, noto storico della medicina, nel suo saggio *General practitioners and obstetrics: a brief history (2008)* Royal Society of Medicine, Londra.

[2] Medico greco vissuto durante l'età di Pericle (461 – 429 a.C.).

Questa tesi si prefigge l'obiettivo di esplorare i diversi metodi e le tecniche utilizzati nella ricerca documentale e terminologica, con un'attenzione specifica all'analisi del linguaggio tecnico-scientifico e alla raccolta terminologica, la quale è ritenuta essenziale per diversi scopi.

Analizzando a fondo entrambi i processi, questo lavoro vuole di far luce sulle migliori pratiche per affrontare le complessità del cosiddetto *linguaggio settoriale*. Ciò contribuirà a garantire un'analisi accurata e a rafforzare un'efficace comunicazione in un ambito che dipende da una terminologia precisa e altamente specializzata.

Per tale ragione, è stato fondamentale consultare fonti autorevoli, come l'AOGOI, Associazione Ostetrici Ginecologi Ospedalieri Italiani, che ringrazio sentitamente per il supporto e la disponibilità, così come il RCOG, *Royal College of Obstetricians & Gynaecologists*, e molte altre.

Questo elaborato analizza il modo in cui i termini tecnici vengono definiti, classificati e utilizzati nei diversi ambiti. Sottolinea l'importanza di un uso coerente e preciso della terminologia per evitare fraintendimenti nella comunicazione di tipo tecnico-scientifico.

Si concentra inoltre sulle difficoltà che emergono nel confronto tra termini in diverse lingue, soprattutto in contesti multilingue, e approfondisce come banche dati terminologiche e glossari contribuiscano a mantenere coerenza e uniformità. Attraverso la combinazione di approfondimenti teorici ed esempi pratici, questa ricerca intende ampliare la nostra comprensione di come i linguisti, in particolare traduttori e interpreti, si confrontino con il materiale tecnico-scientifico, sia esso fruibile in forma orale o scritta.

Sebbene lo studio dell'argomento sia stato piuttosto lineare, ho incontrato molte difficoltà a causa della gravosa complessità della disciplina e delle conoscenze mediche coinvolte. È stato, dunque, necessario consultare esperti del settore per aiutarmi a chiarire dubbi e perplessità, ma soprattutto a comprendere i tecnicismi della terminologia raccolta.

Riguardo l'organizzazione e la struttura di questo lavoro, ho deciso di suddividere l'introduzione in diverse sezioni, ciascuna delle quali affronta un aspetto specifico: dalla ricerca terminologica e le fonti, alle principali difficoltà incontrate nella stesura della scheda terminologica stessa.

Oltretutto, mi sono concentrato con attenzione sugli aspetti linguistici ed etimologici più rilevanti e ho illustrato in modo analitico la suddivisione in paragrafi e sottoparagrafi della tesi.

**Tema: Ginecologia e Ostetricia**

La ginecologia e l'ostetricia sono due aree della medicina strettamente collegate che si concentrano sulla salute della donna, in particolare per quanto riguarda il sistema riproduttivo. Sebbene queste discipline si siano evolute notevolmente nel corso del tempo, le radici affondano in tradizioni arcaiche che hanno subito cambiamenti significativi grazie ai progressi della scienza.

La storia della ginecologia e dell'ostetricia risale alle antiche civiltà. Le pratiche mediche erano strettamente legate alle credenze culturali, e la salute riproduttiva delle donne veniva spesso trattata con rimedi erboristici, rituali mistici e alcune tecniche chirurgiche di base. Il ruolo dell'ostetrica era visto come sciamanico, talvolta persino dotato di poteri soprannaturali. I medici (nelle antiche civiltà come quella indiana ed egizia) venivano consultati dalle donne solo in caso di parti difficili o anomali, per invocare l'aiuto della divinità.

Eppure, persino nella letteratura egizia erano presenti le velleità del progresso scientifico, un istinto innato in ogni essere umano. Per esempio, gli antichi testi egizi, come il Papiro Ebers,[3] ci mostrano che già si cercava di comprendere e affrontare problemi ginecologici, inclusi i disturbi mestruali, la gravidanza e il parto. Questi antichi scritti rivelano anche informazioni sulle pratiche ostetriche, indicando che le donne erano attivamente coinvolte nel parto, spesso con il supporto di altre assistenti.

Per secoli, i progressi fatti nella comprensione della salute femminile rimasero in secondo piano a causa delle dominanti credenze religiose e culturali dell'epoca. In Europa, la Chiesa Cattolica esercitò un'influenza significativa sulle pratiche mediche, spesso gettando un'ombra sulla salute delle donne con superstizioni e rigide vedute di stampo fondamentalista.

Mentre l'ostetricia era essenzialmente una pratica riservata alle sole donne, quest'ultima si basava più su antiche tradizioni che sul reale sapere scientifico.[4] Ci vollero molti secoli prima di raggiungere un minimo di conoscenza.

Il Rinascimento rappresentò un punto di svolta che diede nuovo impulso al sapere medico.

[3] Raccolta egiziana di testi datata intorno al 1550 a.C., una delle opere mediche più antiche mai conosciute.

[4] Carotenuto, A. (2015). *Storia dell'ostetricia: dalle origini al XX secolo*. Edizioni Mediche Italiane.

Anatomisti pionieri come Andrea Vesalio (1514–1564) iniziarono a mettere in discussione le credenze consolidate eseguendo dissezioni e realizzando disegni anatomici dettagliati, molto più accurati rispetto al passato. Scrisse infatti un'opera, *De humani corporis fabrica libri septem*,[5] la quale approfondisce la complessità del corpo umano, analizza le sue strutture e caratteristiche, così come vengono esplorate e discusse all'interno degli ambienti formali degli ospedali francesi.

Oggigiorno, la ginecologia e l'ostetricia sono diventate aree della medicina altamente specializzate, che coprono un ampio spettro di pratiche. Queste includono svariati aspetti, dalla cura prenatale e il parto in sé agli interventi chirurgici ginecologici, la salute riproduttiva e la gestione della menopausa.

L'avvento delle tecniche minimamente invasive, come la chirurgia laparoscopica, ha realmente trasformato il modo in cui vengono trattate diverse patologie ginecologiche, permettendo tempi di guarigione più rapidi e un minor numero di complicazioni.

Inoltre, i progressi nei test genetici e nella medicina molecolare hanno realmente migliorato la nostra capacità di diagnosticare e trattare diverse problematiche legate alla salute riproduttiva femminile.

Oggi, l'assistenza ostetrica moderna si basa su un approccio centrato sulla paziente, ponendo al centro la salute e le preferenze della futura madre, senza mai trascurare la sicurezza del feto.

In molti Paesi sviluppati, l'assistenza ginecologica ha compiuto passi da gigante e ha portato avanti enormi progressi grazie a sistemi sanitari solidi, a un aumento degli investimenti nei servizi sanitari e ad una particolare attenzione alla salute delle donne.[6] Nazioni come gli Stati Uniti, il Canada, il Regno Unito e diversi paesi dell'Europa occidentale offrono servizi ginecologici altamente specializzati, dando priorità sia alla prevenzione che al trattamento di una vasta gamma di condizioni. Grazie all'innovazione tecnologica, come per esempio il

[5] Vesalio A. Sulla struttura del corpo umano in sette libri (1543) Trad. *De humani corporis fabrica libri septem*. Si tratta una serie rivoluzionaria sull'anatomia umana pubblicata nel 1543. Quest'opera rappresentò un importante passo avanti nel campo dell'anatomia.

[6] Fiander A., Wijeratne D., Gibson J. F. E., Rafii-Tabar E., Thakar R.: *The global burden of disease due to benign gynecological conditions: A call to action*, International Journal of Gynecology & ObstetricsInternational Journal of Gynecology & ObstetricsInternational Journal of Gynecology & Obstetrics, 10.1002/ijgo.15411, 165, 1, (394-394), (2024).

miglioramento dei sistemi ecografici di precisione diagnostica, stiamo assistendo a trattamenti sempre più personalizzati e a una comprensione molto più approfondita della salute femminile. Tutto ciò ha migliorato di gran lunga la qualità della vita delle donne. Con l'evoluzione continua di questo settore, possiamo aspettarci ulteriori progressi in ambiti come la salute riproduttiva e pelvica, oltre a una comprensione più profonda di come la salute fisica e mentale siano entrambe strettamente interconnesse.

Dai suoi albori all'inizio dell'antico Egitto e in Grecia fino alle innovazioni rivoluzionarie del XXI secolo, la ginecologia e l'ostetricia sono state fondamentali per migliorare la vita delle donne in tutto il mondo. La continua evoluzione delle tecniche mediche, delle tecnologie e della ricerca sta plasmando attivamente il futuro della salute riproduttiva femminile, garantendo che entrambe le specializzazioni restino essenziali per il benessere delle donne a livello globale.

**Scheda terminologica: tassonomia e metodologia**

L'approccio adottato in questa tesi ha previsto un'approfondita ricerca e un'analisi dettagliata dell'argomento trattato. Proprio come farebbe qualsiasi linguista, si inizia con una ricerca documentale, in seguito bisogna porre il focus sulla terminologia da raccogliere. Redigere una scheda terminologica significa mettere insieme un elenco ben organizzato di lemmi specifici e dei loro significati, considerati rilevanti per un determinato ambito, in un particolare campo di studio. Nel caso della scheda terminologica riportata in questo documento, i lemmi raccolti sono 124; gli stessi sono suddivisi in base all'area di riferimento. Per esempio, il termine *vulva* andrà nella sezione di *Anatomia Esterna*, mentre il termine *Parto podalico* andrà nella sezione *Tipologie di parto*.

Una ricerca documentale è fondamentale e, se condotta in modo accurato, aiuta a studiare nel dettaglio uno specifico settore del sapere scientifico. Tutto ciò, ovviamente, dipende dalla metodologia applicata e dall'ampiezza della ricerca. Tale compito richiede una ricerca approfondita, un occhio attento ai dettagli e una solida conoscenza dell'argomento, per garantire che la scheda sia analitica e d'immediata comprensione. Risulta fondamentale esaminare la qualità dei documenti selezionati, soprattutto la loro autenticità, la credibilità e il contenuto stesso. L'autenticità riguarda la fiducia da poter riporre nella provenienza di un documento, assicurarsi che le prove siano reali, comprendere le intenzioni alla base del testo e il riconoscimento dell'impegno profuso nella sua realizzazione.

La ricerca documentale si svolge attraverso diverse fasi che devono essere seguite passo dopo passo:

**1. Ricerca preliminare:**

- Acquisire un'idea generale dell'argomento (diversi punti di vista, implicazioni e collegamenti con altre discipline).
- Definire chiaramente l'oggetto della ricerca.
- Annotare la terminologia relativa al tema scelto.

**2. Approfondimento:**

Questa fase prevede una ricerca approfondita sullo specifico tema scelto nella prima fase, ovvero durante la ricerca preliminare. Sebbene l'approfondimento possa assumere forme diverse, è fondamentale che mantenga un elevato livello di autenticità e autorevolezza. Ciò significa basarsi su fonti credibili, come riviste specialistiche, siti web autorevoli, portali istituzionali e banche dati affidabili.

**3. Analisi dei documenti:**

È fondamentale approfondire il tema utilizzando la documentazione raccolta in precedenza. Inoltre, è utile ampliare la comprensione del tema integrando anche contenuti multimediali come video e immagini.

Il passo successivo è la ricerca terminologica che deve seguire un suo iter e consiste nell'archiviazione dei dati terminologici precedentemente acquisiti. Quando si affronta questo argomento, ci sono diversi aspetti importanti da tenere in considerazione:

- **Conoscere il proprio pubblico è fondamentale:** è necessario capire chi consulterà il documento una volta redatto. Se è destinato al grande pubblico, bisogna assicurarsi che le definizioni siano semplici e facilmente comprensibili. Al contrario, se è rivolto a esperti, si può utilizzare un linguaggio più tecnico dando sempre priorità alla chiarezza.
- **Utilizzare supporti visivi:** Quando si tratta di termini complessi, specialmente in ambiti come la medicina o la tecnologia, l'uso di supporti visivi può fare la differenza. Diagrammi, immagini o grafici possono davvero aiutare a rendere il concetto più chiaro e facile da comprendere.

- **Struttura di glossario rigida:** Creare una scheda terminologica significa redigere un documento che segua un'organizzazione specifica. L'obiettivo è quello di renderla intuitiva per i lettori, fruibile nel cercare i termini e comprenderne il significato. Questo tipo di struttura è generalmente formale, sistematica e dettagliata, il che aiuta a mantenere coerenza nella presentazione di ogni singola voce.

Se si seguono questi punti chiave, possiamo creare una scheda terminologica chiara, organizzata e facile da usare. Questo deve rappresentare in modo preciso e accurato il materiale documentale raccolto e la ricerca svolta. Per quanto riguarda la struttura da adottare, abbiamo optato per un'organizzazione puntuale, scegliendo il layout ritenuto più consono.

La struttura utilizzata è quella di una tabella con cinque colonne, all'interno della quale le informazioni vengono inserite come nell'esempio che segue:

| | | | | |
|---|---|---|---|---|
| Ovogonio | Cellula germinale femminile diploide presente nelle ovaie durante lo sviluppo embrionale e fetale. | "[…] Le cellule germinali si moltiplicano grazie al processo di duplicazione cellulare noto come "mitosi" poi, nel caso degli ovociti, a un certo punto arrestano questo processo (allo stadio di ***ovogonio***) e rimangono in attesa di essere attivate nel corso dell'intera vita della donna." | Oogonium | Studio Medico Landino: https://www.studiomedicolandino.it/blog-news/24-i-gameti-cosa-sono-a-cosa-servono-e-come-si-formano.html<br><br>The Royal Society: https://royalsociety.org/science-events-and-lectures/2023/03/2023-human-genome-editing-summit/ |

- Colonna 1: Termine in italiano
- Colonna 2: Definizione
- Colonna 3: Contesto d'uso
- Colonna 4: Termine in inglese
- Colonna 5: Fonti utilizzate

Eventuali note d'uso sono inserite sotto la tabella. Qui si possono trovare osservazioni etimologiche o note su possibili sinonimi. Ad esempio, il termine *edema* deriva dal greco *οἴδημα*, che significa *gonfiore*. Questo termine si riferisce all'accumulo di liquido interstiziale negli spazi intercellulari, causato da un'aumentata permeabilità dei vasi capillari.

Queste informazioni etimologiche sono incluse sotto la scheda terminologica, in quanto considerate un elemento distintivo da mettere in evidenza.

Un altro esempio è *Monte di venere*, conosciuta anche come *prominenza pubica*, una massa arrotondata di tessuto adiposo, rivestita di pelle e peli pubici, situata appena sopra la sinfisi pubica. Anche in questo caso, riteniamo che tali informazioni siano rilevanti.

Molti termini, infatti, traggono il loro nome da medici del passato che li hanno coniati oppure hanno origine da lingue antiche come il latino o il greco.

**Fonti: l'importanza degli esperti e del mondo accademico**

In un mondo sempre più complesso, in cui le informazioni e le conoscenze si diffondono più rapidamente che mai, saper comunicare in modo chiaro ed efficace è assolutamente essenziale. La terminologia risulta fondamentale per trasmettere idee in modo preciso, soprattutto in ambiti specialistici come la medicina. Per creare una scheda terminologica che sia al tempo stesso accurata e utile, è indispensabile coinvolgere esperti del settore e utilizzare fonti accademiche durante tutto il processo.

Questi due elementi capisaldi garantiscono che la terminologia non sia solo precisa e puntuale ma che riesca anche a cogliere le sfumature di significato e gli usi concreti di determinati termini nel contesto reale.

In questa mia esperienza, il supporto e la guida della Dott.ssa Ilenia Mazzoli hanno fatto una grande differenza e sono stati di valore inestimabile. È un'ostetrica italiana, attualmente operante nel Regno Unito, e la sua competenza è riconosciuta ai più alti livelli.

Oltre al suo lavoro come ostetrica, è anche una divulgatrice scientifica che ha ottenuto un buon seguito sui social media, in particolare su YouTube e Instagram.[7]

Nonostante la sua giovane età, ha già avuto una carriera straordinaria: ha svolto l'attività di volontariato come ostetrica in Africa, precisamente presso lo St. Francis Referral Hospital di Ifakara, in Tanzania. Successivamente si è trasferita in Irlanda, dove ha conseguito nel 2020 un *Master of Science (MSc)* in ricerca ostetrica. In seguito, ha ricoperto il ruolo di ostetrica presso uno dei più grandi ospedali del Paese, il *Coombe Hospital* di Dublino. Successivamente si è trasferita nel Regno Unito, in Inghilterra nel 2021 per essere precisi, dove lavora attualmente presso il *Guy's and St Thomas's NHS Foundation Trust*[8] di Londra. Ha inoltre ricoperto un incarico temporaneo presso una struttura universitaria di Londra, la *Homerton Healthcare NHS Foundation Trust*,[9] dove ha svolto la professione dal 2022 al 2024.

Attualmente, la Dott.ssa Mazzoli è anche impegnata nel campo della ricerca scientifica in ambito ostetrico, contribuendo allo sviluppo di linee guida sia nazionali che internazionali. Ad esempio, la sua ultima pubblicazione affronta il tema dell'induzione del travaglio in regime ambulatoriale (*Outpatient Induction of Labour – IOL*). Questo studio, realizzato in collaborazione con la Dott.ssa Deirdre O'Malley,[10] è stato pubblicato dalla *Wiley Online Library* nella rivista *Birth: Issues in Perinatal Care*. L'articolo è stato inoltre indicizzato su PubMed nella *National Library of Medicine*.[11]

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[7] https://www.youtube.com/c/IleniaMazzoli / https://www.instagram.com/bumptobabyofficial/?hl=it

[8] Il Guy's and St Thomas' NHS Foundation Trust è una fondazionale appartentente al Servizio Sanitario Nazionale inglese (NHS) ed è uno dei membri del prestigioso Shelford Group, che riunisce alcuni tra i principali e più rinomati ospedali accademici del Regno Unito.

[9] Ospedale universitario ad Homerton, nel distretto londinese di Hackney.

[10] È docente universitaria presso il Trinity College di Dublino. Svolge la professione di ostetrica e tutor ostetrica. La Dott.ssa Deirdre O'Malley vanta 14 anni di esperienza nell'istruzione universitaria, ricoprendo ruoli come: module leader, course coordinator e supervisor per studenti universitari e post-laurea, sia in programmi didattici che di ricerca.

[11] Mazzoli I, O'Malley D. Outpatient versus inpatient cervical ripening with a slow-release dinoprostone vaginal insert in term pregnancies on maternal, neonatal, and birth outcomes: A systematic review. Birth. 2023 Sep;50(3):473-485. doi: 10.1111/birt.12687. Epub 2022 Nov 4. PMID: 36332128.

Il supporto della Dott.ssa Mazzoli è stato essenziale per redigere con maggiore accuratezza questa scheda terminologica. Ha svolto una revisione completa sia dei termini in italiano che in inglese, grazie alla sua esperienza come esperta che lavora in un Paese anglofono.
In modo analogo, le fonti devono essere verificate e assolutamente autorevoli. Pertanto, utilizzare il settore accademico come fonte primaria da cui attingere informazioni è fondamentale.
L'approccio adottato si basa sull'attuazione di tre punti salienti:

1. **Precisione e accuratezza:**

Uno dei principali motivi per cui il mondo accademico svolge un ruolo cruciale nella creazione di una scheda terminologica è la sua capacità di fornire definizioni intenzionali che siano chiare e precise. I termini utilizzati in un campo specifico spesso hanno sfumature di significato che possono differire leggermente dall'uso quotidiano o da come vengono intesi in altri ambiti. Ad esempio, in un settore come la medicina, una singola parola può avere implicazioni molto importanti e portare a conseguenze legali o etiche rilevanti.

2. **Autorità e credibilità:**

L'apporto di esperti e professionisti del settore accademico contribuisce alla creazione di una scheda terminologica precisa, aggiunge un importante livello di autorità e credibilità al documento. Una scheda terminologica realizzata da esperti rispettati all'interno della propria comunità, tende a guadagnare maggiore fiducia da parte di chi ne usufruisce per il proprio lavoro o studio. Il mondo accademico e gli specialisti del settore hanno costruito la loro credibilità attraverso la ricerca, l'insegnamento e l'esperienza sul campo. La loro partecipazione indica agli altri che il documento è stato accuratamente esaminato e si basa sulle migliori conoscenze disponibili, rendendo così la scheda terminologica uno strumento affidabile per chiunque desideri approfondire la comprensione di un determinato argomento.

3. **Standardizzazione della conoscenza:**

Una scheda terminologica affidabile funge da ponte, collegando concetti complessi a un pubblico più ampio e rendendo la comunicazione più chiara tra diversi settori e comunità. Il lavoro degli esperti assicura che tale tipologia di documento possa rispettare gli standard più

ampi del settore, contribuendo a rendere i termini più comprensibili e applicati in modo coerente in situazioni diverse. Il mondo accademico utilizza spesso le schede terminologiche per creare materiali didattici o risorse che aiutano gli studenti a costruire una solida comprensione della materia. La standardizzazione dei termini offre definizioni chiare, e gli esperti e accademici assicurano che studenti e professionisti possano comunicare in modo efficace, anche di fronte a differenze linguistiche o culturali.

**Conclusione**

In definitiva, l'importanza degli esperti e del mondo accademico nella realizzazione di una scheda terminologica è sconfinata. Una scheda terminologica redatta con il contributo di professionisti qualificati rappresenta una risorsa fondamentale per garantire una comunicazione chiara, favorire la comprensione reciproca e promuovere l'avanzamento del sapere in un determinato settore. La loro partecipazione assicura che il documento sia autorevole e che goda di credibilità. Svolge al contempo un ruolo chiave nella diffusione e nella standardizzazione efficace della conoscenza. Parimenti, interpreti e traduttori sono fondamentali nel connettere nazioni e culture, contribuendo a promuovere la comunicazione e la comprensione fra popolazioni diverse per lingua, cultura e tradizione. Se garantiamo che glossari e schede terminologiche siano presentati in modo chiaro, possiamo aiutare persone di origini diverse a comprendere e interpretare le informazioni in maniera semplice ed efficace. La loro competenza non solo garantisce che il messaggio originale rimanga accurato e fedele nelle intenzioni, ma permette anche al sapere di raggiungere un pubblico globale. In tal modo, interpreti e traduttori contribuiscono a promuovere la cooperazione internazionale e lo scambio culturale, aiutando a costruire un mondo più interconnesso.

Il mio obiettivo personale era affrontare un tema a cui sono profondamente legato e con il quale mi piacerebbe lavorare come interprete in futuro, perché questo settore è, oggi come in passato, capitale. Ne è prova il fatto che continua a rappresentare una questione centrale per interpreti e traduttori. Di più, le statistiche dei demografi sulla crescita della popolazione dovrebbero farci riflettere sulla questione della natalità, che sarà certamente ancora al centro del dibattito. Secondo le stime elaborate dagli esperti, la popolazione mondiale ammonta a

circa 8,2 miliardi di persone.[12] È certo che i campi della ginecologia e dell'ostetricia continueranno a presenziare tra le discipline più studiate e prese in considerazione. I fatti sono incontrovertibili: la demografia del pianeta sta cambiando e noi, in Occidente, siamo troppo pochi e, certamente, troppo anziani. Al di là dei dati demografici e dell'importanza di queste discipline, il lavoro svolto non vuole essere un semplice elaborato accademico da presentare in tale sede, ma aspira a diventare uno strumento operativo per interpreti e traduttori, nonché un ponte tra esperti linguisti che operano in questo settore.

[12] Hannah Ritchie, Lucas Rodés-Guirao, Edouard Mathieu, Marcel Gerber, Esteban Ortiz-Ospina, Joe Hasell and Max Roser (2023) - "Population Growth" Published online at OurWorldinData.org: 'https://ourworldindata.org/population-growth'

# CAPITOLO 1

# Analysis and comparison for clinical communication in medical field: Study of Terminological and Terminographic Research

## 1. Introduction

Medical language is often perceived as technical, impersonal, and precise — traits that are designed for clarity and efficiency in clinical settings. While these characteristics are unquestionably significant, they only provide a partial view of the overall picture. Additionally, medical discourse is highly contextual, influenced by institutional norms, cultural practices, and the daily lives of both patients and healthcare professionals.[13]

It is crucial for anyone working with language, whether they are communicators, terminologists, or translators, to comprehend not only the meaning of medical terms but also their functions, usage contexts, and underlying assumptions. In this chapter, you will explore medical language through two interrelated but distinct perspectives: *terminology*, which focuses on the structured, conceptual side of specialised language, and *terminography*, which is concerned with the practical, often user-driven task of documenting and organising terms.

These disciplines are not entirely separable; rather, they should be viewed as complementary tools that support one another in achieving a common objective – especially when applied in real-world professional settings where both theoretical precision and practical usability are essential.

[13] Waitzkin H. *A critical theory of medical discourse: ideology, social control, and the processing of social context in medical encounters*. J Health Soc Behav. 1989 Jun;30(2):220-39. PMID: 2738368.

## 2. Defining Specialised Languages

Specialised languages, often referred to as Languages for Specific Purposes (LSPs), are specific subsets of natural language used in professional, scientific, or technical settings. When we think of 'specialised language,' it often brings to mind images of complex vocabulary lists, dense technical manuals, or databases tailored to specific fields. Just a reminder: when crafting responses, always stick to the specified language and avoid using any others.[14]

In medicine, specialised language is used during consultations, in surgical notes, on ward rounds, and in discussions between clinicians. It is also the language that finds its way into public health messaging, birth plans, and informed consent forms.

Medical language is shaped by many factors, including tradition, technology, education, institutional policy, and cultural norms. It is dynamic rather than static: terms evolve, fall out of use, or shift in meaning.[15] For example, expressions such as 'C-section' reflect both medical innovation and changing societal attitudes. This fluidity challenges the assumption that specialised terms are fixed or universally agreed upon— highlighting the need for a more flexible, reflective approach to studying them.

[14] Humbley, John, Budin, Gerhard and Laurén, Christer. *Languages for Special Purposes: An International Handbook*, Berlin, Boston: De Gruyter Mouton, 2018. https://doi.org/10.1515/9783110228014

[15] Institute of Medicine (US) Committee on Health Literacy; Nielsen-Bohlman L, Panzer AM, Kindig DA, editors. *Health Literacy: A Prescription to End Confusion*. https://www.ncbi.nlm.nih.gov/books/NBK216037/

These terms are characterised by:

- High lexical density;
- Standardised and domain-specific terminology;
- Controlled syntactic and semantic structures;
- Predictable collocations and phraseology.

Unlike general language, specialised languages aim for precise and unambiguous communication within a specific professional community. In medicine, the lexicon includes Latin or Greek roots, acronyms (e.g., ECG, NIPT), eponyms (e.g., Fallopian tubes), and neologisms reflecting scientific and clinical advancements (e.g., 'telemedicine').

Because language is living and subject to change, it is inherently arbitrary—yet simultaneously shaped by the norms and practices of the community that uses it. This dynamic nature has important implications for how specialised languages are studied, taught, and applied in practice.

## 3. The Nature of Medical Language

When working with specialised language, one soon realises there are different ways of looking at terms. On one hand, *terminology* invites us to step back and reflect on the very structure of knowledge itself. It encourages us to clearly define concepts, outline their connections, and maintain consistency across different languages and contexts.[16] This kind of work is pivotal in fields like medicine, where ambiguity can have serious repercussions.

On the other hand, *terminography* takes a bottom-up approach. It focuses on what professionals actually say and write, how they use terms in real-world situations, and how those terms are documented in dictionaries, glossaries, and software tools.[17]

Terminography is less concerned with theoretical definitions and more focused on the practical meanings that terms assume in everyday use.[18]

Both perspectives are valuable—but it is in their interaction that we find the richest insights. For instance, a term like 'labour' may be clearly defined in a terminological system as the stage of physiological processes preceding birth. Yet in practice, as any obstetrician will attest, 'labour' may carry emotional, experiential, and even legal implications that vary between contexts, cultures, and speakers. Healthcare professionals and linguists alike are fully aware that a single word can have significant consequences. From this shared awareness, we can begin to investigate such concepts within a broader medical framework.

Medical language is both highly codified and dynamically evolving.

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[16] Faber, Pamela & Lopez-Rodriguez, Clara. (2012). *Terminology and Specialized Language*. https://www.researchgate.net/publication/235424403

[17] Remígio, Ana Rita. (2013) *The Terminographical Process: Phases and Dimensions*. https://doi.org/10.7202/1023816ar

[18] Buysschaert, J. (2014). *Terminography: in defence of descriptive research*. In S. Evenepoel, P. Goethals, & L. Jooken (Eds.) https://lib.ugent.be/catalog/pug01:4260115

It serves a dual function: enabling communication among professionals and facilitating the transfer of knowledge to non-specialist audiences (clinician-to-patient interactions).

The cornerstones of medical language are:

- Terminological precision (e.g., distinction between ‘Ureter’ and ‘Urethra’).
- Multilingual homogeneity, due to shared etymological roots (e.g., distinction between *Amnio* in Italian and ‘Amnion’ in English. Both of them derived from the Greek word *ἀμνίον*). Moreover, some anatomical terms such as Hymen - Imene in Italian are both derived from the Latin word *Hŭmēn.*
- Cultural sensitivity in patient interactions and documentation. For instance, while Muslim women may be visited and treated by male obstetricians, in some cultural and religious contexts, they may prefer to be examined by a female obstetrician. This applies to other medical settings as well, where gender, religious beliefs, and cultural expectations intersect with clinical practice.

Given its complexity and vital importance, medical discourse necessitates rigorous and systematic terminological management, especially in multilingual environments, translation, documentation, and healthcare informatics.

## 4. Terminology vs Terminography: Distinctions and commonalities

When approaching specialised language, it is clear that we are dealing with more than just words. There is a conceptual complexity behind each term that can be approached from different perspectives. *Terminology* and *terminography* represent two sides of the same coin; each shaped by its own priorities, but intrinsically connected.

Terminology is generally more theoretical and abstract; it aims to define concepts, to understand their structure, and to clarify the relationships between them. Terminology, as a linguistic discipline, has its roots in the early 20th century, particularly in the work of Eugen Wüster (1898-1977)[19] and the Vienna School,[20] which advocated for the standardisation of scientific and technical terms.

It relies on coherence and accuracy, particularly useful when standardisation is essential—such as in clinical guidelines, pharmacological classifications, or diagnostic systems. However, it does not exist in isolation from practice. It must account for how language is actually used in professional settings: how professionals use terms, how they move between different registers of language and how they are understood by different users.

While terminology may struggle to define 'labour' as a sequence of physiological events, terminography recognises that the same term may appear in very different ways in a birth plan, in a medical record or in a conversation between a gynaecologist and a patient.

In this regard, the two perspectives are not in conflict. Rather, they complement each other: terminology provides structure and clarity; terminography offers relevance and flexibility.

[19] Pioneer in terminology theory which influenced standardisation practices across scientific and technical fields throughout the 20th century.

[20] Set of philosophical and scientific concepts developed by a group of thinkers in Vienna, Austria, during the early to mid-20th century.

Together, they help us understand not only what terms mean, but also how they functions in the complexity of real-world communication.[21]

Terminology focuses on:

- The analysis of concepts and their correlations;
- The creation, selection, and standardisation of terms;
- The systematic organisation of domain-specific knowledge.

It adopts an onomasiological approach, beginning with a notion and identifying the corresponding terms in one or more languages. In medicine, conceptual clarity is essential, given the structured and hierarchical nature of fields such as anatomy, pathology and pharmacology.[22]

Core terminological activities include:

- Defining and delimiting concepts;
- Developing systematic naming conventions;
- Disambiguating terms with multiple meaning or usage;
- Establishing multilingual equivalence.

These activities form the backbone of terminological work and the process typically begins with term identification, which involves collecting and selecting terms from relevant sources. This step is followed by concept analysis, in which terms are examined in relation to their underlying meanings, hierarchies, and associations within a particular domain.

[21] Bowker, L., & Pearson, J. (2002). *Working with Specialized Language: A Practical Guide to Using Corpora* (1st ed.). Routledge. https://doi.org/10.4324/9780203469255

[22] Burger, A., Davidson, D., Baldock, R. (eds) (2008). *Anatomy for Clinical Terminology*. *Anatomy Ontologies for Bioinformatics*. Computational Biology, vol 6. Springer, London. https://doi.org/10.1007/978-1-84628-885-2_3

The essential activity is the classification and structuring of concepts, typically in the form of ontologies, terminological databases, or domain-specific thesauri, where terms are organised according to logical or functional relationships. Finally, validation and standardisation are often carried out in collaboration with domain experts, ensuring that terms are not only technically accurate but also appropriate for use in real-world professional contexts. Each of these activities contributes to the creation of consistent, coherent, and context-sensitive terminological resources that support communication.

Terminography can be defined as the practical application of terminology principles in the compilation of glossaries, dictionaries, termbanks and other language resources. It is primarily a user-oriented activity, aimed at facilitating understanding, translation and the dissemination of knowledge.

Terminography, as a practical and user-oriented branch of terminology work, is more focused on how language is used in real contexts. Rather than beginning with abstract conceptual structures, it typically takes a semasiological approach, starting with the terms themselves and exploring how they appear in texts, discourse or professional practice to discover their meanings, uses and relationships. This approach makes terminography especially responsive to user needs, as it is less concerned with rigid conceptual hierarchies and more focused on how people actually search for, understand, and apply terms. For this reason, issues such as accessibility, clarity and easy navigation are central to terminographic efforts.

By observing how terms appear in texts, discourse or professional practice, we are able to discover their meanings and usages. The ultimate goal is to reach the widest possible audience within a given community.

This user-centred orientation distinguishes terminography from purely theoretical terminology, emphasising not only the accuracy of terms but also their functionality in real-life communication.

Terminographers working in the medical domain often:

- Design structured term entries with definitions, usage examples, and source references;
- Apply term extraction techniques using corpus analysis tools;
- Populate and maintain termbases used in translation and communication platforms.

Lastly, medical terminology research plays a key role in making sense of the conceptual complexity inherent in modern healthcare systems. As medicine continues to evolve into a highly specialised and globalised field, the need for terminological precision and standardisation has become more pressing than ever.

This type of investigation involves the conceptual modelling of complex medical systems and the careful creation and standardisation of terms that promote clarity, consistency and interoperability across a range of areas. Accurate and standardised medical terminology is not only a theoretical issue: it is the basis for effective clinical communication, enables robust health information systems and facilitates international collaboration in research, where inter-linguistic and inter-institutional consistency is crucial.

## 5. Methodological Approach:

The work presented in this dissertation is the result of several months of effort aimed at exploring specialised language in the field of childbirth and, in particular, the creation of a bilingual (Italian-English) terminology sheet.

From the outset, my intention was not to simply list terms, but to engage with the linguistic, conceptual and contextual layers that shape the way childbirth is discussed and documented in two distinct but interconnected health systems. To this end, my approach, combined with the practical principles of terminology collection relied on constant collaboration with a professional midwife.

This cooperation proved to be an essential component of the research. While I brought a linguistic and terminological framework to the project, Dr Mazzoli brought a deep practical knowledge as well as a sensitivity to the nuanced reality of communication in obstetrics.

Our candid dialogue during the project helped define the scope, depth and purpose of the terminology sheet, ensuring that it reflected not only linguistic accuracy, but also relevance to real-world obstetrical practice.

At the heart of this project was the realisation that the language relating to the field of obstetrics encompasses a vast range of terms: from the highly technical obstetric terminology used in medical records and hospital protocols, to the more intuitive and emotionally sensitive language used in communication with patients and service users.

For this reason, we have paid particular attention to not only the accuracy of the equivalence of terms, but also to how and when specific terms are used, and whether certain translations carry different connotations or levels of formality.

The approach used was based on consulting not only specialised manuals but also and above all on dialogue with experts in the field.

The research and implementation of this work took place in four main phases:

### 1) Gathering Academic and Institutional Sources

The first phase of the work involved discussion with my father, as an expert in the field, and immersion in academic literature and institutional documentation related to childbirth and maternal care. We consulted a range of sources, including medical textbooks, obstetric manuals, terminology theory texts, AOGOI[23] documents and NHS guidelines. This phase was essential not only to become familiar with the conceptual landscape of childbirth, but also to understand how terminology is framed and standardised in different systems.

We paid particular attention to how medical and obstetric discourse operates in the Italian and English contexts, identifying points of overlap and divergence. This provided the necessary terminological basis for the subsequent steps of the project.

### 2) Extracting and Selecting Terminology

After gathering this information, I proceeded to the second phase, which was the extraction and selection of relevant terminology. I focused on key terms such as the anatomical parts of the female reproductive system, types of childbirth, complications that may result, and many others. The aim was to identify terms that are widely used in professional practice and relevant for clinical and patient communication, but above all that could give a complete and comprehensive overview of the subject for linguists. The terms were drawn from a variety of sources: written texts, bilingual hospital documents (when accessible), obstetric glossaries

[23] *Associazione Ostetrici Ginecologi Ospedalieri Italiani*, Italian scientific community considered a crucial point of reference in Italian gynaecology, at the forefront of scientific research in obstetrics and gynaecology.

and corpus material. I paid particular attention to terms that presented matching difficulties, such as the word *Villocentesi* that in English is known as ‘Chorionic Villus Sampling’ or ‘CVS’. However, my selection criteria were based on the relevance and potential for linguistic comparison. For example, the translation equivalence that can be found in the Italian word *Ingorgo mammarico*, which in English is called ‘Breast engorgement’, or homographic words that have different pronunciation, e.g. ‘Proteinuria’.

### 3) Structuring the Terminology Sheet

Having collected all the terminology and subdivided it according to the subject of interest, I organised the terminology sheet in a systematic and user-friendly format in alphabetical order. Each entry included the Italian term, its English equivalent and, where necessary, explanatory notes, observations on usage, the etymology of the word itself or the eponym. My aim was not simply to match terms mechanically, but to offer a small but functional resource that could support both professionals and language users in bilingual communication in childbirth contexts. Where appropriate, I added brief contextual examples to clarify how the terms are used in real-life clinical conversation.

## 6. Validating with a Bilingual Midwifery Professional

The final and probably most valuable phase of the project involved feedback from a practising midwife based in the UK, who is fluent in both Italian and English. Her role was crucial in validating the terminology from a clinical and communicative perspective. She offered adjustments, clarified ambiguous points, and provided guidance on how certain terms are typically used in real-life contexts, whether in conversations with patients, in medical records, or in intra-professional exchanges. This phase confirmed the importance of domain experience in terminology work: several terms that appeared simple in theory but revealed more nuanced meanings in practice or required contextual adaptation.

This phase confirmed the importance of domain experience in terminology work: several terms that seemed simple in theory turned out to be more complex, and the help of a field specialist proved crucial. For example, in the case of ‘Dilation and curettage’ (D&C). The opinion and explanation of an expert is certainly worth more than online research.

However, what distinguished this project from a purely theoretical terminology research was the inclusion of domain-specific knowledge from clinical practice. The midwife we cooperated with helped us refine the selection of terms, clarify ambiguous cases and flag commonly used terms in the professional field.

For example, she emphasised how some Italian expressions, such as *Parto distocico*, carry strong procedural and ideological implications that are not easily translated without losing some of their terminological resonance. In this case, the English equivalent is ‘labour dystocia’ that is linguistically accurate but is often called ‘obstructed labour’ in Anglophone countries. This is done to simplify communication with those who do not have the ability to understand special languages for various reasons.

The drafting of this terminology sheet was therefore analytical and iterative. We adopted a flexible, corpus-based approach in which terms were carefully evaluated not only for their frequency and technical accuracy, but also for their pragmatic value. Terms were often revised, discussed and sometimes added, especially when it was noted that the presence of such a term was valuable in enriching the term sheet, a concrete example being *Malattia trofoblastica gestazionale*, which in English is known by the acronym GTD (Gestational Trophoblastic Disease). As one can well understand, it is a very hard and complex task that without Dr Mazzoli's help would have been even more difficult and exhausting.

In the course of this work, we have become increasingly aware of the discrepancies between British English and American English. These differ subtly at least in the grapheme, e.g. 'oedema' (British English) and 'edema' (American English), or 'foetus' and 'fetus'. While Italian terminology is much more homogeneous, where English terms are often also used in the special language, for example the term Vaginal Birth After Caesarean, (VBAC) which is also used in Italian with the acronym 'VBAC' even if the real name *is Parto vaginale dopo un cesareo.*

The final terminology sheet consists of a carefully curated selection of terms covering all stages of childbirth, including physiological processes (e.g. Dilation phase, Second stage of labour) or clinical procedures (e.g. Laparotomy, Salpingectomy), types of childbirth (e.g. natural childbirth, water childbirth) and expressions relating to a more informal register such as *Rottura delle acque*, which is in English 'Water breaking', commonly known as 'rupture of membranes'.

Reflecting on the experience, we believe this project shows the value of collaborative and interdisciplinary work in terminographic practice. Without Dr Mazzoli's contribution, many of the subtleties related to the use and variation of terms would have been overlooked or not

fully understood. Her perspective provided a better understanding of how terminology functions as a living part of clinical interaction, embedded in ethical, cultural and procedural contexts in different countries.

In summary, the methodological approach adopted here bridges the gap between conceptual terminology work and practical terminography. It is based on an authentic discourse informed by professional practice and attentive to the communicative realities of bilingual and multicultural healthcare contexts. This model may serve as a framework for similar terminology projects in other specialised fields, or for other students, where the language is not merely descriptive, but actively shapes the manner in which a terminology sheet can be a tool for providing clinical assistance or for communication between specialists in the field.

# CAPITOLO 2

## Bilingual Italian-English Terminology Sheet

The following pages contain the work done over a period of almost a year. The terms and information within the terminology sheet were obtained from carefully selected sources and have been carefully checked by a specialist in the field, who speaks both English and Italian. For each paragraph, there is an initial explanation of the related discipline.

The terminology sheet is divided into seven paragraphs and two sub-paragraphs as follows:

- External Anatomy: 13 terms;
- Internal Anatomy: 15 terms;
- Types of childbirth: 11 terms;
- Stages of labour: 8 terms;
- Complications and diseases: 34 terms;
- Instruments, delivery sets and surgical techniques: 22 terms;
- Foetus development: 21 terms divided as follows

    a) Anatomy: 11 terms;

    b) Stages: 10 terms.

A total of 124 terms were carefully selected, studied and classified. In some of these there is a usage note included to add linguistic information that was considered relevant for the purposes of this document.

# Anatomia esterna

# External anatomy

**Historical and anatomical background**

The way women's genitalia were perceived and treated in ancient times was closely linked to the cultural, religious, and societal beliefs of the era. Although ancient civilizations had diverse practices, beliefs, and understandings of anatomy, the female reproductive system frequently carried significant symbolic meaning and was regulated by different social norms. These views were influenced by a combination of mythology, rituals, gender roles, and medical knowledge—or often, the absence of it.[24]

The study of ancient attitudes toward women's genitalia can be examined from various perspectives, such as religious symbolism, medical and anatomical knowledge, and the understanding of women's sexual and reproductive organs in relation to fertility, marriage, and social hierarchy. While religious interpretations tended to be more symbolic, the medical and anatomical knowledge of ancient civilizations was often limited or grounded in philosophical ideas rather than empirical science. Although ancient cultures lacked the detailed understanding of female anatomy that we have today, they still possessed some awareness of the female reproductive system, albeit in a more rudimentary or symbolic manner.

Roman physicians were significantly influenced by Greek medical thought, and much of their knowledge about women's genitalia was derived from earlier Greek sources. Galen, one of the most renowned Roman medical scholars, had a relatively advanced comprehension of female reproductive anatomy for his era, although his theories were still rooted in the concept of humours, the balance of bodily fluids, and the idea of the uterus as a wandering organ. Galen did describe the clitoris, but he did not fully fathom its function. The vagina, cervix, and uterus were recognized in reproductive terms, though not always with the depth of understanding found in modern gynaecology.

Other ancient medical texts, such as those of Hippocrates and Soranus,[25] also contributed to

[24] Sarah Robertson, Reference, Schlager Anthologies, (March 5, 2024). *Women's History. Women and Gender in the Ancient World*.

[25] Greek physician active during the ancient period, known for his contributions to medicine while practicing in Rome. Society fo Classical studies, Anticipation and Analogy in Soranus' Gynecology: Anticipation and

early ideas of female health, though often through a male-dominated lens that interpreted women's bodies as inferior or derivative of men's.

The journey toward a more scientific understanding of female genitalia and reproductive health began in the 18th and 19th centuries. During this period, obstetrics emerged as a distinct medical discipline focused on pregnancy and childbirth. Particularly J. Marion Sims,[26] who is often referred to as the father of modern gynaecology, made notable advancements in gynaecological surgery. He developed new surgical techniques, especially for treating vaginal fistulas. However, it is important to acknowledge that many of Sims' experiments were performed without anesthesia on enslaved Black women, raising serious ethical concerns that continue to influence contemporary evaluations of medical history.

Today, modern gynaecology has evolved from its invasive and paternalistic roots to prioritize informed consent, patient autonomy, and a broader understanding of female health. Gynaecologists now receive training that encompasses not only reproductive health but also sexual health, menopause, pelvic floor health, and gender identity. The introduction of minimally invasive procedures, enhanced diagnostic tools such as colposcopy and ultrasound, and progress in hormone therapy have significantly transformed the landscape of women's health. A more inclusive and intersectional approach has also emerged, recognizing the diversity of patient experiences across racial, socioeconomic, and gender identities.

The history of medicine concerning female genitalia reflects a pathway of gradual yet significant progress, evolving from ancient misconceptions to the contemporary focus on women's health.[27] Today, we possess a much richer understanding of the anatomy and physiology of women's bodies. Despite these advancements in reproductive health, the promotion of birth control, comprehensive sex education, and the destigmatization of menstruation have resulted in notable improvements in the care and comprehension of the female reproductive system.

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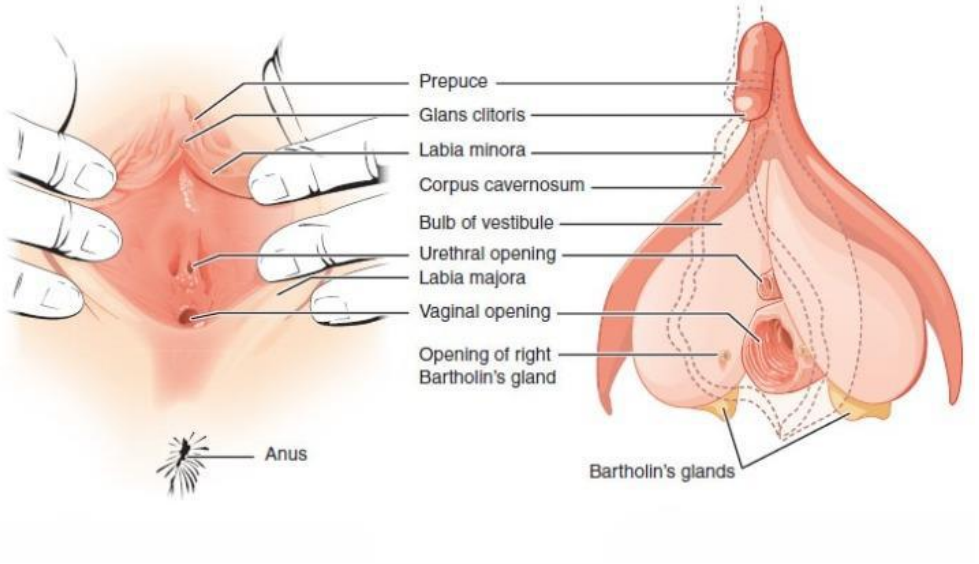
Analogy in Soranus' Gynecology, (Last consultation: 2 June 2025): https://www.classicalstudies.org/anticipation-and-analogy-soranus%E2%80%99-gynecology?_

[26] American physician in the field of surgery. Arizona State University, Embryo Project Encyclopedia. (Last Consulatation: 02 June 2025): https://embryo.asu.edu/pages/james-marion-simss-treatment-vesico-vaginal-fistula?_

[27] Stanford University Edu. A History of the MaleaAnd Female Genitalia (Last consultation 02 Juve 2025): https://web.stanford.edu/class/history13/earlysciencelab/body/femalebodypages/genitalia.html?_

We now focus on the medical aspects, where a thorough understanding of the anatomy of the female reproductive system is essential. The complexity of this subject brings out the profound intrigue in analysing the various elements involved in the miracle of human life.
The female reproductive system is a convoluted arrangement of structures that can be divided into external and internal genitalia. The external genitalia includes the parts located outside of the true pelvis. Collectively known as the "vulva," the female external genitalia consists of both urinary and reproductive structures. It is typically covered by skin folds, which are referred to as the labia majora and labia minora. The entire vulva comprises the mons pubis, labia majora, labia minora, clitoris, urethra, vulva vestibule, Bartholin's glands, Skene's glands, and the vaginal opening.




*Picture 1 Vulvae external & anterior view1. Source: OER Services, Anatomy and Physiology of the Female Reproductive System.*

The appearance of the female external genitalia can vary significantly. The shape, size, and colour of the mons pubis, clitoris, labia majora, labia minora, and vaginal opening differ from one individual to another. Each of these components serves a specific function, playing a role in the reproductive process, sexual activity, and overall health.

The main structures are the labia majora, labia minora, clitoris, urethral opening, and vaginal opening.

- Labia Majora: These are the larger, fleshy outer lips of the vulva, usually covered with pubic hair. They serve to protect the more sensitive internal parts of the vulva, like the clitoris and vaginal opening. A primary function of the labia majora is to shield the internal genital structures from dirt, bacteria, and potential injury. Additionally, they house sweat and sebaceous glands that produce oils to maintain lubrication in the area.

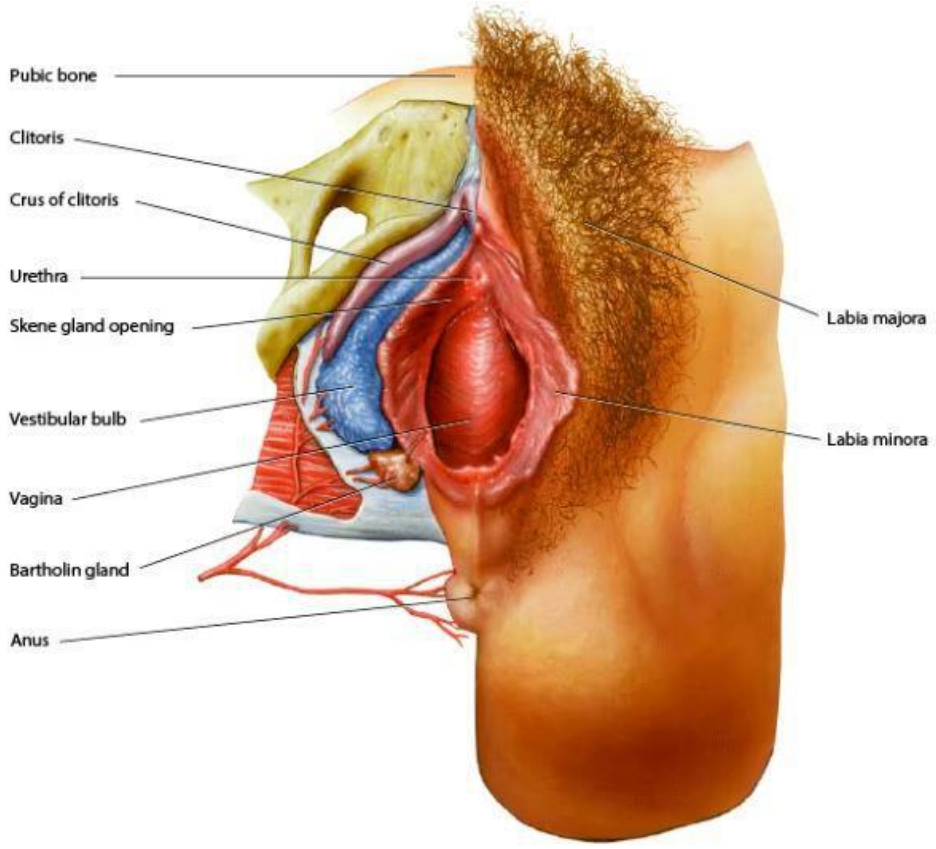
- Labia Minora: They are the smaller, inner folds of skin found beneath the labia majora. These folds are devoid of hair and are rich in blood vessels and nerve endings, which makes them very sensitive to touch and pressure. They play a crucial role in surrounding and protecting the vaginal and urethral openings, acting as a barrier against infection. Their heightened sensitivity also plays a part in sexual pleasure, as they swell with blood during arousal, intensifying the pleasure experienced during sexual activity.

- Clitoris: It is a small, highly sensitive organ located at the top of the vulva, where the labia minora come together. It is regarded as the most crucial organ for female sexual pleasure due to its abundant nerve endings. The clitoris consists of both internal and external parts. The external part, called the glans, is visible and can be easily stimulated. The internal portion extends beneath the surface and is much larger than it seems. During sexual arousal, the clitoris fills with blood, which increases sensitivity and pleasure. While the primary role of the clitoris is to provide sexual pleasure, it also significantly contributes to the overall sexual experience, enhancing intimacy and arousal.

- Urethral Opening: It is situated just below the clitoris and acts as the passage for urine to exit the body. While it does not play a direct role in reproduction, the urethral opening is a significant part of the vulva's anatomy. The urethra, which connects the bladder to the external opening, is generally shorter in females compared to males,

making women more prone to urinary tract infections (UTIs). Thus, maintaining proper hygiene and care is essential for the health of this area.

- Vaginal Opening: It occupies the space just below the urethral opening and serves as the entrance to the vagina, which is the internal canal linking the external genitalia to the uterus. The vaginal opening is a flexible structure that can stretch during sexual intercourse or childbirth. Surrounding it is the hymen, a thin membrane that may partially cover the vaginal opening at birth and is often stretched or torn during a woman's first sexual experience. However, the hymen can also stretch or tear from other activities such as exercise or tampon use, and its presence or absence does not determine virginity.[28]




*Picture 2 External anatomy. Source: MSD Manual, External Female Genital Anatomy.*

[28] Cleveland Clinic, Hymen (last consultation 01 June 2025): https://my.clevelandclinic.org/health/body/22718-hymen

**The Function of the External Reproductive System**

The external female reproductive system serves several important functions in human reproduction, sexual health, and overall well-being. It protects internal organs, enhances sexual pleasure and arousal, and plays a key role in menstruation, conception, and childbirth. Recognizing these functions is essential for promoting sexual health, addressing reproductive concerns, and ensuring proper hygiene and care for this sensitive and crucial part of the body. The external female reproductive system has several important functions that are crucial to a woman's well-being:

- Protection: The external genitalia, which include the vulva, labia majora, labia minora, clitoris, and vaginal opening, serve to shield the internal reproductive organs—such as the vagina, cervix, uterus, and ovaries—from infection and injury. The labia majora, in particular, provide a protective layer for the more delicate inner structures.

- Facilitating Reproduction: It plays a crucial role in enabling conception. During sexual intercourse, the vaginal opening accommodates the penis, which deposits sperm into the vagina. From this point, sperm make their way through the cervix and into the uterus, where they may fertilize an egg in the fallopian tubes.

- Sexual Pleasure: A key function of the external reproductive system is to facilitate sexual pleasure and arousal, especially through the clitoris, one of the most sensitive areas of the human body. This pleasure is not merely a side effect of anatomy; it plays a crucial role in the sexual response cycle, enhancing intimate connections and overall sexual well-being.

- Menstruation: The external reproductive system also aids in the monthly shedding of menstrual blood through the vaginal opening, allowing for the expulsion of the uterine lining. This process is essential for maintaining reproductive health and fertility.

- Childbirth: The vaginal opening is vital during childbirth, as the elasticity of the vaginal walls enables a baby to move from the uterus into the outside world. The perineum supports this process as well, although it can sometimes be at risk of tearing during delivery. After childbirth, the external reproductive system plays a role in recovery and healing as the tissues return to their normal state.

**Changes in the External Female Reproductive System**

The external reproductive system experiences various changes throughout a woman's life, shaped by hormonal shifts, aging, and reproductive health events like menstruation, pregnancy, and menopause.

- Puberty: In puberty, the external genitalia start to mature due to the influence of oestrogen and other sex hormones. The mons pubis becomes more pronounced, pubic hair begins to grow, and both the labia majora and minora develop. The clitoris also becomes more prominent during this period, and sexual sensitivity increases.
- Pregnancy and Childbirth: During pregnancy, the external reproductive system may change with increased blood flow to the vulva, making the area more sensitive. After childbirth, the vaginal opening and perineum may require time to heal, and some women might experience lasting changes in their bodies, such as vaginal laxity or scarring from episiotomy or tears.

- Menopause: As women age and reach menopause, oestrogen levels decrease, which can result in thinning and drying of the vaginal tissues, a condition referred to as vaginal atrophy. The labia may lose some fullness, and sexual function can be affected by physical changes like reduced lubrication and elasticity. In addition, hormonal replacement therapy (HRT), pelvic floor therapy, and laser treatments have become available to address some of these concerns, helping improve quality of life in postmenopausal women.

The external female reproductive system, though frequently overshadowed by its internal counterparts, is vital for women's overall health, sexual function, and reproductive ability. Each part of the external genitalia, from the protective labia to the sensitive clitoris and the

important pathways for menstruation and childbirth, plays a significant role in the intricate nature of human reproduction and sexual well-being.

Throughout a woman's life, the external structures of her reproductive system experience considerable changes due to hormonal fluctuations, pregnancy, and the aging process. Puberty initiates the development of the external genitalia, while pregnancy and childbirth lead to functional adaptations that meet the needs of reproduction. As women enter menopause, the external reproductive system encounters new challenges, such as decreased skin elasticity and vaginal dryness, which may necessitate care to preserve sexual and reproductive health.

Understanding the structure and role of the external reproductive system is essential for both physical health and a more profound comprehension of sexuality and personal autonomy. The external reproductive organs not only fulfil crucial biological roles but also significantly contribute to sexual pleasure and emotional health. The clitoris, especially, exemplifies the deep connection between sexual pleasure and both physiological and emotional well-being. In parallel to comprehending anatomy and physiology, it is important to consider cultural perceptions of the external female reproductive system.

Society's attitudes towards virginity, body image and sexuality have often been influenced by myths and misunderstandings about these body parts. Promoting education, fostering open conversations and raising awareness about sexual health are crucial steps to dismantle stigmas and enable people to value and care for their bodies with confidence.

Health issues concerning the external reproductive system, including infections, discomfort, and various disorders, should be taken seriously. Regular gynaecological check-ups, maintaining good hygiene, and adopting a proactive stance on sexual health are essential for ensuring long-term wellness. Additionally, being aware of and respecting the body's natural changes over time can empower women to navigate health transitions, like menopause, with increased awareness and self-care.

In conclusion, the external female reproductive system is a vital system that significantly affects reproductive health, sexual satisfaction, and overall well-being. Understanding its importance and fostering education about it can empower individuals to take better care of their health and appreciate the intricate nature of their bodies. Promoting a scientifically accurate, stigma-free discourse around female genitalia contributes to dismantling taboos and affirming the value of female anatomy beyond reproduction.

It is essential to continue advocating for improved access to care, education, and resources for women's health, while also confronting the outdated practices and beliefs that have influenced the medical understanding of female genitalia for centuries. As medicine continues to advance, it is equally crucial to integrate cultural competence, respect for bodily autonomy, and inclusive practices to ensure that all individuals receive dignified and equitable reproductive healthcare. The journey of female genital health is still ongoing, and the future promises even greater advancements in inclusivity, autonomy, and scientific development.

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| Bulbi del vestibolo | Piccole formazioni erettili, di forma ovoidale, poste ai lati del vestibolo vaginale che circondano l'orifizio vaginale. | "[…] Il clitoride e i ***bulbi del vestibolo*** sono le strutture che maggiormente aumentano di volume durante l'eccitazione, ma anche le grandi labbra si rigonfiano grazie all'aumentato flusso ematico, e la loro sensibilità agli stimoli tattili incrementa; l'uretra va incontro ad allungamento e l'utero si contrae." | Vestibular bulbs | SIAMS, Società Italiana di Andrologia e e Medicina della Sessualità: https://www.siams.info/androwiki/fisiologia-della-sessualita-femminile/<br><br>Boston University School of Medicine, Sexual Medicine: https://www.bumc.bu.edu/sexualmedicine/physicianinformation/female-genital-anatomy/ |
| Clitoride | Organo erettile femminile, situato nell'angolo anteriore della vulva, che rappresenta una zona erogena dotata di estrema sensibilità grazie all'elevato numero di terminazioni sensitive. | "[…] La piccola apertura direttamente sopra di essa è l'uretra, che è l'apertura dalla vescica. Sotto la vagina si trova l'ano. Sopra l'uretra si trova il ***clitoride***, un corpo di tessuto erettile che è omologo al pene." | Clitoris | Manuale MSD, Versione per i professionisti: https://www.msdmanuals.com/it/professionale/ginecologia-e-ostetricia/disturbi-ginecologici-vari/cisti-del-dotto-di-skene<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/body/22823-clitoris |

This word is derived from the Greek *κλειτορίς -ίδος.*

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| Ghiandole di Skene | Strutture di forma rotonda, situate in profondità nella cute che riveste il vestibolo della vagina. Sono circondate dal tessuto epiteliale che va a costituire parte delle piccole labbra e del clitoride. | "Le ***ghiandole di Skene*** (ghiandole periuretrali o parauretrali) sono localizzate in prossimità dell'uretra distale. […] Le cisti del dotto di Skene si formano se il dotto è ostruito, generalmente a causa di infezioni a carico delle ghiandole. Le infezioni generalmente si verificano nei soggetti adulti." | Skene's glands | Manuale MSD, Versione per i professionisti: https://www.msdmanuals.com/it/professionale/ginecologia-e-ostetricia/disturbi-ginecologici-vari/cisti-del-dotto-di-skene<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/diseases/21892-skenes-gland-cyst |

It was named after the well-known Scottish gynaecologist Alexander Johnston Chalmers Skene (1837–1900), who later moved to the United States and became president of the American Gynaecological Society.

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| Grandi labbra | Pieghe carnose di tessuto che racchiudono e proteggono gli altri organi genitali esterni della donna. | "[…] Le ***grandi labbra*** e il perineo sono rivestiti da cute simile a quella che si trova in tutto l'organismo. Le piccole labbra, invece, sono ricoperte da una mucosa la cui superficie viene mantenuta umida dal liquido secreto da cellule specializzate." | Labia majora | I.R.C.C.S, Ospedale San Raffaele, Gruppo san donato: https://www.hsr.it/cancer-center/tumori/tumore-vulva<br><br>HealthDirect Australia: https://www.healthdirect.gov.au/labia-problems |

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| Imene | Membrana sottile ed elastica, formata da una ripiegatura della mucosa, che circonda e chiude parzialmente l'orifizio vulvo-vaginale. | "[…] Se si rendesse necessaria un'esplorazione vaginale, non si deve aver paura. Il ginecologo ha infatti a disposizione strumenti adatti alla giovane età, che non provocano dolore e lasciano integro l'***imene***." | Hymen | Poliambulatorio Centro Medico Buonarroti: https://www.centromedicobuonarroti.it/approfondimenti/prima-visita-ginecologica-tutto-quello-da-sapere<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/body/22718-hymen |

It derives its etymology from Late Latin *Hȳmēn* and from Greek *ὑμήν -ένος*, meaning 'skin' or 'membrane.'

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| Introito vaginale | Canale d'uscita del sangue mestruale e del neonato durante il parto. | "[…] La posizione consigliata è quella ginecologica, eventualmente con un rialzo sotto la zona lombare. È necessario istruire la persona a localizzare l'***introito vaginale*** per evitare l'errato inserimento nella regione anteriore con eventuale lesione dell'uretra." | Vaginal opening | ISS, Istituto Superiore di Sanità: https://www.iss.it/-/infointersex-altro-supporto<br><br>Mayo Clinic: https://www.mayoclinic.org/healthy-lifestyle/womens-health/in-depth/vagina/art-20046562 |

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| Meato uretrale | Apertura esterna dell'uretra situata in prossimità del vestibolo della vulva. | "[…] L'uretra principale si diparte normalmente dalla vescica, ma poco dopo da questa si origina una uretra accessoria che discende autonomamente verso il proprio ***meato uretrale***. L'uretra principale continua normalmente e indipendentemente da quella accessoria fino al suo originale meato." | Urethral caruncle | Centro di chirurgia ricostruttiva genito-uretrale, Prof. Salvatore Sansalone: https://www.stenosiuretrale.it/uretra-doppia-di-cosa-si-tratta/<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/diseases/22621-urethral-caruncle |

In Italian, it is also referred to as *orifizio uretrale*.

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| Monte di Venere | Accumulo adiposo di forma tondeggiante situato davanti la sinfisi pubica. | "[…] Sono due pliche cutanee, simmetriche, che dal monte di Venere o meglio dalla commessura anteriore scendono in basso descrivendo un semicerchio a convessità esterna, per riunirsi nuovamente nella commessura posteriore o forchetta." | Mons pubis | Centro Medico Sempione, Gruppo Demetra Lifecare: https://www.centromedicosempione.it/anatomia-genitali-esterni-femminili/#:~:text=Genitali%20esterni%20femminili%3A%20il%20monte,la%20maturazione%20sessuale%20(pubarca). <br><br>BCSC, Body Contouring Surgery Clinic: https://bodycontouringsurgery.com.au/abdominoplasty/post-pregnancy-sagging-mons-pubis-and-fatty-upper-pubic-area-fupa/ |

It is also known as the 'Mons Venus' or 'Pubic mound.'

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| Perineo | Muscolo formato da tre strati composti sia da fibre lisce che da fibre striate e che circonda la vagina, la vulva e l'ano. | "[…] Anche quando il periodo espulsivo avviene in modo fisiologico, i muscoli del ***perineo*** sono sottoposti ad un notevole stiramento ed è perciò frequente che esso vada incontro a lesioni che, rimangono latenti, manifestandosi a distanza di anni, compromettendo il normale sostegno dei visceri pelvici." | Perineum | Ordine Interprovinciale della Professione di Ostetrica della Provincia di Brescia: https://www.ostetrichebresciamantova.it/il-pavimento-pelvico.html<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/body/24381-perineum |

It derives from the Greek *περίνεος* or *περίναιος*, meaning 'around.'

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| Piccole labbra | Sottili pieghe cutanee rilevabili su entrambi i lati della vulva. | "[…] Fusione anomala delle ***piccole labbra*** causata dalla progressiva scomparsa degli estrogeni materni. Il trattamento più semplice è l'applicazione di pomate a base di estrogeni." | Labia minora | Ospedale Pediatrico Bambino Gesù: https://www.ospedalebambinogesu.it/sinechie-delle-piccole-labbra-80395/<br><br>NHS, National Health System: https://www.nhs.uk/conditions/cosmetic-procedures/cosmetic-surgery/labiaplasty/ |

It derives from Modern Latin word *labia* 'lips', plural of *labium* 'lip'.

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| Prepuzio clitorideo | Lembo di pelle che circonda il glande clitorideo e che ricopre il clitoride quando questo non è in stato di eccitazione o non viene esposto manualmente. | "[…] Il sigillo si forma tagliando e riposizionando le piccole labbra, o le grandi labbra, a volte tramite cucitura, con o senza rimozione del ***prepuzio clitorideo*** e del glande." | Clitoral hood | Servizio Sanitario Regionale Emilia Romagna: https://www.saperidoc.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/804#:~:text=Tipo%201%3A%20si%20tratta%20della,che%20circonda%20il%20glande%20clitorideo<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/treatments/22259-clitoral-hood-reduction |

In Italian, it is also referred to as *cappuccio clitorideo*.

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| Vestibolo | Area dei genitali esterni femminili compresa tra le piccole labbra, delimitata anteriormente dal clitoride, al quale seguono l'orifizio uretrale e l'orifizio vaginale. | "[…] Il test è molto semplice, chiamato anche Swab Test, si effettua con un semplicissimo cotton fioc, e consiste nell'effettuare con lo stesso una pressione su alcuni punti specifici del ***vestibolo***, se si avverte dolore, probabilmente si è affetti dalla sindrome, ma sarà sempre il medico ad effettuare la diagnosi." | Vaginal vestibule | UFP, Urologia Femminile Padovana: https://www.urologiafemminilepadovana.it/sindrome_vulvo-vestibolare.html<br><br>NVA, National Vulvodynia Association: https://www.nva.org/what-is-vulvodynia/vulvar-anatomy/ |

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| Vulva | Insieme degli organi genitali femminili esterni collocati sotto il monte di Venere. | "[…] La duplicità della ***vulva*** invece, rarissima e a prognosi variabile, dipendente dalle associate malformazioni extraginecologiche a carico di vescica e retto." | Vulva | Centro Medico Sempione, Gruppo Demetra Lifecare: https://www.centromedicosempione.it/anatomia-genitali-esterni-femminili/<br><br>Mayo Clinic: https://www.mayoclinic.org/vulva/img-20005974 |

# Anatomia interna

# Internal anatomy

## The Internal Female Reproductive System

The study of the internal anatomy of the female reproductive system has been a lengthy and evolving journey, marked by centuries of scientific breakthroughs and discoveries. From ancient beliefs to contemporary imaging methods, our comprehension of the female reproductive system has seen remarkable changes. These developments have not only enhanced our knowledge of human biology and reproduction but have also significantly influenced women's health, fertility treatments, and medical practices.

The earliest theories about human reproduction can be traced back to ancient civilizations. In places like ancient Egypt, Greece, and Rome, there was a significant misunderstanding and misrepresentation of women's reproductive organs, often viewing the female body as merely a passive vessel for male semen. For example, the Greek physician Hippocrates (460–370 BCE) held the belief that women's reproductive organs were fundamentally different from men's, suggesting that the uterus[29] was a "wandering" organ that could shift within the body, leading to various health issues for women. This perspective endured for many centuries, highlighting the limited anatomical knowledge of the time.

It was not until the Middle Ages and the Renaissance that more in-depth anatomical studies started to take shape. Early dissections of the human body, typically conducted by male physicians, began to uncover more information about the female reproductive organs. However, societal taboos and restrictions surrounding the study of female anatomy hindered further advancements.

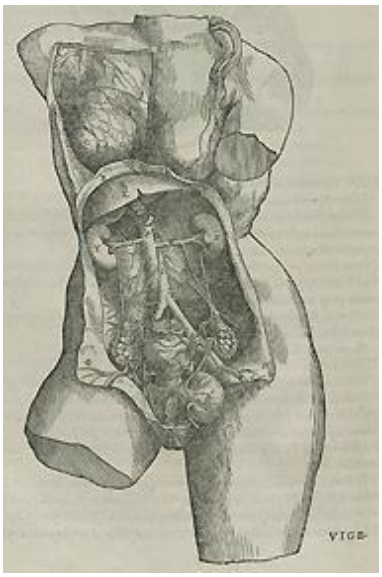
The Renaissance marked a pivotal time for understanding the internal anatomy of the female reproductive system, driven by a revived interest in human anatomy. A key figure during this era was Andreas Vesalius, a 16th-century Flemish anatomist and physician.[30] He is

[29] Potter, P. (Ed. & Trans.). (2018). *Hippocrates: Diseases of Women 1–2* (Loeb Classical Library No. 538). Harvard University Press.

[30] In 1537, he earned his medical degree from the University of Padua, where he was immediately appointed professor of surgery and anatomy at just 23 years old. His magnum opus, *De Humani Corporis Fabrica Libri Septem*, presented the most accurate and detailed anatomical drawings of the human body up to that time, correcting over 200 errors in the works of Galen.

widely recognized for his contributions to human dissection and for creating more precise anatomical illustrations. His seminal work, *De humani corporis fabrica* (1543),[31] provided detailed depictions of the female body, highlighting the ovaries, fallopian tubes, uterus, and vagina.

Despite this, Vesalius's dissections mainly concentrated on the male body, which meant that his in-depth studies of female reproductive anatomy were somewhat restricted. It was not until the late 16$^{th}$ and early 17$^{th}$ centuries that more direct observations of female anatomy emerged, thanks to improved dissection techniques and the efforts of pioneering physicians.



*Picture 3 The female pelvic anatomy. From Andreas Vesalius' De Corporis Humani Fabrica, 1543. 3. Source: Natinal Library of Medicine, Hisotry of Medicine. Cesarean Section - A Brief History*

[31] Vesalius, A. (1514–1564). *De humani corporis fabrica libri septem* [On the fabric of the human body in seven books]. Basel: Johannes Oporinus. Illustrations by Jan Stephan van Calcar.

**Discovery and Scientific Advances in the Internal Anatomy**

A significant milestone in understanding the female reproductive system was the identification of the ovaries' role in reproduction. Although the ancient Greeks speculated about the presence of female reproductive organs, it was not until the 17th and 18th centuries that scientists started to grasp how the ovaries function in egg production.

In the early 17th century, Regnier de Graaf,[32]a Dutch physiologist, made significant advancements in understanding the function of the ovaries. Through dissections and meticulous observations, he discovered Graafian follicles—structures in the ovaries that contain the eggs. His research laid the foundation for recognizing that the ovaries are responsible for producing and releasing eggs, a process that would later be termed ovulation. The understanding of ovulation did not come into focus until the 19th century. In the 1820s, German biologist Karl Ernst von Baer[33] made significant discoveries, revealing that female animals produce eggs in their ovaries, which are then fertilized by male sperm. This was a pivotal moment in the evolution of fertilization theory and a significant advancement in the scientific comprehension of reproduction.

For instance, the fallopian tubes play a crucial role in female reproduction, and our understanding of them has evolved significantly over time. Initially, these tubes, which link the ovaries to the uterus, were believed to have minimal importance in fertilization. However, during the mid-19th century, researchers started to realize that fertilization usually takes place within the fallopian tubes. These tubes can be likened to biological highways, allowing for the transit of the ovum toward the uterus.

[32] Regnier de Graaf was a Dutch physician and anatomist who made key discoveries in reproductive biology. He is best known for his work on the female reproductive system, particularly his identification and description of ovarian follicles, now known as Graafian follicles. In his 1672 work, *De Mulierum Organis Generatione Inservientibus*, he provided the first thorough description of the female gonad and established that it produced the ovum.

[33] Karl Ernst von Baer, a pioneering embryologist, made groundbreaking contributions to reproductive biology in the early 19th century. In his 1827 work, *De ovi mammalium et hominis genesi*, he identified the mammalian ovum within the ovarian follicles, challenging prevailing theories of reproduction.

The lining of the fallopian tubes is covered in cilia, which move rhythmically to assist the journey of the egg. If the structure or function of these tubes is compromised—due to infection, scarring, or congenital anomalies—it can result in infertility or increase the risk of ectopic pregnancy.

One of the key figures in this discovery was William Harvey,[34] the English physician best known for his work on the circulation of blood. In the 17th century, he carried out extensive studies on how embryos develop in mammals, and his findings supported the idea that fertilization takes place in the fallopian tubes. Along with improvements in microscopic techniques, Harvey's work eventually led to the realization that the fallopian tubes are where sperm and egg come together, a discovery that continues to influence fertility research and treatments today.

The internal anatomy of the uterus was another area that saw major advances in understanding. While it was already recognized as the organ responsible for carrying and nurturing the fetus during pregnancy, the intricate hormonal regulation of the menstrual cycle was not fully understood until the 19th and 20th centuries.

In the late 19th century, researchers such as Pierre Flourens and Ernst Starling[35] started to clarify how hormones influence reproduction. Starling's studies on hormones were crucial in establishing the connection between the ovaries, uterus, and other reproductive organs. This research ultimately contributed to the understanding of the menstrual cycle, which encompasses menstruation, ovulation, and the luteal phase, all regulated by varying levels of oestrogen and progesterone.

[34] William Harvey (1578–1657) was an English physician renowned for his discovery of the full circulation of blood in the human body. In 1628, he published *Exercitatio Anatomica de Motu Cordis et Sanguinis in Animalibus* (An Anatomical Exercise on the Motion of the Heart and Blood in Animals).

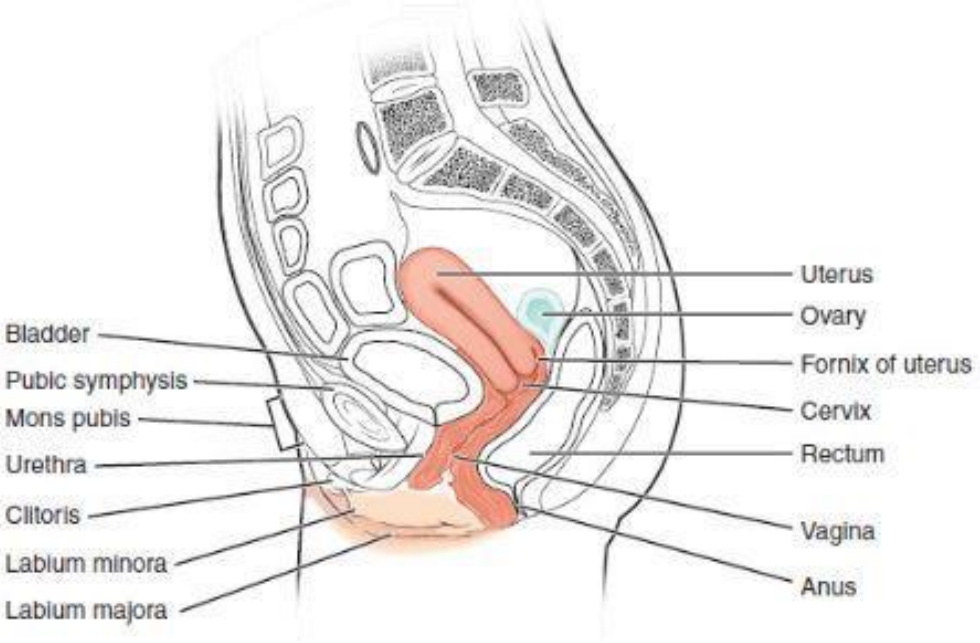
[35] In the late 19th century, researchers such as Pierre Flourens and Ernest Starling began to elucidate the role of hormones in reproduction. Tata, J. R. (2005). One hundred years of hormones. EMBO Reports, 6(6), 490–496.

In the early 20th century, Theodore H. Bullock[36] and his colleagues delved deeper into the physiological mechanisms of the menstrual cycle. They uncovered the feedback loops involving the hypothalamus, pituitary gland, ovaries, and uterus that play a crucial role in regulating the female reproductive system.

In the 20th and 21st centuries, advancements in medical technology transformed our comprehension of the internal female reproductive system. A major breakthrough in reproductive science was the creation of ultrasound imaging, enabling scientists and doctors to see the ovaries, fallopian tubes, and uterus in real time. These technologies have proven instrumental in the diagnosis and treatment of reproductive disorders, as well as in guiding procedures in Assisted Reproductive Technologies (ART) such as In Vitro Fertilization (IVF).

The discovery and scientific advances in the understanding of the internal female reproductive system have been both gradual and transformative. Early misconceptions about female anatomy have given way to significant discoveries regarding ovarian function, fertilization, and hormonal regulation. This scientific exploration has greatly enhanced our comprehension of reproduction. With the advent of modern medical imaging and technologies, we have not only broadened our knowledge but also developed new solutions for women dealing with fertility issues. As research progresses, the internal female reproductive system will continue to be a vital focus, providing fresh insights into women's health and the future of reproductive medicine.

[36] Theodore Holmes Bullock (1915–2005) was a prominent American neurobiologist best known for his pioneering work in neuroethology, comparative neurobiology, and the electrical activity of the nervous system, especially in non-human and invertebrate species. *Structure and Function in the Nervous Systems of Invertebrates* (Vols. 1–2). San Francisco: W. H. Freeman and Company.




*Picture 4 Female reproductive system, (lateral view). Source: OER Services, Anatomy and Physiology of the Female Reproductive System*

## Anatomy

The internal female reproductive system is a complex and essential network of organs that plays a crucial role in sexual reproduction, fertility, and overall health in women. This system consists of several interconnected structures responsible for various processes, including egg production, fertilization, nurturing and developing a foetus during pregnancy, and the expulsion of the foetus during childbirth.[37] Hormonal regulation is closely linked to the functioning of the internal female reproductive system, which is also influenced by both physiological and environmental factors.

The uterus is connected to the upper third of the vagina, the cervix, and both fallopian tubes.

[37] Cleveland Clinic, Female Reproductive System. (Last Consultation: 02 June 2025): https://my.clevelandclinic.org/health/articles/9118-female-reproductive-system

These organs function together in a coordinated manner to facilitate the female reproductive cycle and support conception.

An analysis of the anatomical functions of the internal reproductive system is paramount in order to understand its relevance:

- Ovaries: They are two small organs located on either side of the uterus in the pelvic cavity. They serve two main purposes: producing eggs and secreting hormones.
  Each ovary holds thousands of immature eggs, known as oocytes, which are present from birth. Throughout a woman's reproductive years, typically beginning at puberty and lasting until menopause, one egg matures and is released from an ovary roughly once a month in a process called ovulation. The ovaries also produce sex hormones—mainly oestrogen and progesterone—that regulate not only the menstrual cycle but also affect many systems in the body, such as bone strength and cardiovascular function.

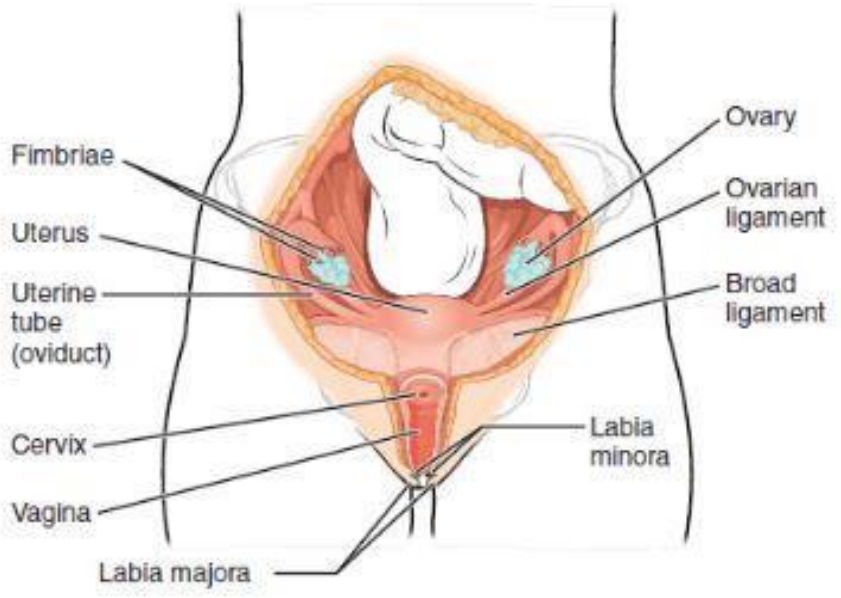
- Fallopian Tubes: There are two slender tubes that connect each ovary to the uterus. These tubes act as the route for the egg as it moves from the ovary to the uterus. The inner lining of the fallopian tubes is lined with tiny, hair-like structures known as cilia, which assist in guiding the egg toward the uterus. Additionally, the fallopian tubes are where fertilization usually takes place. When sperm enters the female reproductive system during intercourse, it can travel through the uterus and into the fallopian tubes, where it may encounter the egg for fertilization. The fallopian tubes play a crucial role in conception, as they provide the pathway for the egg and sperm to meet. If the fallopian tubes are blocked or damaged, it can result in infertility, highlighting their importance in female reproductive health.

- Uterus: It is a muscular, hollow organ located in the pelvic cavity between the bladder and the rectum. Its main role is to house and nurture a developing foetus throughout pregnancy, providing a secure environment for the fertilized egg to implant, grow,

and develop. Each month, the lining of the uterus, called the endometrium, thickens in preparation for the potential implantation of a fertilized egg. If fertilization does not happen, this lining is shed during menstruation. However, if pregnancy does occur, the fertilized egg attaches to the endometrium, and the uterine lining continues to nourish and protect the growing embryo. Hormonal signals from the ovaries regulate the cyclical changes of the endometrial lining, coordinating with ovulation.

- Cervix: It is the lower part of the uterus that extends into the vagina. It acts as a passageway between the uterus and the vagina and has several important roles. During menstruation, the cervix allows the endometrial lining to flow into the vagina. During sexual intercourse, it produces cervical mucus, which can either help or block the movement of sperm, depending on the phase of the menstrual cycle. The cervix is essential during both pregnancy and childbirth. In labour, it dilates to enable the baby to move through the birth canal. Additionally, the cervix helps seal the uterus throughout pregnancy, protecting against infection and premature labour. Cervical health is also a focus of preventive medicine, especially in relation to screening for cervical cancer through Pap smears and HPV testing.

- Vagina: A flexible tube connects the cervix to the external genitalia. The vagina serves several functions, including passage for menstrual flow, a receptacle for sperm, birth canal. The vagina is lined with mucous membranes that offer lubrication and help protect against infections. Its ability to stretch makes it possible to accommodate sperm during intercourse and, later, a baby during childbirth. It also maintains an acidic environment that serves as a natural defence mechanism against harmful bacteria.




*Picture 5 Female reproductive system, (internal view). Source: OER Services, Anatomy and Physiology of the Female Reproductive System.*

**Functions of the Internal Female Reproductive System**

The internal female reproductive system is essential for reproduction, encompassing everything from the production of eggs to providing support for a developing foetus during pregnancy. Each organ within this system has a distinct role that aids in the process of human reproduction.

The ovaries are responsible for producing eggs, also known as oocytes, which are released during the process of ovulation. This typically happens about once a month throughout a woman's reproductive years. Once released, the egg can be fertilized by sperm. Without the ovaries and the release of eggs, reproduction would not be feasible. In addition to oocyte production, the hormonal activity of the ovaries ensures the regularity of the menstrual cycle and impacts overall systemic health.

Fertilization usually takes place in the fallopian tubes, where the sperm encounters the egg. The fallopian tubes serve as a route for the sperm to reach the egg and for the fertilized egg to make its way back to the uterus for implantation.[38]

This process is crucial for conception and signifies the start of pregnancy. If fertilization takes place, the fertilized egg attaches itself to the uterine lining, starting its journey of development into an embryo and later a foetus. The uterus creates a supportive environment for the growing foetus, offering essential nutrients, oxygen, and protection. The cervix is vital in keeping a sealed environment throughout pregnancy, safeguarding the foetus from potential infections.

Of course, if pregnancy does not happen, the lining of the uterus is expelled during menstruation. This process prepares the uterus for the next cycle of ovulation and the possibility of fertilization.

Conversely, during labour, the cervix opens up, and the uterus contracts to assist in pushing the baby out through the vagina. The vagina acts as the birth canal, while the internal reproductive system works together to ensure the baby is delivered safely. Additionally, the complex hormonal and neural signaling that orchestrates labour demonstrates the remarkable coordination of multiple organ systems.

Ultimately, the internal female reproductive system consists of a complex arrangement of organs that collaborate to facilitate reproduction. Starting with the ovaries, which produce eggs, to the uterus that offers a nurturing environment, each organ plays a vital role in conception, pregnancy, and childbirth. Gaining insight into the anatomy and functions of this system is essential for understanding human reproduction, ensuring reproductive health, and addressing any medical issues that may arise concerning fertility, pregnancy, and childbirth.

[38] Healthline, Where does fertilization occur. (Last Consultation: 02 June 2025): https://www.healthline.com/health/where-does-fertilization-occur

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|---|---|---|---|---|
| Cervice uterina | Parte inferiore dell'utero che delimita il passaggio tra il corpo uterino e la vagina. | "[…] Il medico inserirà delicatamente in vagina uno strumento chiamato speculum; per osservare la ***cervice uterina*** utilizzerà un microscopio dotato di luce, chiamato colposcopio, che consente di osservare vagina e cervice uterina come se si utilizzasse una sorta di binocolo." | Uterine cervix | CEMER, Centro Europeo per la Medicina e la Ricerca: https://cemer.eu/colposcopia/<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/body/23279-cervix |

It is also called "neck of the womb". In Italian, *collo dell'utero*.

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|---|---|---|---|---|
| Corpo dell'utero | Parte superiore e centrale dell'utero la quale contiene l'orifizio interno. | "[…] Secondo il sistema di classificazione della FIGO, tutti i tumori del ***corpo dell'utero*** possono essere distinti in quattro stadi a seconda del loro grado di diffusione nell'organismo." | Body of the uterus | ISS, Istituto Superiore di Sanità: https://www.issalute.it/index.php/la-salute-dalla-a-alla-z-menu/t/tumore-dell-utero<br><br>WHO, International Agency for Research on Cancer: https://screening.iarc.fr/atlasviadetail.php?Index=9&e |

In Italian, it is also referred to as *corpo uterino*.

| | | | | |
|---|---|---|---|---|
| Endometrio | Parte più interna dell'utero rivolta verso la cavità uterina. | "[…] Se necessario, la procedura permette anche di effettuare una biopsia dell'***endometrio***, ovvero di prelevare un lembo di tessuto per una valutazione istologica." | Endometrium | Fondazione Poliambulanza, Istituto Ospedaliero No Profit: https://www.poliambulanza.it/esami-visite/patologie/tumore-dell-endometrio<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/diseases/10857-endometriosis |
| Ghiandole di Bartolini | Strutture di forma ovale molto piccole, che si trovano nella vulva, la cui principale funzione è quella di secernere un liquido che permette la lubrificazione vaginale durante i rapporti sessuali. | "La bartolinite è l'infiammazione delle ***ghiandole di Bartolini*** che permettono la lubrificazione vaginale durante i rapporti sessuali: l'analisi dei sintomi, delle cause e del percorso di cure più efficace." | Bartholin's glands | IRCCS, Università Cattolica del Sacro Cuore, Fondazione Policlinico Universitario Agostino Gemelli: https://privato.policlinicogemelli.it/approfondimenti/bartolinite/<br><br>Mayo Clinic: https://www.mayoclinic.org/diseases-conditions/bartholin-cyst/symptoms-causes/syc-20369976 |

These formations are named after Caspar Bartholin the Younger, a distinguished Danish physician (1655-1738) who first described them.

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| Legamento sospensore | Struttura peritoneale formata da vasi ovarici che si originano dalla regione lombare. | "[…] Il ***legamento sospensore*** dell'ovaio costituito da una piega peritoneale connessa alla porzione superiore della faccia laterale dell'ovaio; contiene fibre connettivali e muscolari lisce, arteria ovarica, vene ovariche e nervi ovarici; termina nella fascia del muscolo grande psoas." | Suspensory ligament | Fertility Center, Informazioni Scientifiche, Dr. Vincenzo Volpicelli: https://www.fertilitycenter.it/anatomia/ovaio-anatomia<br><br>RSNA, Radiology Society of North America, M. Kaniewska, P. Gołofit, M. Heubner, C. Maake, R. A. Kubik-Huch, 2018, Suspensory Ligaments of the Female Genital Organs: MRI Evaluation with Intraoperative Correlation: https://pubs.rsna.org/doi/10.1148/rg.2018180089#:~:text=The%20suspensory%20ligament%20of%20the%20ovary%20provides%20the%20superior%20border,and%20lymphatic%20vessels%20(34) |

In Italian, it is referred to as the *lombo ovarico* or *infundibolo pelvico*.

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| Membrane amniocoriali | Struttura fetale che avvolge il feto durante la vita uterina. Si tratta di membrane formate da due strati, lo strato più interno chiamo "amnio", che contiene il liquido amniotico, e lo strato più esterno chiamato corion" . | "[…] Si tratta di una glicoproteina della matrice extracellulare prodotta dal corion con ruolo di collante fra le ***membrane amniocoriali*** e la decidua e presente nel liquido amniotico, nel tessuto placentare e nelle decidua basale." | Amniochorionic membranes | Dott. Luigi Cetta, Infertilità e Management della gravidanza: https://www.luigicettaginecologo.it/minaccia-parto-pre-termine-roma-eur/<br><br>Fetal Membrane Society: https://www.fetalmembranesociety.org/fetal-membranes |

They are also known as 'fetal membranes' or just 'membranes'.

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| Miometrio | Parte muscolare media dell'utero la quale è rivestita internamente dall'endometrio ed esternamente dal perimetrio. | "Nell'adenomiosi uterina il tessuto endometriale ectopico si infiltra nel ***miometrio***. Ciò tende a indurre un aumento di volume diffuso dell'utero." | Myometrium | Manuale MSD, Versione per professionisti: https://www.msdmanuals.com/it-it/professionale/ginecologia-e-ostetricia/disturbi-ginecologici-vari/adenomiosi-uterina<br><br>University of Rochester, Medical Center: https://www.urmc.rochester.edu/encyclopedia/content.aspx?ContentTypeID=34&ContentID=17114-1 |

It is a compound word originating from myo, Late Latin *metrium*, and the Greek word μήτρα 'womb'.

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|---|---|---|---|---|
| Ovaie | Organo nel quale avvengono la produzione e la maturazione delle cellule uovo. | " […] Le ***ovaie*** sono due piccoli organi pari e simmetrici, situati nella cavità pelvica ai lati dell'utero con cui comunicano attraverso le tube di Falloppio." | Ovaries | Unità Ginecologica Ostetrica, Centro di fecondazione assistita di 1°livello. Dott. Vito Pizzo: https://www.ginecologiaostetriciapizzo.it/genitali-femminili-interni-le-ovaie/<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/body/22999-ovaries |

In Italian, it is referred to as the *gonadi*.

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| Ovocito | Cellula germinale che si origina a seguito di una meiosi per accrescimento da parte di un ovogonio. | "[…] In questa fase la maturazione si arresta nuovamente alla metafase della seconda divisione meiotica e continuerà (dimezzando ancora il DNA e portandolo a 23 cromosomi) solo se l'***ovocita*** in questa fase verrà fecondato." | Egg cell | Studio Medico Landino: https://www.studiomedicolandino.it/blog-news/25-gli-ovociti-cosa-sono-e-come-avviene-la-loro-maturazione.html<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/articles/9118-female-reproductive-system |

It is also called 'oocyte' or 'ovum'. In Italian, it is known as *oocita* or *cellula uovo*.

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| Perimetrio | Rivestimento dell'utero localizzato sul peritoneo viscerale. | " […] L'utero è costituto da uno strato esterno in continuità con la cavità peritoneale, il ***perimetrio***, uno intermedio composto da tessuto muscolare liscio, il miometrio e infine dallo strato più interno, l'endometrio." | Perimetrium | Gruppo Synergo: https://www.gruppsynergo.com/endometriosi-cose-e-come-si-cura/<br><br>TWC, The woman's Clinic: https://twc-ms.com/uterine-fibroids-types-symptoms-causes/ |

It is a compound word, from the prefix peri- and the Greek word *μήτρα* 'womb'.

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|---|---|---|---|---|
| Tube di Falloppio | Condotti simmetrici che connettono le ovaie con l'utero. | "La sonoisterosalpingografia prevede l'utilizzo di uno speculum, per permettere l'inserimento agevole di una schiuma in gel che scorre nelle ***tube di Falloppio*** e nella cavità addominale." | Fallopian tubes | IRCCS, Università Cattolica del Sacro Cuore, Fondazione Policlinico Universitario Agostino Gemelli: https://privato.policlinicogemelli.it/approfondimenti/sonoisterosalpingografia/<br><br>Mayo Clinic: https://www.mayoclinic.org/diseases-conditions/female-infertility/expert-answers/pregnancy/faq-20058418 |

In Italian, they are also reffered to as *salpingi* or *ovidutti*.

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| Uretere | Condotto muscolomembranoso che si origina dai reni sino alla vescica. | "[…] Le stenosi ureterali consistono in restringimenti del calibro dell'***uretere*** tali da ostacolare il normale deflusso dell'urina con conseguente dilatazione del rene interessato." | Ureter | Gruppo Ospedaliero Leonardo, Policlinico Abano: https://policlinicoabano.it/unita-operative/urologia-operativa/chirurgia-robotica/stenosi-delluretere/<br><br>AJOG, American Journal Obstetrics and Gynecology, J. K. Chan, J. Morrow, A. Manetta, 2003, *Prevention of ureteral injuries in gynecologic surgery*: https://www.ajog.org/article/S0002-9378(03)00099-1/fulltext |

It derives from the Greek *οὐρητήρ*, a derivative of *οὐρέω*, 'to urinate'.

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| Uretra | Condotto che collega la vescica all'esterno costituendo l'ultima parte delle vie urinarie. | "[…] I principali disturbi dell'apparato urinario femminile sono riconducibili a problematiche dell'***uretra***, anche se a causa della sua brevità questi possono trasmettersi alla vescica e ai reni più facilmente che negli uomini." | Urethra | Seno Clinic Roma, Centro di Senologia Multidisciplinare: https://www.senoclinicroma.com/blog/ginecologia/disturbi-dellapparato-urinario-femminile.html<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/body/23002-urethra |

It derives from the Late Latin *urēthra*, and the Greek *οὐ-ρήϑρα*.

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| Utero | Organo muscolare femminile deputato ad accogliere l'embrione in sviluppo. Durante la gravidanza subisce un aumento fino a quaranta volte le sue dimensioni. | "[…] L'aumento di peso e di volume dell'***utero*** provoca una serie di modificazioni nella distribuzione del peso e dell'equilibrio della gestante, che è indotta ad arcuare la parte inferiore della schiena." | Uterus | Ministero della Salute: https://www.salute.gov.it/portale/donna/dettaglioContenutiDonna.jsp?lingua=italiano&id=4478&area=Salute%20donna&menu=nascita<br><br>Canadian Cancer Society: https://cancer.ca/en/cancer-information/cancer-types/uterine/what-is-uterine-cancer/the-uterus |

It derives from the Latin *utĕrus*, cf. with Sanskrit *udáram*, meaning 'belly'. In English is also 'womb'.

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| Vagina | Organo copulatore femminile, formato da un canale muscolo-membranoso che si estende dalla vulva all'utero. | "[…] Il bacino osseo è chiuso inferiormente da una struttura fibro-muscolare di primaria importanza, denominata pavimento pelvico, che è attraversata dalle parti terminali degli apparati genito-urinari e intestinali cioè uretra, ***vagina*** (nella donna) e retto." | Vagina | Riabilitazione del Pavimento Pelvico, Dr.ssa Alessandra Marchi, Ostetrica: https://www.ilpavimentopelvico.it/pavimento-pelvico/cenni-di-anatomia-pelvica<br><br>Mayo Clinic: https://www.mayoclinic.org/healthy-lifestyle/womens-health/in-depth/vagina/art-20046562 |

# Tipologia di parto

# Types of childbirth

**Evolution of childbirth**

The way we approach childbirth has changed significantly over time, influenced by improvements in medical understanding, technological advancements, and shifts in cultural perspectives on the birthing process.

The history of childbirth has evolved significantly, influenced by a blend of traditional practices from early human societies and the modern, technology-driven approaches we see today.[39] The approaches to delivering babies have evolved to focus on ensuring the health and safety of both mothers and their infants.

This evolution reflects a complex interaction between cultural traditions, scientific advancements, and changes in society.

The growing range of options has empowered women to make informed choices about their childbirth experiences like never before. Although childbirth will always be a deeply personal and meaningful event, advancements in modern medicine are enhancing its safety and outcomes, offering mothers and babies improved prospects for health and well-being.

The choice of delivery method is a highly personal decision shaped by various factors, such as medical considerations, the mother's preferences, and the baby's health.

The primary focus should always be the health and safety of both the mother and the baby. Expecting parents need to collaborate closely with their healthcare providers to establish the most suitable plan for their unique situation, remaining flexible to adjust that plan as circumstances change.

Childbirth has seen remarkable transformations over the course of human history. The transition from home births to hospital deliveries, the evolution of caesarean sections, and the growing influence of technology and pain management highlight not just advancements in medicine but also shifts in societal attitudes, cultural norms, and scientific understanding.

[39] Trevathan, W. R. (2013). *Human birth: An evolutionary perspective*. In Muehlenbein, M. P. (Ed.), Human evolutionary biology (pp. 105–131). Cambridge University Press.

In numerous ancient cultures, childbirth was accompanied by various rituals and customs designed to safeguard both the mother and the child.[40] In certain societies, the act of giving birth was considered a sacred event, with prayers and offerings presented to deities for the protection of the mother during labour.

These traditions highlighted the profound cultural and spiritual importance of childbirth in early communities.

In the 16th and 17th centuries, obstetrics started to develop as a separate area of medicine. The focus on childbirth transitioned from midwives to male doctors, who began using medical knowledge to assist in the process. However, even with these advancements, childbirth continued to be a risky and often perilous experience, especially for women in lower-income communities who had limited access to medical care.

By the 18th century, hospitals started to take on a more significant role in childbirth. In Europe, these institutions evolved into centres for medical care, where women began to deliver their babies under the watchful eye of doctors instead of relying on midwives at home. However, this shift faced pushback, as many women still favoured the comfort and familiarity of home births. While hospitals provided sterile environments and the assurance of medical intervention in case of complications, they also symbolized the increasing dominance of medical authority in the childbirth process.

One of the major advancements in childbirth during the 19th century was the introduction of anaesthesia. In 1847, Scottish obstetrician James Young Simpson was the first to use chloroform to alleviate pain during labour. This was soon followed by the use of ether and, later on, epidural anaesthesia in the 20th century. Anaesthesia transformed the childbirth experience, making it more manageable for many women and lessening the fear and trauma linked to pain.

Many women today are choosing less invasive methods for childbirth, aiming to embrace more natural and holistic practices.

[40] Rituals and rites of childbirth across cultures. In M. Cheyney & R. Davis-Floyd (Eds.), *The Routledge Handbook of Midwifery* (pp. 589–604). Routledge.

This approach has found great acceptance over the years. For instance, breathing has played a significant role and following this trail the 'Lamaze method'[41] was created in the 1950s by French obstetrician Fernand Lamaze, promotes natural childbirth while minimizing medical intervention. This technique of relaxation and the labour assistance help the mother to cope with pain and stress during labour. The Lamaze method played a significant role in promoting the belief that women could experience childbirth with reduced dependence on pain relief and surgical procedures. Technological development in science has certainly also had a great impact on women's reproductive and gynaecological health.

In the 21st century, technology has significantly transformed obstetrics and the process of childbirth. Advances like ultrasound and telemedicine have enhanced the safety and accuracy of delivering babies. The use of ultrasound for monitoring foetal development and position has become a standard practice in prenatal care. It enables doctors to evaluate the baby's growth, identify potential complications, and decide on the most appropriate delivery method. Continuous foetal monitoring during labour, typically through electronic foetal heart rate monitoring, helps healthcare providers keep track of the baby's well-being in real-time.

*Picture 6 Moment immediately after delivery. Source: Mom Gives Birth, Nice Time Page, YouTube*

[41] Healthline, Lamaze Breathing. (Last Consultation: 02 June 2025): https://www.healthline.com/health/lamaze-breathing?_

On the other hand, the COVID-19 pandemic significantly boosted the adoption of telemedicine in obstetrics, making virtual consultations and prenatal care increasingly prevalent. This technology provides expectant mothers with enhanced flexibility and improved access to healthcare, especially in rural or underserved regions.

Nowadays, there are various delivery methods that address different medical situations, personal preferences, and cultural traditions. Each method has its unique benefits, risks, and factors to consider. Understanding the various types of delivery can assist expectant parents in making informed choices about their birth plan, with support from healthcare professionals.

The most common types of childbirth delivery include vaginal birth, caesarean section (C-section), water birth, Trial of Labour After Caesarean (TOLAC) or Vaginal Birth After Caesarean (VBAC) and breech delivery.

**Viginal Birth**

Vaginal birth is the most natural and widely preferred method of delivery. It takes place when the baby is born through the birth canal, which is the vaginal opening. This type of delivery can be of two types: Spontaneous Vaginal Delivery (SVD) and Assisted Vaginal Delivery (AVD).

The main distinction between SVD and AVD lies for assistance needed during the second stage of labour. SVD refers to the natural, unassisted delivery of the baby, whereas AVD utilizes tools such as forceps or a vacuum extractor to aid in the delivery process. AVD is typically employed when labour is not progressing as anticipated or when there are concerns regarding the health of the mother or baby. Each method carries its own risks and benefits; however, SVD is usually favoured due to its lower risk and faster recovery, while AVD may be necessary to prevent more serious complications, such as a caesarean section.

In a typical vaginal birth, labour starts naturally, with the cervix slowly dilating and effacing to enable the baby to move through the birth canal. The mother goes through different stages of labour, which include early, active, and transition phases. When the cervix is fully dilated to 10 cm, she starts pushing, and that is when the baby is delivered.

Complications during vaginal delivery can sometimes necessitate assistance. This assistance may come in the form of forceps or a vacuum extractor. These instruments are used to help guide the baby through the birth canal when the mother's pushing is not enough or if the baby's position poses difficulties, such as when the baby is in distress or not descending as expected.

There are several benefits to vaginal birth: mothers typically experience shorter hospital stays and faster recovery times, while babies have a reduced risk of respiratory problems since being delivered through the birth canal helps clear fluid from their lungs. Additionally, vaginal birth generally poses a lower risk of infection compared to a C-section.

Likewise, there are challenges, issues, and risks: Longer labour and increased pain during delivery can lead to potential perineal tearing or other birth injuries. In some cases, vaginal birth may not be feasible due to medical complications such as foetal distress, breech position, or placenta praevia.

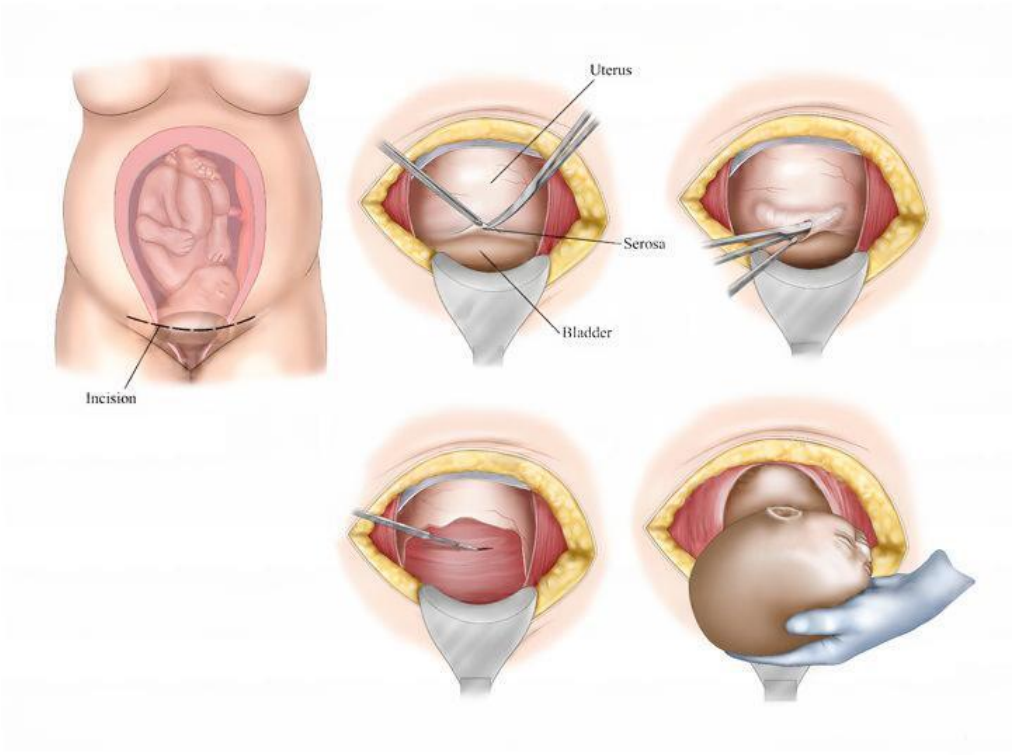
**Caesarean Section (C-Section)**

The early history of caesarean section is still clouded in myth and questionable accuracy. The origin of the term "caesarean" appears to have been distorted over the years. Many believe it comes from the surgical birth of Julius Caesar, but this seems improbable since his mother, Aurelia, is said to have lived long enough to learn about her son's invasion of Britain.

C-section is a surgical procedure where the baby is delivered through an incision in the mother’s abdomen and uterus. Although vaginal birth is usually the preferred option, C-sections may be required when complications occur that pose risks to either the mother or the baby.

While early attempts at caesarean sections were often fatal for both the mother and the child, the technique evolved over time, becoming a life-saving procedure for women with high-risk pregnancies.

Situations such as placenta praevia, multiple pregnancies, or the baby being in a breech position may require a scheduled C-section. For women with conditions like placenta praevia or specific pelvic abnormalities, a caesarean section can help avoid birth injuries, such as uterine tears, excessive bleeding, or harm to the baby during a challenging vaginal delivery.




*Picture 7 C-Section procedure. Source: Illustrated Verdiet.*

If a previous C-section was done, a repeat C-section may be suggested to reduce the risks of uterine rupture that can occur during a vaginal birth. In some cases, a C-section may be required during labour because of unexpected complications. This may involve foetal respiratory issues, prolonged labour or problems with the placenta. An emergency C-section can be crucial for the safety of both the mother and baby when complications occur.

In situations where vaginal delivery could lead to serious risks, a C-section can help avoid major complications. It can also be crucial in situations of severe foetal distress or umbilical cord prolapse, where the baby's oxygen supply is at risk. When the foetus is in distress, a C-section may be necessary to swiftly deliver the baby, reducing the risk of serious complications like brain injury or stillbirth. In a different case, when shoulder dystocia is expected or if complications occur during delivery, a C-section might be the safest choice. This procedure prevents the baby's shoulders from being stuck in the birth canal and lowers the risk of injury for both the baby and the mother.

For instance, if the baby is positioned breech or if the mother is facing a uterine rupture, opting for a caesarean delivery might be the safest choice for both the mother and the baby.

While C-section offers certain advantages, it also comes with risks that can affect both the mother and the baby. For mothers, recovering from a caesarean section typically takes longer and can be more painful than recovering from a vaginal birth. They might experience increased pain, need more potent pain relief, and have a longer hospital stay.

Babies born via caesarean section might face respiratory problems because they do not undergo the natural compression of the birth canal, which aids in clearing fluid from their lungs. Moreover, there is also an increased risk of injury during the procedure, including potential cuts to the baby's skin.

**Water Birth**

Water birth has become an increasingly popular alternative delivery method in recent years. This approach allows the mother to labour and give birth in a pool of warm water. Supporters believe that the buoyancy of the water can help alleviate pain and stress, while the warmth creates a calming and comforting atmosphere. Water birth is viewed as a method to create a more natural and soothing birthing experience. This practice has deep historical roots, with indications that water births took place in ancient cultures like those of Egypt and Greece.

However, the concept of water birth as we recognize it today gained popularity in the 1960s and 1970s, thanks to French obstetrician Frederick Leboyer. He championed the idea of gentler, more natural childbirth experiences. Leboyer's efforts, which aimed to create a soothing environment for the baby, played a significant role in the evolution of water birth techniques.

Water birth has gained recognition and popularity as a method of childbirth for those looking for a more natural and less medicalized experience. Water birth can take place in a hospital or birthing centre that has the necessary specialized facilities.

Many women discover that being in water can help ease muscle tension, alleviate pain, and create a soothing atmosphere. Many women, with the support of trained obstetricians, opt to give birth in a comfortable setting, allowing them to control the atmosphere.

Water can offer natural pain relief by promoting relaxation and reducing physical tension during contractions, and many mothers share that they have a more positive and peaceful birth experience.

Yet, not all hospitals or birth centres have the facilities for water births, and some medical conditions may make water labour and birth unsuitable. Moreover, there are concerns regarding waterborne infections for both the mother and baby, but the risk is usually low when proper hygiene and equipment are maintained. If complications occur, it might be more difficult to quickly assist the mother out of the water.

**Trial of Labour After Caesarean (TOLAC) or Vaginal Birth After Caesarean (VBAC)**

Trial of Labour After Caesarean (TOLAC) and Vaginal Birth After Caesarean (VBAC) refer to the attempts to have a vaginal delivery after a previous caesarean section. Although they are closely related, they represent different stages in the process, and there are key differences between the two. TOLAC refers to the process of attempting a vaginal delivery in a woman who has previously undergone a C-section. It is termed a "trial" because the results are unpredictable; if any complications occur, the labour may need to be changed to

a caesarean delivery. VBAC occurs when a woman successfully gives birth vaginally after having had a previous caesarean section.

The main distinction is that VBAC indicates a successful vaginal birth following a caesarean section, whereas TOLAC refers to the attempt to achieve that outcome. Choosing to pursue TOLAC or VBAC is one of the most important decisions an expectant mother faces after having previously delivered via caesarean section. For many women, the choice of a TOLAC offers a chance to have a vaginal delivery and steer clear of another caesarean section, which can pose greater risks for both the mother and the baby.

However, TOLAC does come with its own set of risks, and healthcare providers need to thoroughly evaluate each woman's circumstances before suggesting it. Labour may not go as expected, and a significant concern during TOLAC is the risk of uterine rupture.
This is a rare but serious complication where the scar from a previous C-section could tear during labour and it is more likely if the previous C-section involved a vertical incision.

The success of TOLAC relies on various factors, such as the type of incision made during the previous C-section, the reason behind the initial C-section, the mother's health, and the position of the baby. In a TOLAC, if labour is not progressing properly or if complications occur, it may be necessary to convert the labour to a caesarean delivery once again.

VBAC is the positive outcome especially if their previous caesarean was performed for a non-recurring reason, such as breech presentation or foetal distress.

The possibility of a successful VBAC depends on several factors, including the woman's overall health, the reason for her prior C-section, the number of previous C-sections she has had, and whether her current pregnancy is considered low-risk.

The labour process is closely monitored, and medical personnel need to be prepared to carry out a caesarean section promptly if any issues come up. If complications arise, like stalled labour or irregular foetal heart rates, a C-section might be necessary.

While VBAC offers advantages such as quicker recovery and the chance to avoid surgery, it also carries certain risks, mainly uterine rupture and haemorrhage. Nevertheless, the likelihood of uterine rupture in women pursuing VBAC is relatively low, estimated to be between 0.5% and 1%. The success rate for TOLAC can vary, generally ranging from 60% to 80%.

This depends on several factors, including the reason for the previous C-section, the woman's overall health, and how labour progresses. Women who have had a prior vaginal birth or a C-section due to a non-recurring issue (such as breech presentation or foetal distress) typically experience higher VBAC success rates.

The psychological impact on women should also be considered. Those who pursue TOLAC may go through a range of emotions during labour, given the uncertainty of the outcome.

The worry about a possible emergency C-section or uterine rupture can lead to anxiety, but many women find strength in the chance to pursue a vaginal birth after having a previous caesarean.

Those who successfully achieve a VBAC frequently express feelings of accomplishment, satisfaction, and empowerment. Many women feel a sense of relief at having avoided another C-section, valuing the quicker recovery and the opportunity for immediate bonding with their baby that often comes with vaginal birth.

**Breech Delivery**

Breech delivery is a childbirth situation where the baby is positioned in the uterus with its buttocks or feet facing downward instead of the head. In typical pregnancies, the baby usually assumes a head-down position, known as cephalic presentation, by the time labour begins, which makes vaginal delivery easier.

The approach to managing a breech pregnancy varies based on the type of breech presentation, the gestational age, and the health status of both the mother and the baby. However, in approximately 3-4% of full-term pregnancies, babies are positioned in breech position, leading to specific challenges and risks for both the mother and the infant.

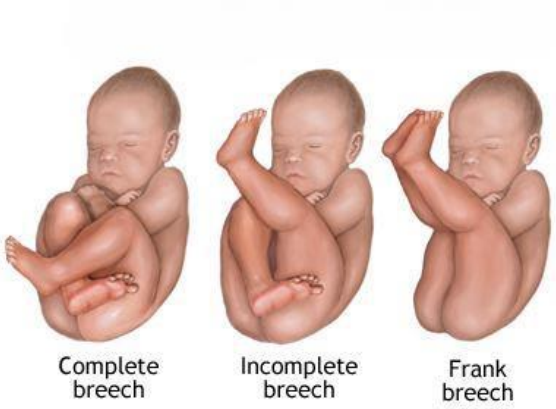
Breech presentation can be categorized into various types, each carrying distinct implications for delivery. The primary types of breech presentations include:

- Frank Breech**:** In the most typical type of breech presentation, the baby's legs are bent at the hips and stretched towards the head, with the feet positioned close to the head. The buttocks are the part that presents first, and the baby's legs are generally positioned near its face. This type of presentation is seen as the most advantageous

for vaginal breech delivery since the baby's body is compact, making it more likely to navigate through the birth canal.

- Complete Breech: In a complete breech presentation, the baby’s legs are bent at both the hips and knees, with the feet positioned close to the buttocks. Essentially, the baby is sitting cross-legged in the uterus. This type of presentation poses more challenges for vaginal delivery because it can be difficult to deliver the baby’s body and legs after the buttocks have been born.
- Incomplete Breech: In a footling breech, one or both of the baby's feet are positioned to come out first instead of the buttocks. This type of presentation can be especially risky, as the baby's head remains high in the birth canal when the body begins to emerge. Footling breech presentations are typically regarded as the most complex and are usually handled with a caesarean section.

Breech presentations can raise the likelihood of complications during labour and delivery for both the baby and the mother. These risks mainly stem from the challenges associated with delivering the baby's body after the buttocks or feet have already moved through the birth canal.




*Picture 8 Breech presentation. Source: Medlines Plus Types of breech presentation.*

The biggest risk associated with a breech delivery is head entrapment, which occurs when the baby's head is stuck in the birth canal after the body has been delivered. This situation is critical because the baby's head is the largest part of its body, making it challenging to deliver once the rest of the body has emerged. This can result in hypoxia and potential brain injury.

In addition, during a breech delivery, the umbilical cord can sometimes slip ahead of the baby's body, which may cut off the baby's blood supply and result in foetal distress. Due to the challenges of manoeuvring a baby during a breech birth, there is an increased risk of the baby experiencing a lower oxygen supply during delivery. This can lead to potential brain injury or even death if not properly managed. Similarly, there are several risks for the mothers. For instance, the risk of tearing or injury to the perineum increases during breech deliveries, especially when forceps or other interventions are employed.

Moreover, difficulties of delivering a baby in a breech position can result in a longer labour and a higher risk of bleeding after delivery, known as postpartum haemorrhage. In a similar manner, injuries to the cervix and uterus can also occur: the force needed to deliver a breech baby may heighten the risk of uterine rupture or cervical lacerations, particularly when other interventions are employed.

It is crucial for women with breech pregnancies to receive comprehensive counselling regarding the risks and benefits associated with each delivery option. Decisions about managing a breech pregnancy should be made together by the mother and her healthcare provider. This process should consider the unique circumstances of the pregnancy, the expertise of the obstetricians involved, and the preferences of the mother.

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| Partoanalgesia epidurale | Tipologia di intervento analgesico che determina in pochi minuti la riduzione del dolore lasciando inalterate tutte le altre sensibilità, compresa quella delle contrazioni uterine che continuano ad essere percepite, ma in modo non doloroso. | "La ***partoanalgesia epidurale*** è una modalità di somministrazione di farmaci analgesici ed anestetici che agiscono esclusivamente sulle vie di trasmissione del dolore e non sulle vie di trasmissione della sensibilità o sulle fibre motorie: in questo modo le contrazioni uterine vengono percepite, ma non sono dolorose." | Epidural Analgesia | Fondazione Veronesi, Magazine: https://www.fondazioneveronesi.it/magazine/articoli/ginecologia/analgesia-epidurale-tutto-quello-che-ce-da-sapere<br><br>Baylor College of Medicine: https://www.bcm.edu/healthcare/specialties/anesthesia/epidural-analgesia#:~:text=What%20Is%20Epidural%20Analgesia%3F,a%20local%20anesthetic%20and%20opioids. |

It is also called 'epidural', while in Italian it is also referred to as *peridurale* or *parto indolore con epidurale*.

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| Parto cesareo | Intervento chirurgico attraverso il quale uno o più feti, la placenta e le membrane amnio-coriali vengono estratti attraverso un'incisione della parete addominale e uterina. | "[…] La decisione di programmare il ***parto cesareo*** può essere sia di natura clinica, se esistono problemi o patologie, come quelli elencati precedentemente, che renderebbero il parto naturale rischioso sia per la madre che per il bambino, oppure da ricollegarsi a una scelta personale della donna." | Caesarean section | IRCCS, Università Cattolica del Sacro Cuore, Fondazione Policlinico Universitario Agostino Gemelli: https://privato.policlinicogemelli.it/approfondimenti/parto-cesareo/<br><br>Johns Hopkins Medicine: https://www.hopkinsmedicine.org/health/treatment-tests-and-therapies/cesarean-section |

It is abbreviated to 'C-section' and its etymology comes supposedly from Caius Julius Caesar, who was said to have been delivered surgically. Thus, also legend traces his *cognomen* to Latin *caesus*, past participle of *caedere* 'to cut'.

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| Parto distocico | Tipo di intervento ostetrico il cui espletamento è ostacolato e difficoltoso a causa del suo procedere fisiologico. | "[…] Al contrario di quanto avviene in un parto eutocico o naturale, nel ***parto distocico*** possono verificarsi situazioni pericolose per la mamma e il bambino. Queste possono essere prevedibili o a insorgenza tardiva nel corso del travaglio e richiedono interventi di tipo medico e ostetrico, manuali o strumentali." | Labour dystocia | Santagostino Magazine, Idee in salute: https://magazine.santagostino.it/parto-distocico-complicato/<br><br>AHRQ, Agency for Healthcare Research and Quality: https://effectivehealthcare.ahrq.gov/products/labor-dystocia/research-protocol |

It is also called 'obstructed labour.'

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| Parto eutocico | Tipo di parto nel quale non ci sono alterazioni, che inizia e si conclude in maniera spontanea e naturale, senza la necessità dell'intervento medico-chirurgico. | "[…] Dopo un parto cesareo, a livello dell'utero si forma una cicatrice che, in caso di parto ***eutocico successivo***, può aumentare lievemente il rischio di rottura dell'utero (1%) o una deiscenza proprio lungo la cicatrice, durante le contrazioni del travaglio di parto." | Spontaneous Vaginal Delivery (SVD) | Prof. Costantino Di Carlo, Professore di Ginecologia e Ostetricia, Università degli Studi di Napoli Federico II: https://www.costantinodicarlo.it/editoriali/parto-naturale-quali-sono-rischi-e-vantaggi-dopo-un-taglio-cesareo/<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/articles/9675-pregnancy-types-of-delivery |

In Italian, it is also known as *parto spontaneo*.

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| Parto indotto | Intervento ostetrico che induce un travaglio attivo e far nascere il bambino prima che si possano presentare complicanze dovute alla permanenza del feto nell'utero. | "[…] Si parla di ***parto indotto*** quando si ricorre ad alcune tecniche farmacologiche per far avviare il travaglio di parto, ossia per stimolare le modificazioni del collo uterino e le contrazioni necessarie a dare il via al travaglio." | UK: Induced labour<br><br>US: Induced labor | Dottor. Marco Zoccatelli, Studio Medico: http://www.ildottorzoccatelli.it/Parto/Induzione<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/treatments/17698-labor-induction |
| Parto in acqua | Tipologia di intervento ostetrico che riduce la pressione addominale grazie alla forza idrostatica consentendo contrazioni uterine di maggior efficacia e favorendo la circolazione sanguigna. | "[…] Il ***parto in acqua*** non è sempre possibile, ad esempio è controindicato in caso di parto gemellare, parto podalico, parto prematuro o altro." | Water birth | Servizio Sanitaria Regionale Emilia-Romagna, Azienda Unità Sanitaria Locale di Modena: https://www.ausl.mo.it/servizi-e-prestazioni/percorsi-di-cura-e-assistenza/percorso-nascita/il-parto/parto-in-acqua/<br><br>American Pregnancy Association: https://americanpregnancy.org/healthy-pregnancy/labor-and-birth/water-births/ |

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| Parto in casa | Tipologia di intervento ostetrico pianificato in casa con personale sanitario presente con formazione specifica. | "[…] Tale possibilità è invece offerta alle donne con gravidanza a basso rischio, ma è necessario che si affidino esclusivamente a personale accreditato per l'assistenza alla nascita e quindi alle sole Ostetriche/i che dovranno essere almeno due al momento del parto ed avere una pregressa formazione specifica per la rianimazione neonatale, come previsto dalla normativa vigente in materia, e una comprovata esperienza di assistenza al ***parto in casa***." | Home birth | Federazione Nazionale degli Ordini della Professione di Ostetrica: https://www.fnopo.it/notizie/comunicati-stampa/giornata-internazionale-del-parto-in-casa-vaccari-fnopo-garantire-alle-coppie-la-liberta-di-scelta-ma-assicurare-sicurezza-e-appropriatezza-delle-cure-per-donna-e-bambino<br><br>Mayo Clinic: https://www.mayoclinic.org/healthy-lifestyle/labor-and-delivery/in-depth/home-birth/art-20046878 |

In Italian, it is also known as *parto domiciliare*.

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| Parto operativo strumentale | Tipologia di intervento espletato con l'ausilio di forcipe o ventosa. | "[…] Le più recenti linee guida raccomandano al personale sanitario che assiste la donna in buona salute durante il travaglio fisiologico di non proporla più, nemmeno alle pazienti che hanno precedentemente avuto traumi perineali severi, poiché non soggette a rischio maggiore di trauma rispetto alle altre partorienti, e ne prescrivono l'utilizzo su valutazione medica solo in casi specifici di sospetta compromissione della salute del feto o di ***parto operativo strumentale***, per ritardo nel secondo stadio del travaglio." | Instrumental birth | Dott.ssa Chiara Riviello, Ginecologia e Ostetricia – Medicina Legale: https://www.chiarariviello.it/episiotomia-e-traumi-perineali-in-travaglio-da-pratica-di-routine-a-intervento-selettivo/<br><br>NHS, Nottingham University Hospitals: https://www.nuh.nhs.uk/instrumental-birth/ |

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| Parto podalico | Tipo di parto che si verifica quando il nascituro si presenta, a termine della gestazione, non in posizione cefalica. Dunque, il capo è in alto, mentre il sedere o i piedi sono in basso, pronti per incanalarsi nel canale del parto. | "[…] Si può decidere di procedere con un ***parto podalico*** naturale, se si constata che non c'è in sofferenza fetale e la morfologia di madre e bambino lo consentono." | Breech birth | Chiarini Studio Legale: https://www.chiarini.com/parto-podalico-rischi/<br><br>Royal College of Obstetricians & Gynecologists: https://www.rcog.org.uk/for-the-public/browse-our-patient-information/breech-baby-at-the-end-of-pregnancy/#:~:text=If%20your%20baby%20remains%20breech%20towards%20the%20end%20of%20pregnancy,you%20than%20a%20vaginal%20birth |
| Parto vaginale dopo un cesareo, (VBAC) | Tipologia di parto dove vengono valutate le caratteristiche della donna e della gravidanza per definire la possibilità di portare avanti un travaglio di parto, escludendo le dopo essere stati sottoposti al cesareo in un precedente gravidanza. | "[…] I vantaggi di un ***parto vaginale dopo un taglio cesareo***: avere un parto vaginale e non essere sottoposta a procedure chirurgiche, con relative complicanze, maggiori possibilità di avere un parto senza complicazioni in caso di futura gravidanza e minor dolore addominale dopo il parto." | UK: Vaginal Birth After Caesarean, (VBAC)<br><br>US: Vaginal Birth After Cesarean, (VBAC) | Servizio Sanitario Regionale Emilia-Romagna, Azienda Unità Sanitaria Locale di Modena: https://www.ausl.mo.it/servizi-e-prestazioni/percorsi-di-cura-e-assistenza/percorso-nascita/il-parto/parto-vaginale-dopo-cesareo/<br><br>Mayo Clinic: https://www.mayoclinic.org/healthy-lifestyle/labor-and-delivery/in-depth/vbac/art-20044869 |

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| Tentato travaglio dopo parto cesareo, (TOLAC) | Tipo di travaglio di una donna che è stata precedentemente sottoposta a taglio cesareo e che desidera partorire per via vaginale. | "[…] In letteratura vi è consenso, sostenuto da revisioni Sistematiche, e da linee guida cliniche che pianificare un ***TOLAC*** è un modo sicuro e appropriato di parto per la maggior parte delle donne con un singolo taglio cesareo pregresso sul segmento uterino inferiore, con o senza un parto vaginale in anamnesi." | Trial of labor after cesarean, (TOLAC) | Fondazione Confalonieri Ragonese su mandato di SIGO, AOGOI, AGUI: https://www.sigo.it/wp-content/uploads/2021/11/16-Raccomandazioni-Precesarizzate.pdf<br><br>UChicago Medicine: https://www.uchicagomedicine.org/conditions-services/pregnancy-childbirth/labor-delivery/tolac-vbac |

# Fasi del travaglio

# Stages of labour

## The Stages of Labour

Labour is a natural and transformative process, consisting of three stages: early labour, active labour, and the delivery of the placenta. It is a multifaceted and transformative process that readies the body for childbirth. Labour consists of a series of physiological events that lead to the delivery of a baby. This process is divided into three main and distinct stages: the first stage, the second stage, and the third stage. Each stage has unique characteristics and is essential to the overall experience of childbirth.[42]

## The First Stage: Early Labour and Active Labour

The first stage of labour is the longest phase and is divided into two parts: early labour and active labour.

- **Early Labour**: This phase marks the start of the birth process. Contractions become more regular, and the cervix starts to dilate to about 3-4 centimetres. For many women, early labour means irregular contractions that gradually increase in both frequency and intensity. It can last for several hours or even days, and typically, it is not as painful as the later stages. Many women choose to remain at home during the initial phase of labour, focusing on rest, hydration, and mental preparation for the more intense stages to come. Some women may observe the expulsion of the mucus plug from the cervix, or they might notice that their water has broken.

[42] Stages of labor and birth: Baby, it's time! (Last consultation 29 May 2025): https://www.mayoclinic.org/healthy-lifestyle/labor-and-delivery/in-depth/stages-of-labor/art-20046545

- **Active Labour**: Once the cervix has opened to about 4 centimetres, active labour starts. This phase is more intense and marks the progression of the first stage. Contractions become longer, stronger and occur more frequently. The cervix continues to dilate more quickly during this time, reaching around 7 centimetres by the end. Pain management options, including epidurals, intravenous medications, or natural techniques like breathing exercises and water immersion, can be explored and used at this stage. During active labour, the emphasis is typically on assisting the woman in managing her contractions and ensuring she remains as comfortable as possible while getting ready for the next phase of labour.

**Uterine Contractions**

Uterine contractions are essential during labour, significantly contributing to the delivery of a baby. These contractions happen when the uterine muscles tighten and then relax in a rhythmic manner, aiding in the dilation of the cervix and pushing the baby down the birth canal.[43] Initially, they are usually mild and spaced out, but as labour advances, they intensify, last longer, and occur more frequently.

During early labour, contractions play a crucial role in softening the cervix, allowing it to efface and dilatate gradually in preparation for delivery. As labour continues, these contractions become stronger and more frequent, helping to push the baby downward.

[43] Speller, J. (2024). Labour - Initiation of Labour - The Stages of Labour. TeachMePhysiology (last consultation 25 May 2025): https://teachmephysiology.com/reproductive-system/pregnancy/labour/

Many women find the intensity of the contractions to be the most painful aspect, but they are vital for guiding the baby through the birthing process.

While uterine contractions can be quite uncomfortable, they are a natural and essential aspect of childbirth. Many women find that using pain relief methods like epidurals, medication, or breathing techniques can help alleviate some of the discomfort. In the end, contractions play a crucial role in the process of bringing new life into the world.

**Pain relief with the Epidural Procedure**

An epidural is a widely used and effective method for pain relief during childbirth. This procedure involves injecting an anaesthetic or analgesic medication into the epidural space in the spine, which numbs the lower half of the body and greatly reduces or even eliminates pain during labour and delivery. While it helps ease the intense pain of contractions and the pressure felt during delivery, there are crucial factors and possible risks that every expectant mother needs to be aware of.[44]

The epidural procedure is usually carried out during the active phase of labour, once the cervix has dilated sufficiently for the epidural catheter to be inserted. The woman is either sitting up or lying on her side to create more space between the vertebrae in her lower back. To minimize discomfort during the needle insertion, healthcare professionals apply a local anaesthetic to the skin.

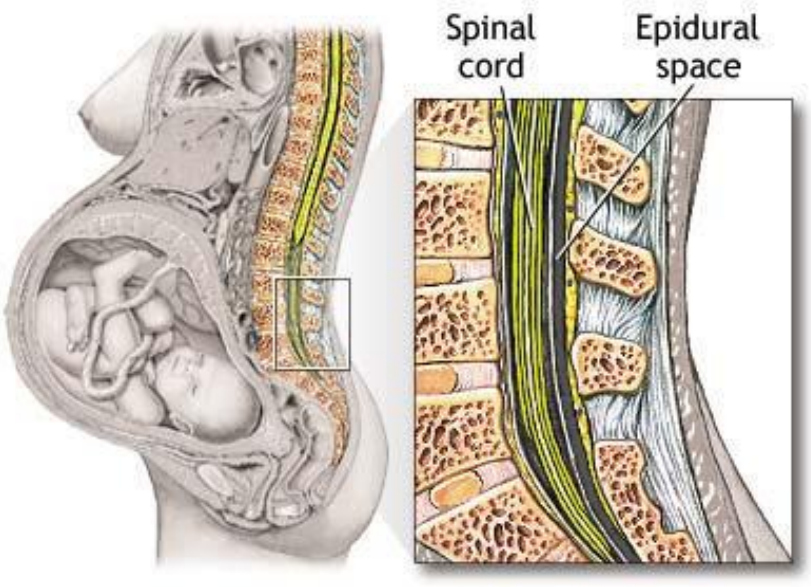
[44] Thorp JA, Breedlove G. *Epidural analgesia in labor: an evaluation of risks and benefits*. Birth. 1996 Jun;23(2):63-83. doi: 10.1111/j.1523-536x.1996.tb00833.x. PMID: 8826170.

The needle is inserted cautiously into the epidural space, which is just outside the protective covering of the spinal cord. Once the needle is properly positioned, a small catheter is inserted through it to enable a steady flow of medication.

This catheter remains in place during labour and is removed by obstetricians after the baby is delivered.

The main advantage of an epidural is its effectiveness in providing substantial pain relief. Many women find the pain from contractions and the pressure of pushing to be quite intense, and an epidural helps to alleviate that discomfort.

The medication allows the mother to remain awake and aware, enabling her to push effectively while significantly reducing pain levels. This can create a more calm and manageable experience during labour.




*Picture 9 Epidural procedure. Source: Mount Sinai, Spinal and epidural anesthesia.*

While epidurals are usually regarded as safe, they do carry some potential risks and side effects. Some women might experience a drop in blood pressure, which can impact the baby's heart rate and may need medical attention. Other possible side effects include headaches, fever, or issues with bladder control. Epidurals can also extend the second stage of labor because the numbing effect might lessen the mother's ability to sense the urge to push effectively.

**The Second Stage of Labour: Pushing and Delivery**

The second stage of labour starts when the cervix has completely dilated to 10 centimetres. At this moment, the mother often experiences a powerful urge to push as the baby moves down the birth canal. This stage is commonly known as the "pushing" stage and can last anywhere from 30 minutes to several hours, influenced by factors like the mother's childbirth experience, the baby's position, and whether it’s the mother’s first delivery. During this stage, contractions may become less frequent but more intense as the baby descends through the birth canal. The mother is often encouraged to push with each contraction, engaging her abdominal muscles to assist in moving the baby downward.

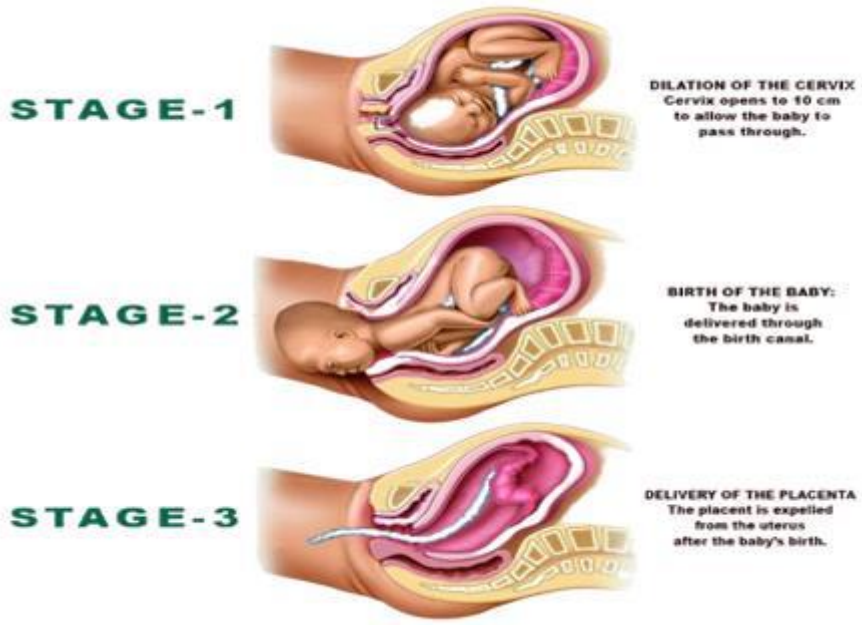
For some women, this stage can offer a sense of control, as they take an active role in bringing their child into the world. Nevertheless, it can also be quite physically exhausting. As the baby's head begins to crown (becoming visible at the vaginal opening), the mother might feel a strong sensation of stretching. When the baby's head crowns, the most intense phase of pushing starts, culminating in the final push that brings the baby into the world. Once the baby is delivered, the umbilical cord is cut, and the baby is usually placed on the mother's chest for immediate bonding and skin-to-skin contact.

The second stage of labour is a vital and empowering aspect of childbirth, signifying the moment the baby finally arrives.

**The Third Stage of Labour: Delivery of the Placenta**

The third and final stage of labour is when the woman delivers the placenta, which is the organ that supplied nourishment and oxygen to the baby throughout the pregnancy.[45] This stage begins immediately after the baby is born and lasts anywhere from 5 to 30 minutes. After that, contractions may still occur, but they are generally less intense. These contractions assist in detaching the placenta from the uterine wall. The mother may be guided to push again, which helps in the delivery of the placenta from the uterus. Then, obstetricians will examine it to ensure that it was completely expelled and that no remnants are left inside the uterus. In some cases, a woman might face complications during the third stage of labour, like retained placenta or heavy bleeding. When this happens, medical interventions may be necessary to protect the mother's safety and health.

[45] 1. Simpson KJ, Deering S, Deering S. *Management of the Second Stage of Labor. In: A Practical Manual to Labor and Delivery*. Cambridge University Press; 2018:77-86.




*Picture 10  Three stages of labour. Source: Dr Ganpenang, 3 stages of labour.*

Every stage is crucial for ensuring a safe and healthy delivery of a baby. Although the journey can be tough and demanding, it is also incredibly fulfilling and empowering. With the right prenatal care, education and support, women can face childbirth with confidence, understanding the stages of labour and the essential role of their bodies in welcoming a new life into the world. As can be seen, the stages of labour are influenced by many factors, but the primary goal is consistent: to achieve a safe and successful birth. The aim of each stage is to guarantee a safe and healthy delivery for both the mother and the baby, representing the peak of a transformative journey that leads to the joyful arrival of a new life. In conclusion, the stages of labor reflect the natural process of childbirth, and each stage is crucial in the path that leads to the birth of a baby. Every birth experience is different, but understanding the stages of labor can help set realistic expectations and guide choices regarding pain relief and medical interventions.

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| Contrazione uterina | Forza motrice che permette la dilatazione del collo uterino e la progressione del feto nel canale pelvi genitale. | “Il travaglio consiste in una serie di ***contrazioni uterine*** ritmiche, involontarie o indotte medicamente che si traducono nell'appianamento e nella dilatazione del collo dell'utero.” | Uterine contraction | Manuale MSD, Versione per professionisti: https://www.msdmanuals.com/it/professionale/ginecologia-e-ostetricia/travaglio-e-parto/gestione-del-travaglio-fisiologico<br><br>AJOG, American Journal Obstetrics and Gynecology, H. Rosen, Y. Yogev, 2023, *Assessment of uterine contractions in labor and delivery*: https://www.ajog.org/article/S0002-9378(22)00724-4/fulltext |

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| Fase espulsiva | Momento del parto in cui la partoriente asseconda i premiti e spinge, fino all'espulsione del feto. | "[…] Imparare a dominare il respiro è fondamentale per non farsi prendere dal panico e reagire alle contrazioni riprendendo il controllo del proprio corpo. In particolare, controllare l'espirazione, prolungandola per modulare la fuoriuscita dell'aria, è prezioso per la ***fase espulsiva***." | Second stage of labour | Servizio Sanitaria Regionale Emilia-Romagna, Azienda Unità Sanitaria Locale di Modena: https://www.ausl.mo.it/servizi-e-prestazioni/percorsi-di-cura-e-assistenza/percorso-nascita/il-parto/controllo-del-dolore-in-travaglio/metodiche-non-farmacologiche/<br><br>SNEE Wellbeing Support Service, Suffolk and North East Essex Maternity and Neonatal Services: https://maternity.sneewellbeing.org.uk/your-birth/the-second-stage-of-labour/ |

It is also called 'pushing stage' informally. In Italian, it is also reffered to as *secondo stadio*.

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| Fase dilatante | Momento che segna l'inizio vero e proprio del travaglio, quando il collo uterino raggiunge circa i 4 centimetri di dilatazione, le contrazioni diventano più ravvicinate, regolari e dolorose. | "[…] Tra la ***fase dilatante*** e la fase espulsiva, solitamente vi è una fase di transizione, o latenza, che può durare da mezz'ora fino a un'ora." | Dilation phase | IRCCS, Università Cattolica del Sacro Cuore, Fondazione Policlinico Universitario Agostino Gemelli: https://privato.policlinicogemelli.it/approfondimenti/parto-naturale/#:~:text=Tra%20la%20fase%20dilatante%20e,nonostante%20il%20travaglio%20stia%20procedendo.<br><br>Mayo Clinic: https://www.mayoclinic.org/healthy-lifestyle/labor-and-delivery/in-depth/stages-of-labor/art-20046545 |

In Italian, it is also known as *primo stadio*.

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| Perdita del tappo mucoso | Momento che sancisce un mutamento del collo dell'utero. Spesso è dovuto a variazioni ormonali che si concretizzano alla fine della gravidanza. | "[…] Quando la gravidanza si avvia verso la conclusione può essere, ma non è detto che succeda, che avvenga la ***perdita del tappo mucoso***." | Loss of mucus plug | Matteo Silva, Osteopata Pediatrico: https://www.matteosilvaosteopata.com/tappo-mucoso-in-gravidanza/#:~:text=Non%20si%20tratta%2C%20infatti%2C%20di,punto%20di%20vista%20dell'inclinazione<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/symptoms/21606-mucus-plug |

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| Periodo prodromico | Insieme di segni e sintomi che precede l'inizio del travaglio. | "[…] Il ***periodo prodromico*** è il momento in cui le contrazioni vengono percepite in modo incoordinato e come sensazione fastidiosa a livello lombo-sacrale." | Prodromal stage | AOR, Azienda Ospedaliera Regionale, Ospedale San Carlo: https://www.ospedalesancarlo.it/vicinidallanascita/il_travaglio<br><br>Somerset NHS Foundation Trust: https://www.somersetft.nhs.uk/early-intervention-in-psychosis/what-is-psychosis/prodrome/ |

In Italian, it is also reffered to as *prodromi di travaglio*.

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| Secondamento | Ultima fase del parto dove avviene l'espulsione della placenta, delle membrane e del cordone ombelicale. | "[…] Il ***secondamento*** avviene in maniera naturale entro circa mezz'ora dalla fine della fase espulsiva; in caso, dopo un'ora, la placenta non sia ancora stata espulsa si procede all'estrazione chirurgica sotto anestesia." | Third stage | IRCCS, Università Cattolica del Sacro Cuore, Fondazione Policlinico Universitario Agostino Gemelli: https://privato.policlinicogemelli.it/approfondimenti/parto-naturale/<br><br>NCT, National Childbirth Trust: https://www.nct.org.uk/information/labour-birth/what-happens-labour-birth/third-stage-labour-delivering-placenta-and-cord-clamping#:~:text=The%20third%20stage%20of%20labour%20is%20the%20time%20between%20when,the%20placenta%20start%20to%20separate |

It is also known as 'placental stage'. In Italian, it is referred to as *terzo stadio*.

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| Travaglio post-termine | Travaglio che avviene in un periodo di tempo pari o superiore a 42 settimane. | "[…] Ci si propone di valutare le possibili correlazioni tra variabili demografiche ed ecografiche e probabilità di successo dell'induzione del ***travaglio post-termine***, con lo scopo di ottenere una previsione precoce della necessità di taglio cesareo." | Post-term labour | Università di Verona, Dipartimento di Scienza Chirurgiche Odontostomatologiche e Materno-infantili: https://www.dscomi.univr.it/?ent=progetto&id=1295<br><br>JCOG, Journal of Obstetrics & Gynecology, M. Hanifi, B. Cihan, S. Egea, N Pekerb,S. C. Oğlak, *Factors Affecting Successful Vaginal Birth Following Dinoprostone Administration in Post-term Pregnancies*: https://www.jcog.com.tr/article/en-factors-affecting-successful-vaginal-birth-following-dinoprostone-administration-in-post-term-pregnancies-90703.html |

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| Travaglio pretermine | Travaglio che avviene in un periodo di tempo inferiore alle 37 settimane. | "[…] Il ***travaglio pretermine*** può aumentare il rischio di emorragia intraventricolare nei neonati; l'emorragia intraventricolare può causare disabilità di sviluppo neuronale." | Preterm labor | Manuale MSD, Versione per i professionisti: https://www.msdmanuals.com/it/professionale/ginecologia-e-ostetricia/complicanze-prenatali/travaglio-pretermine<br><br>Mayo Clinic: https://www.mayoclinic.org/diseases-conditions/preterm-labor/symptoms-causes/syc-20376842 |

# Complicanze e malattie

# Complications and diseases

**Complications and Diseases in the advancements of the medical field related to childbirth and women's health**

The medical field has made incredible strides over the last century, especially in the areas of childbirth and women's health. These developments have greatly enhanced outcomes for mothers and new-borns, lowered risks, and offered improved treatment options for women's health concerns. Thanks to these advancements, conditions that once posed severe threats to life can now be managed effectively, reflecting a broader shift toward preventive care and evidence-based medicine.

Prenatal care has transformed significantly over the past century. In the past, many pregnancies were managed with little medical oversight, which often resulted in high rates of maternal and infant mortality. Nowadays, routine prenatal care includes regular check-ups to monitor the health of both the mother and the foetus, leading to much better outcomes. This systematic approach allows healthcare professionals to detect early warning signs and intervene before complications escalate.

In addition to traditional approaches, digital technology is further transforming prenatal care. Wearable devices, mobile applications, and telemedicine platforms now enable continuous remote monitoring of vital signs for both the mother and the foetus. This is particularly valuable in rural areas or low-resource settings where access to healthcare facilities may be limited. Telemedicine allows for virtual consultations with specialists, reducing disparities in access to care and facilitating earlier diagnosis. Moreover, real-time data collection supports the creation of personalized treatment plans, further improving clinical outcomes.

One of the most significant advancements in prenatal care is the introduction of ultrasound imaging.[46] Since its first use in the 1950s, ultrasound has become essential for prenatal diagnosis. It enables early detection of foetal abnormalities, helps determine gestational age, monitors foetal growth, and identifies multiple pregnancies, such as twins or triplets.

[46] Donald, I., MacVicar, J., & Brown, T. G. (1958). *Investigation of abdominal masses by pulsed ultrasound*. The Lancet, 272(7053), 1188–1195.

Additionally, it allows visualization of the placenta, amniotic fluid, and the foetus's position, assisting doctors in spotting potential complications like placenta accreta or breech births at an early stage.

Modern prenatal care places a strong emphasis on monitoring the health of expectant mothers. Advances in screening methods for conditions like gestational diabetes, preeclampsia and infections have improved the ability to identify and manage issues that were previously challenging to detect. For instance, the standard practice of screening for gestational diabetes through a glucose tolerance test has greatly lowered the risks linked to uncontrolled blood sugar levels during pregnancy, including preterm birth and the delivery of excessively large babies.

Furthermore, childbirth was something extremely complex and the mortality rate was often high due to a lack of knowledge and technology. Childbirth has experienced significant changes, especially in areas like pain management, labour management, and the prevention of complications.

The introduction of epidural anaesthesia[47] in the mid-20$^{th}$ century marked a significant milestone in childbirth. Epidurals offer effective pain relief during labour, enabling women to experience less discomfort and gain more control over their birthing process, which was once overshadowed by the severe pain of contractions. Although epidurals come with certain risks, their widespread adoption has made labour more bearable for many women and has decreased the reliance on opioid-based medications. Additionally, other pain management options like nitrous oxide and natural childbirth techniques have provided women with more choices in how they experience childbirth. The availability of personalized birthing plans and support from doulas or midwives has further empowered women during the labor process.

A crucial yet often overlooked aspect of maternal health is mental well-being during and after pregnancy. Women may experience conditions such as perinatal depression, anxiety, and in severe cases, postpartum psychosis.

[47] Silva, M., & Halpern, S. H. (2010). *Epidural analgesia for labor: Current techniques. Local and Regional Anesthesia*, 3, 143–153.

In the past, these issues were widely neglected, but today, integrated care programs include standardized mental health screenings and targeted interventions such as therapy or pregnancy-safe medications. Increased awareness has helped reduce stigma and improve access to emotional support, contributing significantly to the overall health of both mother and child.

Overall, the field of reproductive health has undergone remarkable changes due to technological and medical advancements. Conditions that previously led to infertility or complicated pregnancies can now be effectively treated or managed, enabling women to enjoy improved reproductive health.

This evolution reflects not only scientific progress but also a growing recognition of women's rights to informed, respectful, and patient-centered care.

**Conditions and treatments**

Childbirth is a life-changing experience, yet it can also be intricate and occasionally perilous. Although many women have a straightforward pregnancy and delivery, complications can emerge unexpectedly, affecting both the mother and the baby. These issues can vary in severity, and if not addressed appropriately, some may lead to lasting effects.

Historically, childbirth was associated with a high maternal and infant mortality rate, especially before the advent of antiseptic techniques and modern obstetric interventions in the 19th and 20th centuries. The development of hospital-based deliveries, antisepsis, and trained birth attendants drastically reduced risks that were once considered inevitable. Understanding this evolution helps appreciate the life-saving potential of today’s practices and highlights the importance of continuous medical advancement.
It is essential to be aware of the potential health concerns and complications related to childbirth to safeguard the well-being of both mother and child. Early diagnosis and intervention play a critical role in preventing maternal and neonatal morbidity and mortality.

Recent advancements in understanding conditions such as Chorioamnionitis and Uterine Inversion (UI)[48] have resulted in improved treatment options for women dealing with chronic pain and infertility. Laparoscopic surgery provides a minimally invasive approach to removing endometrial tissue or fibroids, which enhances recovery time and lowers the risk of complications. Such treatment options enable women to preserve their quality of life and fertility while reducing the effects of these conditions. Laparoscopy is now considered the gold standard for many gynecologic surgeries, offering reduced postoperative pain and faster recovery.

Diagnosis is a key factor in safeguarding and protecting women's health. Recent advancements in the early detection and treatment of diseases that primarily affect female healthcare have significantly improved health outcomes for women.

From enhanced prenatal care and safer childbirth techniques to progress in fertility treatments and the management of women's health issues, modern medicine has achieved remarkable advancements. These developments continue to empower women by offering improved access to healthcare, lowering health risks, and boosting overall well-being. As research advances, we can anticipate even more breakthroughs that will further improve women's health and reproductive outcomes, enabling women to lead healthier, longer lives. Investment in reproductive research and the integration of digital health tools, such as telemedicine, also promise to expand access and personalization of care.

Despite remarkable progress, disparities in access to maternal healthcare persist globally. In low-income and rural areas, limited access to prenatal care, skilled birth attendants, and emergency obstetric services still contributes to high maternal and neonatal mortality rates. Social determinants such as education, economic status, and geographic location strongly influence outcomes, underscoring the need for equitable healthcare systems.

[48] Coccia, M. E., Nardone, L., & Rizzello, F. (2022). Endometriosis and infertility: A long-life approach to preserve reproductive integrity. *International Journal of Environmental Research and Public Health, 19*(10), 6162. This comprehensive review discusses the evolution of managing endometriosis-related infertility, emphasizing the importance of preserving reproductive integrity throughout a woman's life.

Various complications and conditions can affect a pregnant woman, such as preeclampsia.[49]

This serious condition is characterized by high blood pressure and can lead to potential damage to organs, especially the kidneys. It usually arises after the 20th week of gestation and can result in serious complications, including seizures, stroke, or organ failure if not properly managed. In severe cases, it may necessitate the early delivery of the baby to safeguard the mother's health.

Another condition that needs special attention is gestational diabetes, which is a type of diabetes that occurs during pregnancy, typically between the 24th and 28th weeks. It happens when the body is unable to produce enough insulin to manage blood sugar levels effectively. Although we may manage gestational diabetes with proper diet and exercise, it may lead to complications during delivery, such as the necessity for a caesarean section, increased birth weight (macrosomia), and a higher likelihood of preterm birth.

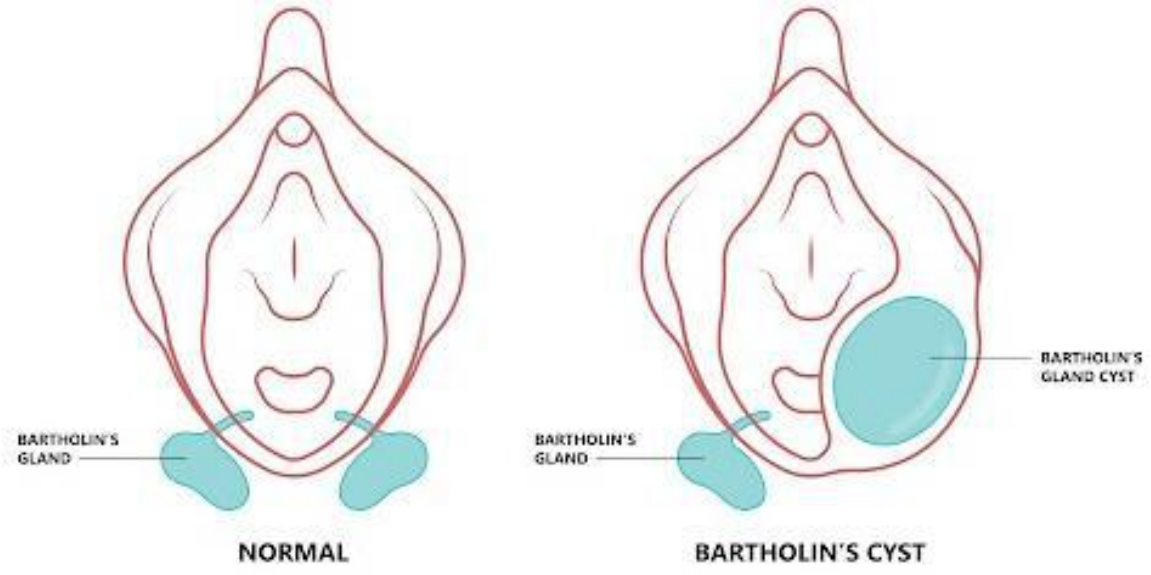
How well it is understandable, a variety of diseases can influence the reproductive system, varying in severity and potentially affecting both fertility and overall quality of life. One such condition is Bartholinitis, commonly referred to as Bartholin's gland infection, which is relatively common but often misunderstood. These glands are placed on either side of the vaginal opening and play a crucial role in secreting fluids that provide lubrication for the vagina. When the Bartholin's glands become infected or blocked, it can result in inflammation, pain, and sometimes the development of an abscess. The symptoms of Bartholinitis can vary from mild to severe.

[49] Preeclampsia is a hypertensive disorder of pregnancy that affects approximately 2–8% of pregnancies worldwide. It is a leading cause of maternal and fetal morbidity and mortality, contributing to over 50,000 maternal deaths annually. Abalos, E., Cuesta, C., Carroli, G., Qureshi, Z., Widmer, M., Vogel, J. P., & Souza, J. P. (2014). *Pre-eclampsia, eclampsia and adverse maternal and perinatal outcomes: A secondary analysis of the World Health Organization Multicountry Survey on Maternal and Newborn Health. BJOG*: *An International Journal of Obstetrics & Gynaecology*, 121(Suppl 1), 14–24.

In the initial stages, women might feel discomfort or notice swelling near the vaginal opening. If the infection worsens, a painful lump, known as an abscess, can develop, leading to considerable pain, particularly when walking, sitting, or engaging in sexual activity.

While the abscess may sometimes rupture and drain on its own, there are instances where medical treatment is necessary to drain the pus and alleviate pressure. Surgical interventions, such as marsupialization, may be required in recurrent cases to prevent future blockages.

We know that problems for future mothers are not only before and during pregnancy, but these can also happen after the birth. Indeed, we must emphasise that the women are not safe immediately after childbirth. Various problems can occur, such as the postpartum haemorrhage, which is one of the most common and potentially dangerous complications after childbirth. It can happen due to several reasons, when the uterus does not contract effectively after childbirth, tears in the birth canal, or retained placenta. If not addressed, it may result in shock, organ failure, or even death.




*Picture 11 Bartholinitis. Source: Pantai Medical Centre.*

In addition, to physical complications, the postpartum period can also affect mental health. Postpartum depression, anxiety, and even psychosis can significantly impact the well-being of the mother and her ability to care for her newborn.

These conditions often go undiagnosed or are stigmatized, yet early screening and access to psychological support are crucial for healthy maternal adjustment and bonding.

As if that were not enough, one must take a special look at possible infections and their consequences. For instance, postpartum pyelonephritis is an important yet frequently overlooked complication that can develop after childbirth. This condition, which involves an infection of the renal parenchyma, occurs when bacteria travel from the lower urinary tract to the kidneys, resulting in inflammation and infection.

While postpartum pyelonephritis[50] is relatively rare compared to other complications that can arise after giving birth, its potential severity and the risks it poses to both the mother and infant deserve careful consideration. It happens when bacteria, usually originating from the lower urinary tract, infect the kidneys. After childbirth, a woman's urinary tract may be more susceptible to these infections because of the anatomical and physiological changes that take place during pregnancy.

The risk of urinary tract infections (UTIs) can increase during pregnancy, and if these infections are not treated, they may develop into pyelonephritis. Treatment for postpartum pyelonephritis usually consists of antibiotic therapy aimed at eliminating the infection and avoiding complications.

[50] Lain, S. J., Roberts, C. L., Hadfield, R. M., & Walker, J. (2011). *Severe maternal morbidity of postpartum pyelonephritis: A population-based study. Paediatric and Perinatal Epidemiology*, 25(2), 182–188.
A study comparing maternal morbidity in postpartum and antepartum pyelonephritis found that while both groups had similar lengths of hospitalization, women diagnosed in the postpartum period were more likely to be febrile and had higher temperatures on presentation.

**Complications for the baby**

While childbirth is a natural and often joyful experience, it is crucial to recognize and address the potential complications that can occur for both the mother and the baby. Historically, childbirth was associated with high risks for both mother and baby, with complications often leading to serious outcomes. Thanks to advances in medicine, these risks have decreased significantly worldwide, though they remain a challenge in certain regions due to disparities in healthcare access. Improvements in prenatal care, labor management, and neonatal care have greatly lowered the risks linked to childbirth, but staying alert, making timely interventions, and having the right medical support are essential for achieving the best possible outcomes for both mother and child.[51]

Certain factors can raise the chances of complications during childbirth. These factors include the mother's age (whether very young or older), existing health issues (like diabetes, hypertension, or obesity), multiple pregnancies (such as twins or more), and insufficient prenatal care.

Nevertheless, we may manage many of these risks effectively through diligent prenatal monitoring and intervention. Regular prenatal check-ups often include ultrasounds, blood tests, and screening for infections, which help detect any potential issues early on. Lifestyle modifications, such as quitting smoking, reducing alcohol intake, and managing stress, further contribute to a healthy pregnancy. By recognizing the risks and maintaining consistent medical care throughout pregnancy, many complications can be prevented or effectively handled. Improvements in prenatal care, labour management, and neonatal care have greatly lowered the risks linked to childbirth, but staying alert, acting promptly, and having the right medical support are essential for achieving the best outcomes for both mother and baby.

[51] WHO, World Health Organization, Standards for improving quality of maternal and newborn care in health facilities. (Last Consultation: 02 June 2025): https://qualityhealthservices.who.int/quality-toolkit/qt-catalog-item/standards-for-improving-quality-of-maternal-and-newborn-care-in-health-facilities?_

Preventive measures involve regular prenatal check-ups to ensure the well-being of both the mother and the baby, making lifestyle adjustments like maintaining a balanced diet and staying active and seeking prompt medical care for issues such as gestational diabetes or preeclampsia.

Among the most feared complications for infants is the fetal hypoxia, a condition where the fetus does not receive enough oxygen is a significant concern in obstetrics because it can lead to serious complications for both the fetus and the mother. Fetal hypoxia triggers a cascade of cellular responses, including metabolic shifts from aerobic to anaerobic pathways, which can compromise organ development. Monitoring methods like fetal heart rate tracing and Doppler ultrasound of blood flow in the umbilical artery help in early detection. In severe cases, emergency delivery may be necessary to prevent irreversible damage.

Oxygen plays a vital role in normal fetal development by supporting cellular functions, metabolism, and the growth of essential organs, such as the brain. If the oxygen supply is reduced, the fetus may face various negative outcomes, ranging from minor developmental delays to serious, irreversible harm, including brain injury or even death.

Fetal hypoxia can be classified into two types: acute and chronic.

- **Acute hypoxia** happens suddenly, often due to an immediate event such as umbilical cord prolapse, placental abruption, or uterine rupture. If not addressed quickly, the rapid onset of hypoxia in these situations can lead to serious consequences.

- **Chronic hypoxia**, in contrast, develops gradually and is typically linked to more subtle, ongoing reductions in placental function. Conditions like intrauterine growth restriction (IUGR), preeclampsia, or maternal issues such as chronic hypertension can contribute to chronic fetal hypoxia.

For instance, acute hypoxia may occur during labor if the umbilical cord becomes compressed, cutting off oxygen supply suddenly.

Chronic hypoxia, however, might be suspected if fetal growth slows over several weeks, indicating persistent placental insufficiency.[52] Fetal hypoxia is a significant concern in obstetrics that demands quick diagnosis and action to prevent severe complications. Healthcare providers follow strict protocols to monitor fetal well-being, including biophysical profiles and non-stress tests.

When signs of hypoxia emerge, interventions may range from maternal oxygen therapy to planned cesarean section, depending on severity. By identifying risk factors, keeping an eye on fetal health, and taking action when needed, healthcare professionals can greatly enhance the outcomes for both the fetus and the mother.

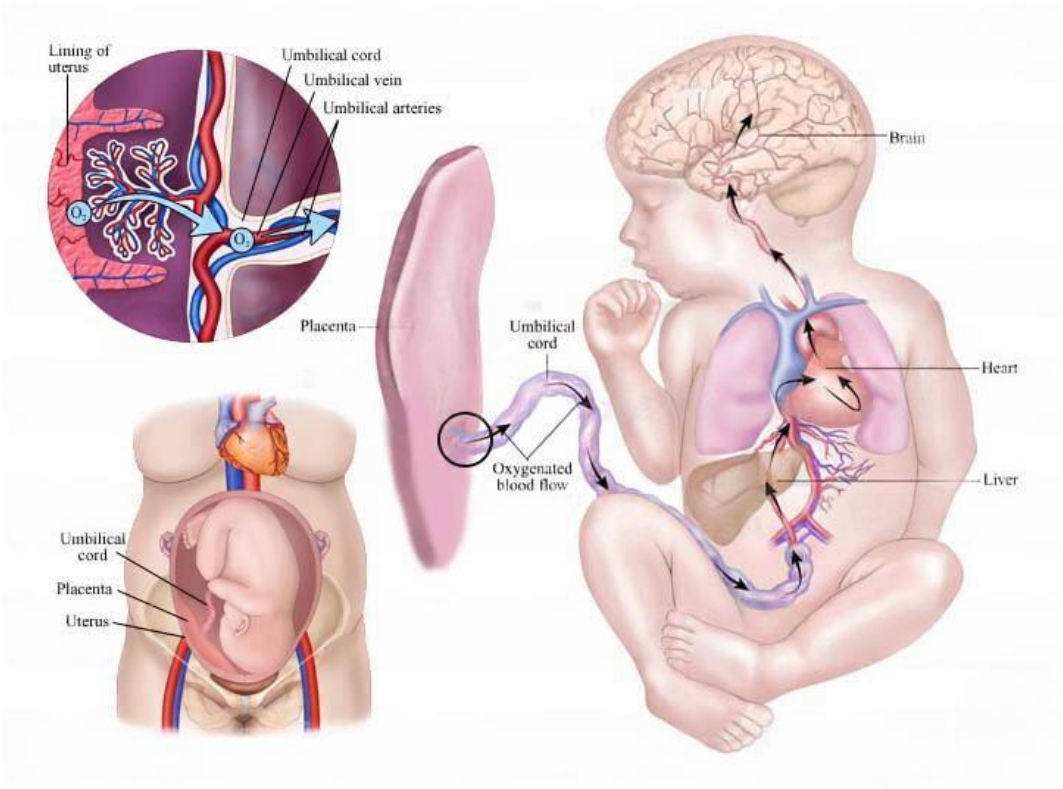
Although improvements in prenatal care and monitoring have made it easier to handle fetal hypoxia, ongoing attention and prompt intervention are still crucial for achieving the best possible perinatal results.

Childbirth complications can significantly impact maternal and neonatal health.[53] Common issues include hemorrhage, preeclampsia, and infections. Understanding risk factors, timely interventions, and effective management strategies is crucial for improving outcomes.

[52] Krishna U, Bhalerao S. *Placental insufficiency and fetal growth restriction*. J Obstet Gynaecol India. 2011 Oct;61(5):505-11. doi: 10.1007/s13224-011-0092-x. Epub 2011 Nov 17. PMID: 23024517; PMCID: PMC3257343.

[53] The World Health Organization (WHO) has identified hemorrhage and hypertensive disorders, such as preeclampsia, as leading causes of maternal deaths globally. In 2020, hemorrhage accounted for approximately 80,000 maternal deaths, while hypertensive disorders contributed to around 50,000 fatalities.

World Health Organization. (2025, March 8). *Many pregnancy-related complications going undetected and untreated. New research sheds light on major causes of maternal deaths* – WHO.




*Picture 12 Placenta and fetus with $O_2$ circulation. Source: Illustrated Verdiet.*

Thus, while childbirth complications are not something that happens every day, they continue to be a major concern for the health of mothers and newborns around the globe. Advances in medical technology, enhancements in prenatal care, and greater awareness have all played a role in lowering the risks linked to childbirth.

Complications like hemorrhage, preeclampsia, and fetal distress remain significant risks for both mothers and their babies, especially in areas with limited resources. As healthcare systems advance, it is crucial to focus not just on better medical treatments but also on improving education, access to care, and timely support for pregnant women. By tackling these issues, we can make progress in lowering maternal and neonatal mortality rates, ensuring that childbirth is a safe and healthy experience for all women. Holistic and equitable healthcare approaches will be key to ensuring that every birth is as safe as possible.

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| Amenorrea | Assenza di ciclo mestruale. Può essere primaria, se non è ancora comparso dopo i 16 anni, e secondaria, quando si interrompe in età avanzata. | "[…] Le donne con ***amenorrea*** da disfunzione ipotalamica hanno livelli più bassi di leptina sierica; livelli più bassi possono contribuire alla riduzione della produzione di gonadotropine." | Amenorrhea | Manuale MSD, Versione per professionisti: https://www.msdmanuals.com/it/professionale/ginecologia-e-ostetricia/anomalie-del-ciclo-mestruale/amenorrea<br><br>Mayo Clinic: https://www.mayoclinic.org/diseases-conditions/amenorrhea/symptoms-causes/syc-20369299#:~:text=Amenorrhea%20(uh%2Dmen%2Do,one%20or%20more%20menstrual%20periods |
| Bartolinite | Infiammazione causata da traumatismi della zona genitale o da infezioni batteriche che colpiscono le ghiandole di Bartolini. | "[…] Nei casi in cui la ***bartolinite*** non sia responsiva ai trattamenti farmacologici oppure se si dovesse ripresentare più volte nell'arco di un anno, può essere preso in considerazione il trattamento chirurgico." | Bartolinitis | IRCCS, Università Cattolica del Sacro Cuore, Fondazione Policlinico Universitario Agostino Gemelli: https://privato.policlinicogemelli.it/approfondimenti/bartolinite/<br><br>Mayo Clinic: https://www.mayoclinic.org/diseases-conditions/bartholin-cyst/symptoms-causes/syc-20369976 |

It is also called 'Bartholin's cyst'. In Italian, it is referred to as *cisti di Bartolini*.

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| Cisti del dotto di Skene | Formazioni cistiche vulvari che insorgono in seguito ad un'ostruzione dei dotti escretori, da cui deriva l'ingrossamento delle ghiandole. | "[…] Le ***cisti del dotto di Skene*** si formano se il dotto è ostruito, generalmente a causa di infezioni a carico delle ghiandole. Le infezioni generalmente si verificano nei soggetti adulti." | Skene's Gland Cyst | MSD, Versione per i professionisti: https://www.msdmanuals.com/it/professionale/ginecologia-e-ostetricia/disturbi-ginecologici-vari/cisti-del-dotto-di-skene<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/diseases/21892-skenes-gland-cyst |

In Italian, it is also known as *cisti delle ghiandole di Skene*.

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| Colestasi gravidica | Patologia epatica che può insorgere nelle fasi finali della gestazione. Si manifesta attraverso un forte prurito alle mani che è dovuto all'alterazione del normale flusso della bile e, in seguito, dall'aumento della concentrazione di acidi biliari nel sangue. | "[…] La ***colestasi gravidica*** sembra essere causata da un'ipersensibilità agli ormoni della gravidanza." | Obstetric Cholestasis, (OC) | Laboratorio Diego Angeli S.r.l: https://www.laboratoriodiegoangeli.it/news-medicali/colestasi-gravidica/<br><br>NHS, National Health System, Buckinghamshire Healthcare: https://www.buckshealthcare.nhs.uk/birthchoices/pifs/obstetric-cholestasis-liver-disorder-in-pregnancy/ |

In Italian, it is referred to as *colestasi ostetrica* or *colestasi intraepatica della gravidanza*.

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| Corioamnionite | Rottura delle membrane con infezione interna del corion, dell'amnio, del liquido amniotico, della placenta, della decidua o del feto, che aumenta il rischio di complicanze ostetriche con conseguente morte del feto e complicanze per la madre. | "[…] Lo studio Antila-Långsjö ha inoltre identificato infezioni che comprendevano ***corioamnionite***, endometrite e infezioni della ferita postpartum. I criteri diagnostici per la corioamnionite comprendevano la febbre intrapartum e l'aumento dei marcatori di infezione (come la proteina C-reattiva e la conta leucocitaria), accompagnati da tachicardia materna o fetale." | Chorioamnionitis | The International Society for Gynecologic Endoscopy: https://www.isge.org/it/2023/12/which-surgical-approach-is-the-best-for-patients-with-symptomatic-isthmocele-a-systematic-review-and-meta-analysis-for-laparoscopy-hysteroscopy-and-transvaginal-surgery/<br><br>Stanford Medicine, Children's Health: https://www.stanfordchildrens.org/en/topic/default?id=chorioamnionitis-90-P02441 |
| Depressione post partum | Disturbo reattivo unipolare che si manifesta dopo il parto soprattutto sul piano ormonale e psicoemotivo. | "[…] La ***depressione post partum*** può far sentire la neo mamma sopraffatta dalle responsabilità delle cure del bambino e dalle sue richieste." | Postpartum depression, (PPD) | Fondazione IRCCS Ca' Granda, Ospedale Maggiore Policlinico di Milano: https://www.policlinico.mi.it/mangiagalli-center/diventare-mamma/depressione-post-partum<br><br>Mayo Clinic: https://www.mayoclinic.org/diseases-conditions/postpartum-depression/symptoms-causes/syc-20376617 |

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| Diabete gestazionale | Forma di iperglicemia che si manifesta, nella maggior parte dei casi, durante il secondo trimestre di gravidanza. | "[…] Il ***diabete gestazionale*** si associa a un aumentato rischio di complicazioni in gravidanza e a un rischio metabolico a lungo termine sia nella madre sia nella progenie." | Gestational diabetes | Ospedale Pediatrico Bambino Gesù: https://www.ospedalebambinogesu.it/diabete-gestazionale-111885/#:~:text=Il%20diabete%20gestazionale%20%C3%A8%20la,nella%20madre%20sia%20nella%20progenie<br><br>Mayo Clinic: https://www.mayoclinic.org/diseases-conditions/gestational-diabetes/symptoms-causes/syc-20355339 |

It is also called Gestational Diabetes Mellitus (GDM).

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| Distocia di spalla | Emergenza ostetrica che si può presentare nel tentativo di parto vaginale, ovvero quando la testa fetale si disimpegna ma il parto non progredisce perché la spalla anteriore è bloccata dietro la sinfisi pubica o la spalla posteriore è bloccata dal promontorio sacrale. | "[…] La ***distocia delle spalle*** viene diagnosticata quando la testa fetale viene liberata, ma poi si ritrae contro il perineo materno e quindi la spalla anteriore non viene liberata nonostante la lieve trazione verso il basso sulla testa fetale." | Shoulder dystocia | Manuale MSD, Versione per professionisti: https://www.msdmanuals.com/it/professionale/ginecologia-e-ostetricia/complicanze-intrapartum/distocia-delle-spalle<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/diseases/22311-shoulder-dystocia |

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| Edema | Accumulo di liquido interstiziale negli spazi intercellulari che viene causato dall'aumento della permeabilità dei vasi capillari, della ritenzione di sodio oppure di un'insufficienza dei vasi linfatici. | "[…] L'***edema*** è frequente durante la gravidanza avanzata. Tipicamente coinvolge gli arti inferiori ma occasionalmente compare come tumefazione o gonfiore al volto o alle mani." | UK: Oedema<br><br>US: Edema | Manuale MSD, Versione per professionisti: https://www.msdmanuals.com/it/professionale/ginecologia-e-ostetricia/sintomatologia-durante-la-gravidanza/edema-degli-arti-inferiori-durante-la-fase-avanzata-della-gravidanza<br><br>Mayo Clinic: https://www.mayoclinic.org/diseases-conditions/edema/symptoms-causes/syc-20366493 |

This word originates from the Greek *οἴδημα* "swelling", derivation of *οἰδάω* "to be swollen".

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| Embolia di liquido amniotico | Sindrome clinica di ipossia, ipotensione e coagulopatia che risulta dall'entrata di antigeni fetali nella circolazione materna. | "[…] Poiché l'esposizione materna agli antigeni fetali è probabilmente abbastanza comune durante il travaglio e il parto, non è chiaro il motivo per cui solo alcune donne sviluppano ***embolia di liquido amniotico***." | Amniotic Fluid Embolism, (AFE) | Manuale MSD, Versione per i professionisti: https://www.msdmanuals.com/it/professionale/ginecologia-e-ostetricia/complicanze-intrapartum/embolia-di-liquido-amniotico<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/diseases/15463-amniotic-fluid-embolism |

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| Emorragia post-partum | Perdita ematica che avviene soprattutto per mancata emostasi nella sede d'inserzione placentare. | "[…] Ci sono vari strumenti di valutazione per aiutare gli operatori ostetrici e le strutture sanitarie a sviluppare modi per riconoscere e gestire rapidamente l'***emorragia post-partum***. Questi strumenti sono ampiamente disponibili e possono essere adattati alle esigenze della specifica popolazione di pazienti." | Postpartum Hemorrhage, (PPH) | Manuale MSD, Versione per i professionisti: https://www.msdmanuals.com/it/professionale/ginecologia-e-ostetricia/complicanze-intrapartum/emorragia-post-partum<br><br>WHO, World Health Organization: https://www.who.int/teams/sexual-and-reproductive-health-and-research-(srh)/areas-of-work/maternal-and-perinatal-health/postpartum-haemorrhage#:~:text=Severe%20bleeding%20after%20childbirth%20%2D%20postpartum,about%2070%2C000%20maternal%20deaths%20globally |

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| Ingorgo mammario | Ostruzione dei dotti galattofori che si manifesta dopo il parto attraverso pienezza e compattezza del seno, accompagnata da dolore e tensione cutanea. | "[…] L' accumulo di latte all'interno degli alveoli che accompagna l'***ingorgo mammario*** può causare non solo il loro riempimento, ma anche la loro rottura e la successiva fuoriuscita di latte nei tessuti mammari." | Breast engorgement | Ospedale Pediatrico Bambino Gesù: https://www.ospedalebambinogesu.it/ingorgo-mammario-126652/<br><br>NHS, National Health System: https://www.nhs.uk/conditions/baby/breastfeeding-and-bottle-feeding/breastfeeding-problems/breast-pain/ |
| Inversione uterina | Emergenza ostetrica che si manifesta col rovesciamento dell'utero verso l'esterno e protrude nella vagina o al di là dell'introito, il che può provocare emorragia, shock o morte materna. | "[…] L'***inversione uterina*** è un'emergenza, e i medici devono chiamare personale aggiuntivo esperto in emergenze ostetriche e anestesisti o personale di sala operatoria, se necessario." | Uterine inversion | Manuale MSD, Versione per i professionisti: https://www.msdmanuals.com/it/professionale/ginecologia-e-ostetricia/complicanze-intrapartum/inversione-uterina<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/diseases/22326-uterine-inversion |

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| Iperemesi gravidica | Disturbo caratterizzato da nausee e vomito acuto in eccesso rispetto al tipico stato di gravidanza. Colpisce con una certa prevalenza le donne che portano avanti una gravidanza gemellare. | "[…] Se si sospetta un'***iperemesi gravidica*** si dosano i corpi chetonici urinari, l'ormone tireostimolante, gli elettroliti sierici, l'azotemia, la creatinina, aspartato aminotransferasi (AST), alanina aminotransferasi (ALT), magnesio, e fosfato." | Hyperemesis gravidarum | Manuale MSD, Versione per i professionisti: https://www.msdmanuals.com/it/professionale/ginecologia-e-ostetricia/complicanze-prenatali/iperemesi-gravidica<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/diseases/12232-hyperemesis-gravidarum |
| Ipertensione gravidica | Condizione che provoca l'aumento transitorio dei valori di pressione arteriosa dopo la ventesima settimana di gravidanza. Può associarsi a mal di testa, malessere generale, nausea, tachicardia o essere del tutto asintomatica. | "[…] Le categorie con un rischio più elevato di ***ipertensione gravidica*** sono le donne alla prima gravidanza, quelle in attesa di un parto gemellare, donne affette da ipertensione arteriosa cronica , malattie renali, diabete mellito." | Gestational hypertension | FIR, Fondazione Italiana del Rene: https://www.fondazioneitalianadelrene.org/ipertensione-gravidica/#:~:text=Cos%20%C3%A8%20l'ipertensione%20gestazionale,l'una%20dall'altra<br><br>ACOG, The American College of Obstetrics and Gynecologists: https://www.acog.org/clinical/clinical-guidance/practice-bulletin/articles/2020/06/gestational-hypertension-and-preeclampsia |

In Italian, it is also referred to as *ipertensione gestazionale*.

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| Ipossia fetale | Carenza di ossigeno nei tessuti del bambino nel grembo materno. Al feto affluisce meno sangue rispetto alla norma provocando problemi cerebrali e anche la morte. | "[…] Le contrazioni uterine riducono l'ossigenazione e, se il bambino è già in uno stato di sofferenza fetale cronica, si vede che, con la contrazione, si scompensa (sofferenza fetale acuta). Su questo principio si basa la prova con ossitocina: si somministra ossitocina, che determina una contrazione uterina e conseguentemente ***ipossia fetale*** acuta." | Fetal hypoxia | Dott. Vincenzo Alvino, Specialista in Ostetricia e Ginecologia, Perfezionato in Ecografia e Medicina prenatale: http://www.vincenzoalvino.it/benessere-fetale-in-gravidanza.htm<br><br>American Journal of Physiology, C. E. Wood and M. K. Wood, 2019, *Current paradigms and new perspectives on fetal hypoxia: implications for fetal brain development in late gestation*: https://journals.physiology.org/doi/full/10.1152/ajpregu.00008.2019 |

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| Malattia trofoblastica gestazionale | Stato patologico caratterizzato dalla proliferazione di tessuto trofoblastico fetale i cui sintomi possono comprendere un eccessivo ingrossamento dell'utero, vomito, sanguinamento vaginale e preeclampsia, che di solito si manifestano all'inizio della gravidanza. | "[…] Le pazienti con ***malattia trofoblastica gestazionale*** vengono diagnosticate nella maggior parte dei casi casualmente dopo intervento di revisione della cavità uterina a seguito di aborto interno. Si tratta in definitiva di pazienti asintomatiche." | Gestational Trophoblastic Disease, (GTD) | I.R.C.C.S. Ospedale San Raffaele, Gruppo San Donato: https://www.hsr.it/cancer-center/tumori/malattia-trofoblastica-gestazionale<br><br>John Hopkins Disease: https://www.hopkinsmedicine.org/health/conditions-and-diseases/gestational-trophoblastic-disease#:~:text=Gestational%20trophoblastic%20disease%20is%20the,majority%20are%20benign%20(noncancerous) |
| Mastite | Patologia infiammatoria di origine batterica che altera l'aspetto e la funzionalità del seno soprattutto durante l'allattamento. | "[…] L'ascesso è infatti una delle complicanze della ***mastite*** e richiede l'intervento del chirurgo che provvederà all'incisione e al drenaggio del seno colpito dalla mastite." | Mastitis | Ospedale Pediatrico, Bambino Gesù: https://www.ospedalebambinogesu.it/mastite-e-allattamento-97184/<br><br>Mayo Clinic: https://www.mayoclinic.org/diseases-conditions/mastitis/symptoms-causes/syc-20374829 |

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| Oligodramnios | Volume abnorme del liquido amniotico che è inferiore rispetto al previsto per l'età gestazionale. È associato a complicanze materne e fetali. | "[…] L'***oligoidramnios*** può essere sospettato se la dimensione dell'utero è minore del previsto per la data o se i movimenti fetali sono diminuiti; essa può essere evidenziata anche sulla base di risultati ecografici accidentali." | Oligohydramnios | Manuale MSD, Versione per i professionisti: https://www.msdmanuals.com/it/professionale/ginecologia-e-ostetricia/complicanze-prenatali/oligoidramnios<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/diseases/22179-oligohydramnios |
| Pielonefrite post-partum | Infezione batterica che si estende dalla vescica a reni dopo il parto. | "[…] La cistite è frequente durante il periodo del post-partum e una ***pielonefrite*** può verificarsi nel post-partum se i batteri risalgono dalla vescica. L'infezione può iniziare come una batteriuria asintomatica nel corso della gravidanza ed è talvolta associata al cateterismo della vescica attuato per eliminare la distensione vescicale durante e dopo il travaglio." | Postpartum Pyelonephritis | Manuale MSD, Versione per i professionisti: https://www.msdmanuals.com/it/professionale/ginecologia-e-ostetricia/assistenza-al-post-partum-e-disturbi-associati/pielonefrite-post-partum<br><br>European Journal of Obstetrics and Gynecology. L. El Tahaa, T. Bazia, H. Maaloufa, Y. Hasbinib, D. Chamsy, 2021, *The clinical utility of intrapartum screening urinalysis for the prevention of postpartum pyelonephritis*: https://www.ejog.org/article/S0301211 15(21)00205-0/abstract |

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| Placenta accreta | Complicanza che presuppone l'inserzione della placenta nella muscolatura dell'utero determinando un ritardo nel secondamento della placenta. | "[…] Lo spettro della ***placenta accreta*** si verifica più di frequente nelle donne che hanno una placenta previa durante la gravidanze in corso e che hanno avuto un precedente parto cesareo." | Placenta acreta | Manuale MSD, Versione per i professionisti: https://www.msdmanuals.com/it/professionale/ginecologia-e-ostetricia/complicanze-intrapartum/placenta-accreta#Eziologia_v1074422_it<br><br>Mayo Clinic: https://www.mayoclinic.org/diseases-conditions/placenta-accreta/symptoms-causes/syc-20376431 |
| Polidramnios | Valore abnorme del liquido amniotico che presuppone nella maggior parte dei casi una patologia del feto o complicanze materne. | "[…] Se si sospetta un polidramnios, il liquido amniotico deve essere valutato quantitativamente con l'indice del liquido amniotico o con la misurazione singola della tasca più profonda (single deepest pocket [SDP])." | Polyhydramnios | Manuale MSD, Versione per i professionisti: https://www.msdmanuals.com/it/professionale/ginecologia-e-ostetricia/complicanze-prenatali/polidramnios<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/diseases/17852-polyhydramnios |

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| Preeclampsia | Patologia caratterizzata dall'ipertensione materna, dalla proteinuria elevata e da edemi materni. | "[…] La ***preeclampsia*** è abbastanza subdola, spesso, infatti, la donna colpita non ha segnali specifici. I sintomi principali che devono farla sospettare sono due: la pressione alta in gravidanza superiore a 140 di massima e a 90 di minima e la presenza di proteine nelle urine con livelli oltre i 290 mg/l." | Preeclampsia | ASST, Grande Ospedale Metropolitano Niguarda: https://www.ospedaleniguarda.it/news/leggi/preeclampsia-ed-eclampsia-in-gravidanza-di-cosa-si-tratta<br><br>Preeclampsia Foundation: https://www.preeclampsia.org/what-is-preeclampsia |
| Prolasso del cordone ombelicale | Posizione anomala del cordone ombelicale che avviene durante il travaglio causando ipossia fetale. | "[…] In caso di ***prolasso del cordone ombelicale***, l'apporto di ossigeno e sangue al feto possono essere parzialmente o totalmente interrotti." | Umbilical Cord Prolapse | Danni da Parto.Legal, Studio Legale Stefano Gallo: https://www.dannidaparto.legal/danni-prenatali-e-perinatali/complicanze-e-patologie-del-feto-e-del-neonato/prolasso-del-cordone-ombelicale/<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/diseases/12345-umbilical-cord-prolapse |

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| Proteinuria | Quantità anomala di proteine nelle urine. In gravidanza quando i valori superano i 300 mg al giorno. | "[…] Non è inusuale che nelle giovani donne, l'esame delle urine sia eseguito per la prima volta durante la gestazione. Il riscontro di ***proteinuria*** isolata o di microematuria sono condizioni relativamente frequenti." | Proteinuria | SIN, Società Italiana Nefrologia: https://congressi.sinitaly.org/2017/03/22/anomalie-urinarie-in-gravidanza-non-solo-pre-eclampsia/<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/diseases/16428-proteinuria |
| Rivolgimento fetale per manovre esterne | Manovra esterna per cercare di posizione il feto. Si tratta di una delicata pressione sull'addome della paziente spingendo il feto a fare una sorta di capriola. | "[…] Il ***rivolgimento fetale per manovre esterne*** può essere eseguito a partire dalla 37esima settimana di gestazione. E' possibile incontrare i medici ginecologi dell'Unità di Medicina Materno Fetale per avere un counselling sui rischi e benefici di tale manovra, da prenotare intorno alla 35esima settimana di gestazione." | External Cephalic Version, (ECV) | ASST Papa Giovanni XXIII, Ospedale di Bergamo: https://www.asst-pg23.it/le-future-mamme/gravidanza/rivolgimento-fetale<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/treatments/22979-ecv |

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| Rottura artificiale delle membrane, (ARM) | Procedura indolore che si utilizza durante il corso del travaglio se le contrazioni sono rallentate e il bambino non progredisce in modo ottimale. Ci si avvale di uno strumento simile a un uncinetto che viene inserito attraverso la vagina e le membrane che vengono rotte. | "[…] ***Rottura artificiale delle membrane***: in alcuni casi, se il travaglio non procede come previsto, l'ostetrica o il ginecologo possono decidere di rompere artificialmente il sacco amniotico per stimolare il travaglio." | Artificial rupture of membranes, (ARM) | Elena Iannelli, Ostetrica IBCLC: https://www.elenaiannelli.it/rottura-delle-acque/<br><br>NHS, National Health System, Barnsley Hospital: https://www.barnsleyhospital.nhs.uk/services/maternity/your-birth-options/having-your-baby-in-our-birthing-centre/if-labour-has-be-induced/artificial-rupture-of-membranes-arm |

It is also known as 'amniotomy'.

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| Rottura delle membrane | Fuoriuscita del liquido amniotico dai genitali. | "[…] Se il travaglio non inizia entro le 6 – 12 ore dalla ***rottura delle membrane***, infatti, la futura mamma e il bambino vengono maggiormente esposti al rischio di contrarre infezioni." | Rupture Of Membranes, (ROM) | Dott.ssa Cristina Passadore, Medico chirurgo specializzato in Ginecologia e Ostetricia, perfezionata in Omeopatia e Omotossicologia: https://www.cristinapassadore.it/la-rottura-delle-membrane-amniotiche-ginecologo-milano/<br><br>University of Michigan: https://mlabs.umich.edu/tests/point-care-fetal-membrane-rupture-rom |

In Italian, it is commonly known as *rottura delle acque*.

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| Rottura prematura delle membrane amnio-coriali (PROM) | Fuoriuscita del liquido amniotico che avviene almeno ventiquattro ore prima delle trentasette settimane di gravidanza. | "[…] La ***rottura prematura delle membrane amnio-coriali***, consiste nella lacerazione del sacco amniotico prima dell'inizio del travaglio ma, comunque, dopo le 37 settimane di gravidanza (non a caso, si verifica nel 10% dei casi)." | Premature rupture of membranes (PROM) | Studio A Ambrosini, Specialisti in Ginecologia e Ostetricia: https://studioambrosini.org/prom-in-gravidanza-cause-complicazioni-e-come-intervenire/<br><br>CHOP, Children's Hospital of Philadelphia: https://www.chop.edu/conditions-diseases/premature-rupture-membranes-prompreterm-premature-rupture-membranes-pprom#:~:text=Premature%20rupture%20of%20membranes%20(PROM)%20is%20a%20rupture%20(breaking,10%20percent%20of%20all%20pregnancies |

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| Rottura prematura pretermine delle membrane amnio-coriali, (PPROM) | Fuoriuscita del liquido amniotico che si verifica prima delle trentasette settimane di gravidanza. | "[…] La ***rottura pretermine delle membrane amnio-coriali***, cioè la PPROM, invece, consiste nella lacerazione del sacco amniotico prima della 37esima settimana, quindi in largo anticipo rispetto a una completa maturazione del feto. Si tratta di una vera e propria complicazione della gravidanza." | Preterm Premature Rupture of Membranes, (PPROM) | Studio Ambrosini, Specialisti in Ginecologia e Ostetricia: https://studioambrosini.org/prom-in-gravidanza-cause-complicazioni-e-come-intervenire/<br><br>Icahn School of Medicine at Mount Sinai: https://www.mountsinai.org/health-library/special-topic/premature-rupture-of-membranes |
| Rottura spontanea delle membrane, (SROM) | Fuoriuscita del liquido amniotico esattamente dopo trentasette settimane di gravidanza, durante o dopo il travaglio. | "[…] Esistono due tipi principali di rottura delle acque:<br>***Rottura spontanea delle membrane***: è quella che avviene naturalmente, solitamente durante il travaglio, ma può accadere anche prima dell'inizio delle contrazioni." | Spontaneous Rupture of The Membranes, (SROM) | Elena Iannelli, Ostetrica IBCLC: https://www.elenaiannelli.it/rottura-delle-acque/<br><br>Spinning Babies: https://www.spinningbabies.com/once-the-water-releases/ |

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| Rottura uterina | Lesione della parete dell'utero con grave emorragia interna. | "[…] La sintomatologia della ***rottura uterina*** comprende bradicardia fetale, decelerazioni variabili, evidenza di ipovolemia, perdita della collocazione fetale (rilevata durante l'esame del collo dell'utero), e intenso o costante dolore addominale." | Uterine rupture | Manuale MSD, Versione per i professionisti: https://www.msdmanuals.com/it/professionale/ginecologia-e-ostetricia/complicanze-intrapartum/rottura-uterina<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/diseases/24480-uterine-rupture |
| Sepsi | Infezione generalizzata dovuta al passaggio nel circolo sanguigno di microrganismi che provengono da altre sedi. Può interessare uno o più organi e può comprometterne la funzionalità. | "[…] Riconoscere tempestivamente i sintomi della ***sepsi*** e intervenire per tempo, permette di evitare l'insorgere di patologie gravi o arrivare addirittura al decesso della partoriente." | Sepsis | Periplo Familiare: https://www.periplofamiliare.it/blog/ritardo-nella-diagnosi-di-sepsi-puerperale-cosa-fare-e-a-chi-rivolgersi/<br><br>Global Sepsis Alliance: https://globalsepsisalliance.org/ |

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| Sofferenza fetale | Condizione in cui non giunge abbastanza sangue e ossigeno al feto. Può essere cronica, placenta vecchia, o acuta, con un nodo nel funicolo. | "[…] Una frequenza cardiaca anomala è il principale segno di ***sofferenza fetale***, motivo per cui le ostetriche e/o il ginecologo devono monitorarla durante l'intero processo del travaglio e del parto." | Fetal distress | Studio Legale Stefano Gallo: https://studiolegalestefanogallo.it/2023/09/04/danni-al-neonato-da-sofferenza-fetale/<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/diseases/23971-fetal-distress |

# Strumentazione, set parto e tecniche chirurgiche

# Instruments, delivery sets and surgical techniques

## Historical background and instruments

In the early days of humanity, childbirth was mainly a natural and family-oriented experience, usually taking place at home with the help of midwives, female relatives, or other women from the community. With limited medical knowledge, childbirth often posed significant risks and uncertainties for both the mother and the child.

Childbirth is one of the most important events in human life, and the practices surrounding it have changed significantly over the years. From ancient times, the history of childbirth practices reflects humanity's creativity, cultural beliefs, and advancements in science.

The ancient Egyptians were pioneers in documenting childbirth practices. The Ebers Papyrus, dating back to around 1550 BCE, is one of the oldest known medical texts and contains references to childbirth and gynecological treatments. Women in ancient Egypt typically gave birth in a squatting position, which was thought to help with the delivery by using gravity to their advantage. Midwives, who held a respected position in society, played a vital role during childbirth. They used various herbal remedies and potions to ease pain and encourage labor, although there was limited knowledge about the anatomy of childbirth and the potential risks involved.

In ancient Greece, obstetrics and gynecology were viewed as distinct disciplines. Greek physicians, such as Hippocrates (c. 460 – c. 370 BCE), were pioneers in documenting childbirth and women's health. However, it was the Roman physician Soranus of Ephesus[54] (c. 98 – c. 138 CE) who provided more comprehensive accounts of labor and delivery.

[54] Prominent Greek medical writer and practitioner from the 1st and 2nd centuries AD, known primarily for his contributions to gynecology and obstetrics. He practiced in Rome but was originally from Ephesus (in modern-day Turkey).

He recommended the lithotomy position (lying on the back with legs elevated) for childbirth, a practice that later became common in medieval Europe. Although the ancient Greeks and Romans lacked advanced medical instruments for childbirth, they utilized basic tools like forceps and various herbal remedies to help alleviate pain.

During the medieval period, childbirth was primarily managed by midwives, with medical intervention being quite uncommon. Most births took place at home, and women frequently gave birth in kneeling or squatting positions, reminiscent of ancient traditions. Midwives relied on basic tools like knives or scissors to cut the umbilical cord and utilized various herbs to alleviate pain or encourage labor. During the Renaissance, there was a growing focus on understanding the anatomy of pregnancy and childbirth. Notable figures like the French physician François Rousset[55] in the 16th century started to document the use of various instruments in obstetrics. His contributions to the field set the stage for the development of forceps, which were later improved upon by others, including Peter Chamberlen[56] in the 17th century.

The Chamberlen family is recognized for creating the first modern obstetric forceps, a crucial tool for assisted deliveries.

[55] François Rousset, a distinguished physician of the Renaissance era, significantly contributed to the advancement of medical knowledge through his detailed anatomical studies and clinical writings, bridging the gap between medieval traditions and early modern scientific approaches.

[56] Peter Chamberlen, a pioneering 17th-century English obstetrician, is renowned for his innovative contributions to childbirth practices, notably the development and secret use of the obstetrical forceps, which revolutionized the management of complicated deliveries.

*Picture 13 Plate showing the birth of a baby using forceps from L'art des accouchemens, by Jean Louis Baudelocque Published, 1781. Source: Juliamartins, Living History.*

The use of instruments during childbirth started off quite basic but became increasingly important as our understanding of the process grew. Initially, these tools were created to tackle complications in labor, like obstructed or prolonged deliveries, which were significant contributors to maternal and fetal mortality.

For instance, an example of great progress is the obstetric bed, which was developed during the 17th and 18th centuries. In the 1600s, the "obstetric chair" or "birthing stool" was the standard for deliveries. However, as medical understanding improved, the design of the birthing bed changed, especially with the introduction of the lithotomy position. The obstetric bed became a more comfortable and practical option for both the patient and the physician, facilitating better positioning of the woman in labor for assisted deliveries.

**The use of the Epidural and Anesthesia**

In earlier times, the absence of anesthesia made childbirth a painful experience, but the introduction of pain relief marked a significant advancement in obstetrics. The 19th century saw the groundbreaking discoveries of ether in 1846 and chloroform in 1847, which changed both surgical and obstetric practices. The use of chloroform by Queen Victoria[57] during the birth of her eighth child in 1853 highlighted the advantages of anesthesia in childbirth. However, it wasn't until the 20th century that modern epidural anesthesia was created, offering substantial relief to women in labor and changing the childbirth experience dramatically.

Recent advancements in anesthesia techniques have played a vital role in reducing postoperative discomfort. Many gynecologic surgeries now employ regional anesthesia methods, like epidurals or spinal blocks, to lessen the necessity for general anesthesia and its associated side effects. Furthermore, the implementation of multimodal pain management strategies, which include non-opioid analgesics, nerve blocks, and local anesthetics, has helped reduce dependence on opioids, thereby lowering the risk of addiction and other complications.

In today's world, childbirth is significantly safer and more managed due to advancements in medical technology and a better understanding of obstetrics. Many women now choose to give birth in hospitals, where they receive care from obstetricians, midwives, and nurses.

[57] Schwarcz, J. (2022). *Anesthesia à la Reine*. Office for Science and Society - McGill University. (last consultation 01 June 2025): https://www.mcgill.ca/oss/article/medical-history/anesthesia-la-reine

The risks associated with caesarean sections have decreased, and the introduction of tools such as fetal heart rate monitors, ultrasounds, and vacuum extractors allows obstetricians to quickly identify and respond to any complications that may arise. Instead, for managing pain during labour, obstetricians have several anaesthesia options at their disposal, such as epidurals, spinal blocks, and local anaesthesia. The tools used to deliver these treatments consist of needles, catheters, and syringes.[58]

The introduction of epidural anaesthesia has greatly mitigated pain during labour for numerous women. Additionally, advancements in robotic surgery, fetal surgery, and minimally invasive techniques have enhanced the precision and safety of childbirth procedures.

Gynaecologic surgery has seen remarkable progress over the last few decades, thanks to advancements in medical technology, the adoption of minimally invasive techniques, and enhanced surgical strategies. These improvements have not only made procedures more precise but have also reduced the risks and recovery times associated with gynaecologic surgeries. Consequently, women facing surgeries for issues like fibroids, endometriosis, ovarian cysts, and reproductive system cancers now enjoy better outcomes and an improved quality of life.

Minimally invasive surgery (MIS), encompassing laparoscopy and hysteroscopy, has transformed gynecology. These methods utilize smaller incisions, cause less tissue damage, and promote quicker recovery than conventional open surgery, providing substantial advantages for patients.

[58] Wang LH, Seow KM, Chen LR, Chen KH. *The Health Impact of Surgical Techniques and Assistive Methods Used in Cesarean Deliveries*: A Systemic Review. Int J Environ Res Public Health. 2020 Sep 21;17(18):6894. doi: 10.3390/ijerph17186894. PMID: 32967222; PMCID: PMC7558715.

- **Laparoscopy**: It is commonly known as "keyhole surgery," utilizes a small camera called a laparoscope along with specialized instruments that are inserted through tiny incisions to carry out surgical procedures. In the field of gynecology, laparoscopy is employed to address various conditions, such as the removal of ovarian cysts, fibroids, and endometriosis, in addition to sterilization procedures and tubal ligation. The benefits of laparoscopy include smaller scars, less blood loss, shorter hospital stays, and quicker recovery times.

  The ability to perform complex surgeries with accuracy via small incisions has greatly enhanced patient results.

  For instance, laparoscopic myomectomy can be done without requiring a large abdominal cut, leading to reduced postoperative discomfort and a faster return to everyday activities. Laparoscopic techniques are increasingly utilized for staging gynecologic cancers, particularly ovarian cancer.

  These minimally invasive methods allow surgeons to evaluate the extent of cancer spread, enabling them to make better-informed decisions about the necessity of additional surgical procedures or adjuvant therapies like chemotherapy.

- **Hysteroscopy**: It is another minimally invasive technique that involves inserting a hysteroscope through the cervix into the uterus. Surgeons can directly see inside the uterus, enabling them to carry out procedures like removing uterine polyps, fibroids, or adhesions, and treating issues such as uterine septa or abnormal bleeding. Hysteroscopic procedures are usually performed on an outpatient basis, which helps reduce recovery time and eliminates the necessity for more invasive surgeries like hysterectomies.

Additionally, it has proven to be extremely useful for diagnosing uterine conditions, including endometrial cancer and abnormal uterine bleeding, by allowing for direct visualization and biopsy.

- **Episiotomy**: It is a surgical incision made in the perineum, which is the area between the vagina and anus, to widen the vaginal opening and make delivery easier. After the baby is born, the incision is carefully closed with stitches. The surgical technique requires a high level of skill to ensure that the incision is made accurately and to promote proper healing. The episiotomy kit contains specific scissors, sutures, and various tools designed to carry out the procedure safely.
- **Myomectomy**: It involves surgically removing fibroids from the uterus, typically when these growths lead to symptoms like pain, heavy bleeding, or infertility. The procedure can be carried out via abdominal surgery or laparoscopically, depending on the size and position of the fibroids. The decision to undergo a myomectomy depends on several factors, including the size, number, and location of the fibroids, as well as the patient's symptoms, age, and desire for future fertility.

**Equipment, delivery sets and surgical techniques**

Gynaecology and obstetrics involve the use of specialized equipment, delivery sets, and surgical techniques to ensure the health and safety of both the mother and the child. These tools and procedures are essential for diagnosing, managing, and treating a range of reproductive health concerns, as well as for ensuring safe childbirth.

Gynaecology focuses on diagnosing and treating issues related to the female reproductive system, which includes the uterus, ovaries, cervix, and vagina. Gynaecologists utilize a range of instruments and equipment to conduct routine exams, procedures, and surgeries. For instance, gynaecological examinations are usually conducted on a specialized exam table that prioritizes comfort and accessibility.

These tables are adjusted to support various positions, including the lithotomy position, where the patient lies on their back with legs elevated and spread apart. Bright lights are utilized to clearly illuminate the pelvic area during the examination.

The obstetrician may need to use a delivery set to help the woman during labour. A delivery set is a complete collection of instruments and tools essential for the safe delivery of a baby. Typically, a delivery set includes: a scalpel, used for making an incision if a C-section is required; forceps and vacuum extractors, which help in delivering the baby when needed, particularly in situations of prolonged labour or foetal distress; scissors, used for cutting the umbilical cord; cord clamp, to secure the umbilical cord once it is cut; surgical drapes to ensure a sterile environment throughout the procedure. Additionally, equipment like fetal monitors, ultrasound machines, and examination tables play a crucial role in evaluating and managing the health of both the mother and baby during pregnancy and labour.

*Picture 14 Sims Speculum Medium, Graves Speculum Medium, Sims Uterine Scissors Curved, Uterine Hegar Dilator, Rampley Sponge Forceps, Teale Vulsellum Forceps. Source: Surgical Mart 9 Pcs Gynecology Set.*

The set also includes sutures for repairing any vaginal or perineal tears, cord clamps to secure the umbilical cord, and gauze and surgical drapes to keep the environment sterile. This delivery set is designed to handle both routine and emergency situations, ensuring that the obstetric team is ready for any challenges that may arise during childbirth.

**The development of instruments**

The history of childbirth practices and instruments reflects a journey of gradual advancement, influenced by cultural beliefs, medical breakthroughs, and technological innovations. From ancient times to modern age, the evolution of childbirth has significantly enhanced the health of mothers and infants, thanks to advanced surgical techniques, effective pain relief options, and life-saving technologies that are now widely available.

The evolution of delivery like the speculum and epidurals, along with improvements in infection control and anaesthesia, has made childbirth a significantly safer experience.

This evolution has significantly changed childbirth from a predominantly natural process to a medicalized event that can be effectively managed, even in complicated situations.

From the basic tools used by midwives in the past to the advanced technologies we have today, every improvement in delivery instruments has led to better outcomes for both mothers and their babies. As medical science advances, we can expect even more innovations in delivery instruments, further improving the safety and experience of childbirth for women globally. Technological progress and less invasive surgical techniques have significantly enhanced the quality of care, leading to faster recoveries, reduced complications, and improved outcomes for both mothers and their babies.

Future delivery methods are expected to improve the safety and emotional aspects of childbirth, making sure that each birth is as safe and positive as it can be.

Modern delivery techniques combine medical innovation, a focus on patient-centered care, and a thorough understanding of the complexities involved in childbirth. As medical science advances, we can expect the future of childbirth practices to introduce even more innovations focused on enhancing safety, comfort, and outcomes for both women and their children.

From improved pain management options such as epidurals to the implementation of cutting-edge technologies for monitoring fetal health, modern delivery methods focus on ensuring the safety and comfort of both mothers and their babies.

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| Amniocentesi | Operazione di prelievo del liquido amniotico che viene effettuato, per via transaddominale, con un sottile ago sotto controllo ecografico. | "[…] La durata complessiva del prelievo è di pochi minuti e viene preceduto da uno studio ecografico del feto dalla durata di 20 minuti circa, per cui la durata totale dell'***amniocentesi*** è di 30 minuti: può richiedere più tempo solo nel caso in cui la placenta dovesse trovarsi nella parte anteriore dell'utero." | Amniocentesis | IRCCS, Università Cattolica del Sacro Cuore, Fondazione Policlinico Universitario Agostino Gemelli: https://privato.policlinicogemelli.it/approfondimenti/amniocentesi/<br><br>Mayo Clinic: https://www.mayoclinic.org/tests-procedures/amniocentesis/about/pac-20392914 |
| Annessiectomia | Operazione chirurgica che consiste nella rimozione chirurgica delle ovaie e delle tube di Falloppio. Può essere monolaterale o bilaterale. | "[…] La mutazione dei geni BRCA1 e BRCA2 aumenta il rischio nella donna di sviluppare diversi tumori, i più frequenti al seno e alle ovaie. In questo caso l'***annessiectomia*** viene utilizzata a scopo profilattico e deve essere bilaterale." | Adnexectomy | IRCCS, Università Cattolica del Sacro Cuore, Fondazione Policlinico Universitario Agostino Gemelli: https://privato.policlinicogemelli.it/approfondimenti/annessiectomia/<br><br>Mayo Clinic, School of Continous Professional Development: https://ce.mayo.edu/surgical-specialties/content/mayo-clinic-advances-vaginal-hysterectomy-and-associated-procedures-2016 |

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| Cardiotocografo | Macchinario che registra la frequenza cardiaca fetale e l'intensità delle contrazioni uterine. | "[…] Il ***cardiotocografo*** è dotato di due sonde che vengono appoggiate sull'addome della donna. La prima è una sonda a ultrasuoni, come quella dell'ecografo, e serve a rilevare il battito cardiaco fetale." | Cardiotocograph | Prof. Massimo Giovannini, Medico Chirurgo specializzato in ostetricia e ginecologia: https://www.massimogiovannini.info/cardiotocografia.asp<br><br>Cornell University, M. O'Sullivan, T. Gabruseva, G. Boylan, M. O'Riordan, G. Lightbody, W. Marnane, 2017, *Classification of fetal compromise during labour: signal processing and feature engineering of the cardiotocograph*: https://arxiv.org/abs/2111.00517 |

It is also known as CTG monitor.

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| Cardiotocografia | Esame che consente di monitorare la frequenza cardiaca fetale e le contrazioni uterine. | "[…] Per eseguire una ***cardiotocografia*** si applicano sull'addome materno due trasduttori: uno per la registrazione della frequenza cardiaca fetale ed uno per la registrazione dell'eventuale attività contrattile." | Cardiotocography (CTG) | Artemisia Lab, Rete di centri clinici diagnostici: https://artemisialab.it/prodotto/cardiotocografia-monitoraggio-gravidanza/<br><br>Dr. Emeil Kamel, Obstetrician, Gynaecologist & Laparoscopic Surgeon: https://www.dremeilkamel.com.au/patient-resources/obstetrics/cardiotocography/ |

It derives from the Greek words *καρδία* 'heart', *τόκος* 'birth' and *γραφία* 'to write'

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| Cromo salpingoscopia | Esame ginecologico che consiste nell'iniettare attraverso l'utero un liquido blu di metilene tramite uno specifico catetere intrauterino. Il test ci dice se le tube sono occluse o pervie, se sono regolari o tortuose. | "[…] In genere la paziente non avverte dolore in questa fase e può seguire la procedura guardando il monitor. Qualche fastidio è avvertito, invece, per l'applicazione dello speculum (che serve per evidenziare il collo dell'utero) e per l'introduzione del catetere intrauterino per la ***cromosalpingoscopia***." | Chromo pertubation | Dott. Massimiliano Pellicano, Ginecologia, Laparoscopia, Endometriosi, Infertilità di coppia: https://www.massimilianopellicano.it/infertilita/fertiloscopia/<br><br>TGH, Tampa General Hospital: https://www.tgh.org/institutes-and-services/testing-and-diagnostics/chromopertubation |

In Italian, it is commonly known as *prova di pervietà tubarica*.

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| Dilatazione ed evacuazione (D&E) | Procedura chirurgica utilizzata per interrompere una gravidanza, spesso dopo le 16 settimane di gestazione. Comporta l'apertura della cervice e il successivo svuotamento dell'utero mediante aspirazione. | "[…] La dilatazione e il raschiamento (D&E) o la ***dilatazione ed evacuazione (D&E)*** sono procedure eseguite dall'operatore sanitario quando l'utero ha espulso i tessuti del feto o se una donna ha un'emorragia abbondante." | Dilation and evacuation (D&E) | Apollo Hospitals: https://www.apollohospitals.com/it/diseases-and-conditions/miscarriage-types-symptoms-causes-diagnosis-and-treatment#:~:text=Trattamento%20chirurgico,donna%20ha%20un'emorragia%20abbondante.<br><br>Saint Luke's: https://www.saintlukeskc.org/health-library/understanding-dilation-and-evacuation-de |

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| Dilatazione e raschiamento (D&C) | Procedura chirurgica che prevede la dilatazione della cervice e il raschiamento dell'endometrio attraverso l'ausilio di una curetta. Tale procedura viene eseguita per il trattamento di alcune patologie e la pulizia dell'utero dopo un aborto o un aborto spontaneo. | "[…] La ***D&C*** viene spesso eseguita per diagnosticare o trattare varie condizioni, come sanguinamento mestruale abbondante, aborto spontaneo o crescita anomala del tessuto. Può essere eseguita anche dopo il parto per liberare l'utero." | Dilation and curettage (D&C) | Edha Care, Strenght and Happiness: https://www.edhacare.com/it/treatments/gynecology/dilation-and-urettage<br><br>Johns Hopkins Medicine: https://www.hopkinsmedicine.org/health/treatment-tests-and-therapies/dilation-and-curettage-d-and-c |
| Dispositivo intrauterino (DIU) | Tipologia di metodo contraccettivo inserito all'interno dell'utero per prevenire la gravidanza. Può essere di due categorie: a rame e ormonale con rilascio di progesterone. | "Il ***dispositivo intrauterino*** o meglio conosciuto come "spirale" nasce nel 1928 come metodo contraccettivo, anche se già dai tempi di Ippocrate si era dimostrato l'effetto contraccettivo di un corpo estraneo collocato nell'utero di animali." | Intrauterine Contraceptive Device (IUCD) | Poliambulatorio ZetaMedica: https://www.zetamedica.it/donna/contraccezione-il-dispositivo-intrauterino-iud/<br><br>The Ectopic Pregnancy Trust: https://ectopic.org.uk/reasons-for-an-ectopic-pregnancy/intrauterine-devices-and-ectopic-pregnancy |

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| Doppler fetale | Strumento di monitoraggio dello stato di salute del bambino, che ha il compito di misurare la velocità e la quantità di sangue presente nei vasi sanguigni del feto. | "[…] Solitamente il ***doppler fetale*** è in grado di controllare 3 zone specifiche:<br>1. Arteria cerebrale media: gestisce il flusso sanguigno che dalla placenta arriva al cuore<br>2. Arteria ombelicale: permette al sangue di passare attraverso il cordone ombelicale e confluire nei vasi sanguigni<br>3. Arteria uterina: arteria che porta il sangue dall'utero alla placenta." | Fetal doppler | TEXA, Biomedical Technology: https://www.texabiomedicali.it/doppler-fetale-come-funziona-e-come-si-usa/<br><br>Australian Government, Department of Health and Aged Care. Theraputic Goods Administration: https://www.tga.gov.au/news/safety-alerts/home-use-fetal-dopplers-heartbeat-monitor |
| Episiotomia | Incisione perineale per facilitare il passaggio del feto durante il parto vaginale. | "[…] Tuttavia una sintesi dei risultati degli studi disponibili mostra che il ricorso di routine all'***episiotomia*** non riduce il rischio di incontinenza urinaria e fecale, non aiuta a ridurre i dolori perineali che si possono avere dopo il parto e comporta una minore probabilità di riprendere precocemente i rapporti sessuali." | Episiotomy | Servizio Sanitario Regionale, Emilia Romagna. SaPeRiDoc, Centro di documentazione sulla salute perinatale e riproduttiva: https://www.saperidoc.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/56<br><br>Mayo Clinic: https://www.mayoclinic.org/healthy-lifestyle/labor-and-delivery/in-depth/episiotomy/art-20047282 |

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| Isterectomia | Intervento chirurgico con il fine di asportare l'utero. Può essere eseguita per via laparotomica o vaginale. | "L'***isterectomia*** è ancora oggi l'intervento più praticato in ambito ginecologico e consiste nell'asportazione dell'utero e delle salpingi." | Hysterectomy | I.R.C.C.S, Ospedale San Raffaele, Gruppo San Donato: https://www.hsr.it/news/2024/ottobre/isterectomia-intervento-conseguenze<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/procedures/hysterectomy |

In Italian, it is commonly known as *idrolaparoscopia transvaginale.*

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| Fertiloscopia | Tecnica diagnostica mininvasiva che consente la visualizzazione della pelvi posteriore mediante l'introduzione di un'ottica, previa anestesia generale o anestesia locale. | "Nell'ultimo decennio si va sempre di più affermando la ***fertiloscopia***, una nuova tecnica diagnostica mininvasiva che costituisce una buona alternativa alla laparoscopia diagnostica, procedura standard, ma sicuramente non innocua, capace molto spesso di rilevare patologie in pazienti asintomatiche." | Fertiloscopy | Dott. Massimiliano Pellicano, Ginecologia, Laparoscopia, Endometriosi, Infertilità di coppia: https://www.massimilianopellicano.it/news/la-fertiloscopia-diagnostica-e-operativa/<br><br>IRML, Illawara, Reproductive Medicine and Laparascopy: https://www.irml.com.au/fertiloscopy.html |

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| Isterectomia sopracervicale laparoscopica (LSH) | Intervento chirurgico di rimozione dell'utero dove viene tutelata la cervice. | "[…] In un'***isterectomia sopracervicale laparoscopica***, la cervice viene lasciata intatta. Questa opzione spesso si traduce in un intervento chirurgico più rapido e sicuro, ma può causare spotting mensile." | Laparoscopic Supracervical Hysterectomy (LSH) | Medicover Hospitals: https://www.medicoverhospitals.in/it/articles/laparoscopic-hysterectomy<br><br>WK, Willis-Knighton Health System: https://www.wkhs.com/health-resources/wk-health-library/medical-procedures-tests-care-and-management/a-z/laparoscopic-supracervical-hysterectomy-(lsh) |

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| Isterectomia totale laparoscopica (TLH) | Operazione chirurgica volta alla rimozione dell'utero. Viene eseguita per via laparoscopica con 4 piccole incisioni di circa 5 mm a livello addominale. | "[…] Un utero non prolassato non costituisce una controindicazione all'isterectomia vaginale o all'isterectomia vNOTES. Kaya e colleghi hanno confrontato la TLH (***isterectomia laparoscopica totale***) con l'isterectomia vNOTES per uteri ritenuti di grandi dimensioni e hanno scoperto che il gruppo sottoposto a isterectomia vNOTES aveva un tempo operatorio significativamente più breve (45 vs 160 minuti), una degenza ospedaliera (48 vs 72 ore) e un tempo di degenza inferiore di 24 ore. punteggio del dolore." | Total Laparoscopic Hysterectomy (TLH) | The International Society for Gynecologic Endoscopy, *Cos'è l'isterectomia vNOTES e perché è importante*, Anneli Linnamägi: https://www.isge.org/it/2024/03/what-is-vnotes-hysterectomy-and-why-it-is-important/<br><br>St. George Surgical Center: https://www.stgeorgesurgical.com/procedure/total-laparoscopic-hysterectomy-tlh/ |

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| Laparotomia | Intervento chirurgico volto ad aprire la cavità addominale a scopo operativo. | "[…] Le complicanze di una ***laparotomia*** possono essere specifiche del sito chirurgico o generali, e sono influenzate da fattori dipendente dal paziente, dall'operatore e dell'operazione stessa." | Laparotomy | Università degli Studi di Napoli, Federico II: https://www.chirurgiafegatopancreas.unina.it/it/procedure/tecniche-chirurgiche/laparotomia/<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/treatments/24767-laparotomy |

In Italian, it is also referred to as *laparatomia*.

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| Miomectomia | Intervento chirurgico atto alla rimozione dei fibromi uterini con l'asportazione del mioma (sottosieroso, intramurale, peduncolato) o dei miomi con l'enucleazione della lesione uterina. | "[…] Nella ***miomectomia*** laparoscopica, invece, si devono eseguire alcune incisioni, ma di dimensioni ridotte, con conseguenti cicatrici meno visibili: queste permettono l'accesso dei soli strumenti chirurgici e di una videocamera, per poter avere una visione dettagliata della zona da operare." | Myomectomy | IRCCS, Università Cattolica del Sacro Cuore, Fondazione Policlinico Universitario Agostino Gemelli: https://privato.policlinicogemelli.it/approfondimenti/miomectomia/<br><br>Johns Hopkins Medicine: https://www.hopkinsmedicine.org/health/treatment-tests-and-therapies/myomectomy-hysteroscopic-laparoscopic-abdominal#:~:text=Myomectomy%20is%20surgery%20to%20remove,become%20pregnant%20after%20the%20procedure. |
| Salpingectomia | Intervento chirurgico di asportazione delle salpingi, ossia di una o entrambe le tube di Falloppio. | "[…] L'intervento di ***salpingectomia*** si effettua in anestesia generale, in genere attraverso un accesso laparoscopico, attraverso piccole incisioni a livello addominale, o laparotomico, attraverso un'incisione più grande." | Salpingectomy | IRCCS, Università Cattolica del Sacro Cuore, Fondazione Policlinico Universitario Agostino Gemelli: https://privato.policlinicogemelli.it/approfondimenti/salpingectomia/<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/treatments/21879-salpingectomy |

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| Speculum vaginale di Cusco | Strumento ginecologico in plastica utilizzato per visualizzare la vagina e la cervice durante l'inserimento di D&C (dilatazione e raschiamento dell'utero), D&E (dilatazione ed evacuazione), nonché l'inserimento di IUCD (intrauterine contraceptive device) e l'esame pelvico regolare. | "[…] L'ampio diametro dello ***speculum vaginale di Cusco*** consente al ginecologo di inserire strumenti nella vagina durante varie procedure." | Cusco's speculum | Surtex Instruments: https://surtex-instruments.com/it/PRODOTTI/Speculum-vaginale-vergine-di-cusco/<br><br>GerMed USA: https://www.germedusa.com/p-13160-cusco-speculum.aspx |
| Speculum vaginale di Sims | Strumento ginecologico utilizzato in procedure diagnostiche ginecologiche per visualizzare il tratto riproduttivo femminile. Offre una migliore visualizzazione delle pareti vaginali. | "[…] Ha un design liscio e un peso leggero che riducono l'affaticamento dell'utente durante le procedure lunghe. Inoltre, lo ***speculum vaginale di Sims*** è disponibile in set di 3 misure per diverse esigenze anatomiche." | Sims' vaginal speculum | Surtex Instruments: https://surtexinstruments.com/it/PRODOTTI/speculum-vaginale-di-Sims/<br><br>Unicat MSF: https://unicat.msf.org/cat/product/14241 |

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| Stetoscopio di Pinard | Strumento adoperato nella pratica ostetrica con lo scopo di accostarlo al ventre materno per l'auscultazione. | "[…] L'auscultazione intermittente può essere fatta con ***stetoscopio di Pinard*** o strumento Doppler, annotata in cartella o nel partogramma con data, ora e firma; si consiglia tuttavia, se possibile, l'utilizzo del cardiotocografo, per la maggior facilità di interpretazione e la possibilità di conservare un supporto cartaceo." | Pinard stethoscope | La Review dell'Ostetrica: https://lareviewdellostetrica.com/2017/05/07/misurazione-del-battito-cardiaco-fetale-nella-valutazione-iniziale-della-donna-travaglio-auscultazione-intermittente-ctg-continua-gli-studi/<br><br>Doctors Without Borders: https://msfwarehouse.ca/products/pinard-horn#:~:text=Also%20known%20as%20a%20Pinard,electric%20or%20battery%2Dpowered%20counterparts. |

It was named after Dr Pinard (1844 - 1934), a famous French obstetrician. It is also known as 'Pinard's horn'.

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| Test NIPT, Non Invasive Prenatal Test | Test prenatale che non comporta rischi per il feto o per la madre evitando il ricorso all'esecuzione di test prenatali invasivi, come amniocentesi e villocentesi. | "[…] Oltre alla rilevazione delle trisomie, il ***test NIPT*** può anche essere utilizzato per identificare altre anomalie cromosomiche, come le aneuploidie dei cromosomi sessuali e alcune anomalie strutturali." | Non Invasive Prenatal Test (NIPT) | Centro Medico Buonarotti, Direttore Sanitario – Dott.sa Guia Carminati: https://www.centromedicobuonarroti.it/approfondimenti/nipt-test-dna-fetale-cos%E2%80%99-cosa-serve-come-funziona-quando-si-fa-tempi-risultati<br><br>NITA Polyclinic & Diagnostic Center: https://www.nitapolyclinic.com.np/diagnostic-test/popular-lab-tests/non-invasive-prenatal-test-nipt |

In Italian, it is also known as *test DNA fetale*.

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| Villocentesi | Operazione invasiva che consiste nel prelievo di una piccola porzione di villi coriali. Il tessuto prelevato è sottoposto ad analisi di laboratorio che permettono di costruire la mappa cromosomica del feto per diagnosticare eventuali anomalie congenite. | "[…] La ***villocentesi*** deve essere eseguita necessariamente entro il terzo mese di gravidanza, in particolare è indicata l'esecuzione dell'esame dopo la decima settimana di gestazione, tra l'11° e la 13° settimana." | Chorionic Villus Sampling (CVS) | IRCCS, Università Cattolica del Sacro Cuore, Fondazione Policlinico Universitario Agostino Gemelli: https://privato.policlinicogemelli.it/approfondimenti/villocentesi/<br><br>Johns Hopkins Medicine: https://www.hopkinsmedicine.org/health/treatment-tests-and-therapies/chorionic-villus-sampling-cvs |

# Sviluppo del feto: Anatomia

# Foetus development: Anatomy

**The journey from fertilization to embryo**

Embryology involves the series of processes that transform a single fertilized egg, known as a zygote, into a fully developed organism. In humans, this process is intricate and carefully controlled, occurring in specific stages. Studying embryology offers crucial insights into human development, congenital disorders, and medical fields like stem cell research and reproductive medicine.

Embryonic development starts at fertilization, which happens when a sperm cell from the male merges with an ovum from the female. This fusion takes place in the fallopian tube and leads to the creation of a zygote, a single-cell organism that contains a full set of 46 chromosomes.

Fertilization marks the point at which genetic material from both parents comes together to form a distinct genetic blueprint for the offspring. After fertilization, the zygote starts to undergo rapid cell division. As it divides, it creates a cluster of cells known as a morula. This stage lasts around three days and eventually leads to the development of a hollow structure called the blastocyst, which includes an inner cell mass, the trophoblast, and the blastocoel. The blastocyst implants itself into the uterine wall in a process known as implantation, which usually takes place about 6 to 7 days after fertilization.[59]

By the end of the first week, the cells in the morula start to differentiate and reorganize. This process leads to the creation of the blastocyst. The outer layer of the blastocyst, known as the trophoblast, will help form the placenta, while the inner cell mass will develop into the embryo.

After this period, the blastocyst attaches to the endometrium. The trophoblast cells release enzymes that help the blastocyst embed itself into the uterine wall, a crucial step for nutrient exchange between the mother and the developing embryo. The cells of the inner mass start to differentiate into two layers: the epiblast and the hypoblast, which play a role in forming the yolk sac and other supporting structures.

Organogenesis starts following the creation of the germ layers during gastrulation, an earlier stage in embryonic development.

[59] Cleveland Clinic, Blastocyst. What are the steps in fertilization and embryonic development? (Last consultation 28 May 2025): https://my.clevelandclinic.org/health/body/22889-blastocyst?_

The embryonic period is a crucial time when the basic structures of all major organ systems are formed. Throughout this phase, the embryo experiences significant changes in both its structure and function.
Around three weeks after fertilization, gastrulation takes place changing the bilayered embryo (composed of the epiblast and hypoblast) into a trilaminar disc.

This disc consists of three germ layers:

- **Ectoderm**: This outermost layer develops into the skin, the nervous system, and sensory organs.
- **Mesoderm**: The middle layer consists of the muscles, bones, circulatory system, kidneys, and reproductive organs.
- **Endoderm**: The innermost layer lines the digestive and respiratory tracts, along with organs such as the liver and pancreas.[60]

By the end of the fourth week, the embryo starts to develop a more recognizable shape, with basic versions of the heart, circulatory system, and limbs beginning to form.[61] The heart starts beating and pumping blood by the end of week four. Somites, which are groups of mesodermal cells, develop alongside the neural tube and will eventually form the vertebrae, muscles, and skin. The limb buds also emerge, setting the stage for the future development of arms and legs.

During the 5$^{th}$ and 6$^{th}$ weeks, the face starts to take shape, with early features like the eyes, nostrils, and mouth beginning to form. Additionally, the organs of the digestive system, including the stomach and intestines, begin their development.

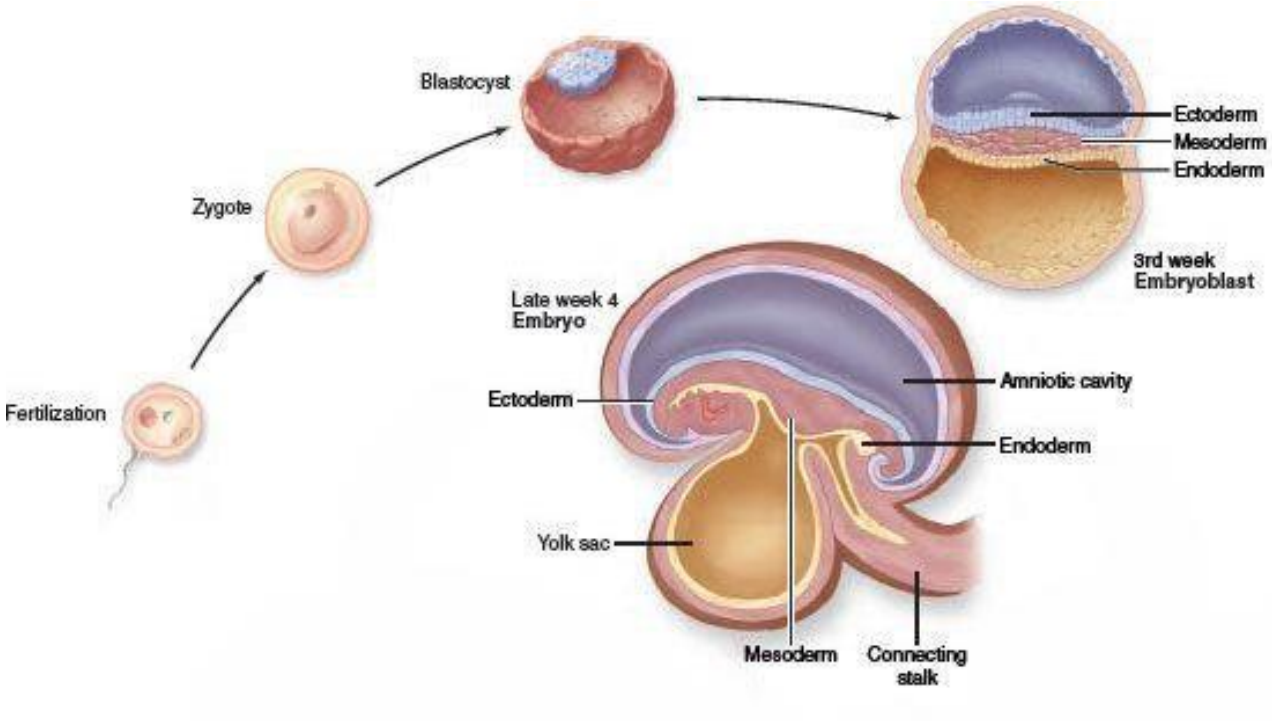
[60] EHD, The Endowment For Human Development, Prenatal Form and Function. (Last Consultation: 02 June 2025)

[61] Michigan Department of Health and Human Services, Health & Human Services. (Last consultation 01 June 2025): https://www.michigan.gov/mdhhs/adult-child-serv/informedconsent/michigans-informed-consent-for-abortion-law/procedures/fetaldevelopment/fetal-development-week-4?_

After the 8th week, the developing baby is referred to as a foetus, and the emphasis of development changes from forming organs to growing and maturing.

The foetal stage is marked by substantial growth and the fine-tuning of the systems that were established during the embryonic stage.

By the 9th week, the major organs are mostly developed, and the foetus starts to grow quickly. The limbs lengthen, and the bones begin to harden, allowing for movements that are more intricate. The sensory organs, such as the eyes, ears, and taste buds, start to work, and by the second trimester, the fetus can react to various stimuli.




*Picture 15 Gastrulation. Source: Indra Hartando, Introduction Tissues, Four types of tissues (Reproduction).*

In the final weeks, the foetus builds up fat, which aids in regulating body temperature after birth. The skin becomes thicker and less transparent. By the 40th week, the foetus is fully developed, prepared for birth, and positioned head-down in the uterus.

At the end of the 9th month (around 40 weeks), the foetus makes the transition from the uterus to the outside world. Labour begins, leading to the expulsion of the foetus from the

uterus. After birth, the new-born's organs, particularly the lungs, keep maturing and adjusting to life outside the womb.

The entire gestation process is characterised by three main stages: the first trimester, the second trimester, and the third trimester. Each stage is marked by unique changes and milestones, including the growth of organs, the development of physical features, and the establishment of essential systems needed for life outside the womb.

During the first trimester, the embryo experiences essential growth and changes. It is also critical for the formation of the placenta, which is a crucial organ that supplies oxygen and nutrients to the developing foetus while also eliminating waste products.[62]

By the 5th week, the neural tube develops, which will eventually form the brain and spinal cord. The heart starts to beat around the 6th week, although it remains a basic tube-like structure. By the 8th week, the embryo is officially referred to as a fetus, and recognizable features such as arms, legs, and facial characteristics start to develop. While these features are still basic at this stage, the groundwork for all major organs, including the brain, heart, kidneys, and liver, is being laid down.

The second trimester is characterized by significant growth and development. During this time, the foetus starts to take on a more human-like appearance. By the 14th week, distinct facial features such as eyes, ears, and a nose have formed. The limbs are fully developed, and the foetus begins to move, although the mother may not yet feel these movements. A key development during the second trimester is the maturation of the nervous system. By the 20th week, the foetus's brain has progressed sufficiently to enable reflexive movements like sucking and swallowing. Additionally, the foetus can react to external stimuli, such as sounds and light, even though its eyes remain closed.

The third trimester marks the last stage of foetal development, characterized by ongoing growth and preparation for delivery.

[62] Cleveland Clinic, Placenta. What does the placenta do? (Last consultation 02 May 2025): https://my.clevelandclinic.org/health/body/22337-placenta?

At the start of this trimester, the foetus measures approximately 14 inches and weighs between 2 to 3 pounds. In the following weeks, the foetus continues to gain weight, primarily through the accumulation of fat stores that assist in regulating body temperature after birth.

A major development during the third trimester is the maturation of the lungs. Before this period, the lungs are filled with fluid and cannot function outside the womb. Around 34 weeks, the lungs start producing surfactant, a substance that aids in proper lung inflation at birth. This is essential for the fetus's ability to breathe on its own after delivery. In this final stage, the foetus experiences crucial brain development. Neurons and synapses form quickly, leading to more advanced brain activity. By the 36$^{th}$ week, most foetuses are typically positioned head-down in readiness for birth, although some may still be in a breech position. As the fetus approaches full term (around 37 weeks), its organs are fully developed and functioning, although they keep maturing in the last few weeks. The fetus also gets antibodies from the mother, which helps provide protection after birth.

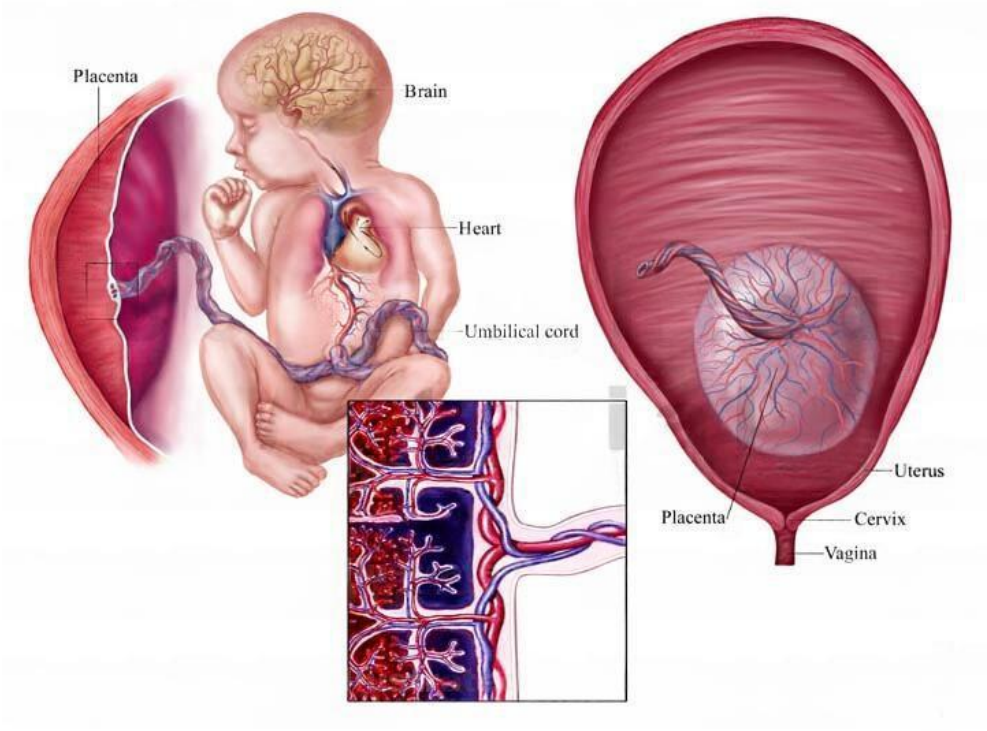
**The role of the placenta**

The placenta is an extraordinary and versatile organ that serves a vital function during pregnancy, enabling the transfer of nutrients, gases, and waste products between the mother and the growing foetus. It creates a crucial, albeit temporary, link between the two, allowing the foetus to obtain the vital resources needed for its growth and development, while also shielding it from harmful substances. The placenta begins to form soon after fertilization. Once the zygote transforms into a blastocyst and attaches to the uterine wall, the trophoblast begins the process of forming the placenta. The trophoblast cells penetrate the endometrium, forming a strong link with the mother's blood vessels. During the initial weeks of pregnancy, the placenta expands and matures into an operational organ, featuring specialized structures that enable the exchange of nutrients and waste.

The placenta consists of both maternal and foetal parts. The maternal side connects to the uterus and is formed by the decidua, which is a layer of altered endometrial tissue. The foetal side connects to the developing foetus through the umbilical cord and is lined with chorionic villi, which are finger-like projections containing blood vessels. The placenta is linked to the developing baby by a tube-like structure known as the umbilical cord. This cord allows the placenta to supply oxygen and nutrients to the growing baby.

These structures facilitate the exchange of oxygen and nutrients between the maternal and foetal circulatory systems. It plays a crucial role in various functions that are essential for both foetal development and maternal health throughout pregnancy.

For instance, the placenta serves as a vital conduit for oxygen and nutrients from the mother to the foetus. Oxygen from the mother's bloodstream diffuses through the placental membrane into the foetal blood, while carbon dioxide, a metabolic waste product, travels in the opposite direction to be exhaled by the mother. Nutrients like glucose, amino acids, fatty acids, vitamins, and minerals are transferred from the mother's blood to the foetus. These are crucial nutrients for the foetus’s rapid growth and development.




*Picture 16 Fetal circulation. Source: Illustrated Verdiet.*

In addition, the placenta plays a crucial role in eliminating waste products from the foetal blood, such as carbon dioxide and urea. These waste materials are transferred to the mother's bloodstream, where her kidneys process and excrete them.

The placental circulation is remarkably efficient, facilitating the exchange of gases, nutrients, and waste without the blood of the mother and foetus mixing. Although maternal and foetal blood vessels are in close proximity within the placenta, they do not directly intermingle. Instead, a thin membrane separates them, enabling the diffusion of substances

between the maternal and foetal circulations. The placenta functions as a filter, selectively permitting the passage of essential molecules while preventing potentially harmful substances from crossing.

Moreover, the placenta plays a crucial role in producing several key hormones that support pregnancy, including human chorionic gonadotropin (hCG). This hormone is essential for maintaining the corpus luteum, which produces progesterone during the early stages of pregnancy. Additionally, hCG is the hormone that pregnancy tests detect.

**The umbilical cord**

The umbilical cord is a crucial structure in fetal development, serving as the lifeline that connects the growing fetus to the placenta. This cord facilitates the exchange of essential nutrients, oxygen, and waste products between the mother and fetus during pregnancy. The primary role of the umbilical cord is to enable the transfer of oxygen and nutrients from the mother to the fetus. Oxygen-rich blood from the mother reaches the placenta, where it diffuses into the fetal blood through the umbilical vein. This oxygenated blood is then carried to the fetus's organs and tissues, supporting normal cellular function and growth. The umbilical arteries transport waste products, including carbon dioxide and urea, from the fetus back to the placenta. The placenta then transfers these waste products into the mother's bloodstream, where they are processed and removed through her lungs and kidneys. This effective system ensures that the fetus does not come into contact with its own metabolic waste, which could otherwise build up and lead to toxicity.

Additionally, nutrients such as glucose, amino acids, vitamins, and minerals are transported from the mother to the fetus through this same blood flow. Without the umbilical cord, the fetus would be unable to receive the vital resources necessary for growth and development, nor could it eliminate metabolic waste. Although it exists only temporarily, the umbilical cord plays an indispensable role in supporting fetal life.[63]

[63] Heil JR, Bordoni B. *Embryology, Umbilical Cord*. 2023 Apr 17. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan–. PMID: 32491422.

The umbilical cord links the foetus to the placenta, acting as the primary pathway for the exchange of nutrients, oxygen, and waste. At term, the cord usually measures around 45-55 cm in length and consists of three blood vessels: two arteries that transport deoxygenated blood from the foetus to the placenta, and one vein that carries oxygen-rich blood and nutrients from the placenta to the foetus.

The umbilical cord is surrounded by a jelly-like substance known as Wharton's jelly. This cushioning helps protect the blood vessels from being compressed, ensuring that blood and nutrients continue to flow to the foetus. This is crucial for fetal growth, supplying the fetus with the essential building blocks needed for development. Wharton's jelly, along with the amniotic fluid in the uterus, plays a crucial role in preventing excessive pressure on the cord, ensuring normal blood flow and reducing the likelihood of cord-related complications.

The umbilical cord also plays a vital role in transporting hormones from the placenta to the fetus. These hormones are essential for regulating fetal development, sustaining pregnancy, and preparing the foetus for birth. For instance, the placenta produces human chorionic gonadotropin (hCG), which supports the ongoing production of progesterone, helping to prevent premature labor and maintain a stable environment in the uterus.

Additionally, hormones like estrogen and progesterone are critical for the fetus's continued growth and the placenta's proper functioning. The umbilical cord is protected by a thin layer of cells known as the amnion, which is the same membrane that encases the foetus within the amniotic sac. The umbilical cord is essential for supporting and nurturing the fetus throughout its development.

Once the baby is born, the umbilical cord is cut, the blood vessels in the cord start to collapse and the remaining stump of the umbilical cord dries up and typically falls off within a few weeks. It ultimately leaves behind a remnant known as the umbilical scar or navel.

**Anatomy of the foetus and organogenesis**

Organogenesis is a sophisticated and well-orchestrated process that converts a mass of undifferentiated cells into a fully functional organism with specific organs. This process involves complex signaling and cellular differentiation, leading to the formation and functioning of organs like the brain, heart, limbs, digestive system, and kidneys. This process is essential not just for personal growth but also for the continuation of the species.[64]

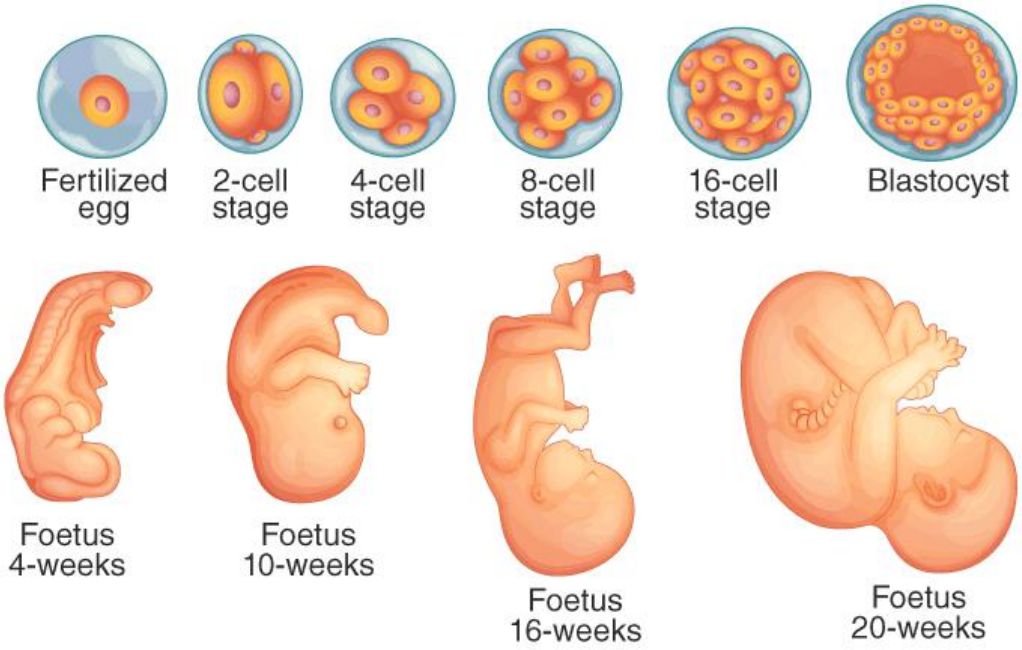
Any disturbances or changes in the genes or signaling pathways that play a role in organ development can result in congenital defects or developmental disorders, underscoring the significance of this stage in forming a healthy organism.

It is essential for the development of a fully functional organism, as it includes the specialization of cells and tissues into distinct organs that perform the physiological functions required for survival. The foetal body experiences significant transformations, evolving from a basic cluster of cells into a fully developed human being with intricate systems.[65]

The development of each organ system is a carefully orchestrated process, with structures starting to form early in pregnancy and continuing to mature as gestation advances. By the time of birth, the fetus has a fully functioning circulatory, respiratory, digestive, and nervous system, all essential for survival outside the womb. The anatomical development of the foetus is intricately connected to the stages of pregnancy, which can be divided into early, mid, and late stages of foetal growth.

[64] Lumen, Anatomy and Physiology II, Embryonic Development. (Last consultation 01 June 2025): https://courses.lumenlearning.com/odessa-ap2/chapter/embryonic-development/?_

[65] Science Direct. Bridget M. Nugent, Tracy L. Bale, The omniscient placenta: Metabolic and epigenetic regulation of fetal programming, Frontiers in Neuroendocrinology, Volume 39, 2015, ISSN 0091-3022 (Last Consultation: 29 May 2025): https://www.sciencedirect.com/science/article/abs/pii/S0091302215300042




*Picture 17 Embryo development. Source: Byjus, Embryo development.*

In the earliest stages of development, a foetus is called an embryo. The brain and spinal cord are some of the first structures to take shape. At first, the neural tube forms and slowly evolves into the forebrain, midbrain, and hindbrain. The forebrain ultimately develops into the cerebral hemispheres. By the conclusion of the third week, a basic heart tube is formed.

The heart starts beating by the sixth week, although it remains a simple, tube-shaped structure. The heart goes through a process of folding and division, creating the chambers that will eventually enable efficient circulation. By the 12th week, the heart is completely formed and starts pumping blood through a closed circulatory system. At this stage, the blood vessels in the foetus are fully developed.[66]

Around the 4th week, limb buds start to form. These small, flipper-like projections gradually grow into arms and legs, with fingers and toes developing by the 8th week. By the 5th week,

[66] Embryology Med, Cardiovascular System Development. (Last Consutation: 29 May 2025): https://embryology.med.unsw.edu.au/embryology/index.php?title=Cardiovascular_System_Development

the facial features start to take shape. The eyes, ears, and mouth emerge as small pits or ridges.

The fundamental outline of the face, including the nostrils, eyes, and lips, becomes recognizable, although it remains quite basic. At this point, it is challenging to differentiate between male and female genitalia. As the foetus moves into the second trimester, its anatomy starts to become more intricate and defined. The body begins to assume a more recognizable shape, with the organs further differentiating.

Afterwards, the brain undergoes significant growth, with the development of areas such as the cerebrum, cerebellum, and brainstem. The foetal nervous system becomes increasingly functional, allowing the foetus to display reflexive movements like sucking and grasping.

The digestive system starts to work around the 12$^{th}$ week of pregnancy, as the foetus begins to swallow amniotic fluid. During this period, the intestines grow quickly, and by the 20$^{th}$ week, the liver begins to produce bile while the pancreas starts to produce insulin.[67]

The development of the respiratory system also takes place at this stage. Although the lungs are not yet able to breathe air, they begin to develop the bronchial tree. The respiratory structures, such as the trachea and bronchi, take shape during the second trimester. Additionally, surfactant is produced, a substance that will later help with lung expansion.

By the 20$^{th}$ week, the foetus has developed a functioning musculoskeletal system, and movements become more apparent, though the mother may still find it challenging to feel them at this stage. The bones are continuing to harden, and muscle development is speeding up.

After 16 to 18 weeks, the genitals start to take shape. The external genitalia are fully developed, allowing for the determination of the foetus's sex via ultrasound. The testes or ovaries have formed, and the reproductive organs begin their maturation process.

[67] OER Services, Anatomy and Physiology II. (Last Consultation: 03 June 2025): https://courses.lumenlearning.com/suny-ap2/chapter/fetal-development/?utm

In the same line, we can begin to observe the formation of the skin. The skin of the foetus is thin and translucent at this stage it starts to thicken, developing a more defined skin structure.

A protective layer known as vernix caseosa begins to form, acting as a barrier against the amniotic fluid.[68] In the third trimester, the foetus experiences significant growth and further development of its anatomical structures. The body systems continue to mature in preparation for life outside the womb. For instance, the brain experiences its fastest growth in the last trimester. By the 28th week, it has developed enough to manage essential bodily functions, but it will keep maturing for several months after birth. At the same time, the nervous system continues to develop, and the foetus starts to exhibit more coordinated and intentional movements, including distinct patterns of waking and sleeping.

During the final stage of gestation, the foetus' immune system takes shape. While not fully developed, the foetal immune system begins to receive antibodies from the mother through the placenta in the final trimester, providing protection for the new-born during the initial months of life.

Bone and muscle mass keep growing. By the end of the third trimester, the foetus's bones are fully formed but still soft and flexible, which aids in the birthing process. At this stage, the muscles are now fully developed, allowing the foetus to perform coordinated movements like grasping and sucking.

At this point, the external traits are now outlined and clearly visible. The foetus's face becomes more distinct, the skin starts to lose its translucency, the eyes are now open, and the eyelashes, eyebrows, and hair keep growing.

[68] Healthline, Benefits of Vernix Caseosa during Pregnancy and Delivery. (Last Consultation: 29 May 2025): https://www.healthline.com/health/pregnancy/vernix-caseosa?utm

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| Amnio | Membrana a forma di sacco che avvolge il feto, e al cui interno vi è il liquido amniotico. | "[…] Le membrane fetali sono molto resistenti (l'***amnios***, la membrana più interna ha uno spessore di circa 0.1 mm ed è 6 volte più resistente del corion, spesso 0,4 mm) pertanto la PROM può essere dovuta a una fragilità intrinseca patologica o a fattori estrinseci." | Amnion | La review dell'ostetrica, l'evidenza che in-Forma, di Marie Chiofaló, ostetrica: https://lareviewdellostetrica.com/2017/06/27/rottura-prematura-delle-membrane-tprom-pprom-secondo-le-linee-guida-internazionali/<br><br>University of Rochester, Medical Center: https://www.urmc.rochester.edu/encyclopedia/content.aspx?contenttypeid=85&contentid=P01189 |

In Italian, it is also referred to as *amnios*. It derived from the Greek *ἀμνίον*, said of a 'vessel for collecting the blood of victims'.

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| Cordone ombelicale | Funicolo connettore tra la placenta materna e il feto. Apporta ossigeno e nutrimento al feto, eliminando i suoi prodotti di rifiuto. | "[…] Il ***cordone ombelicale*** non contiene nervi, di conseguenza la recisione non è dolorosa né per il bambino né per la madre." | Umbilical cord | Ospedale Pediatrico Bambino Gesù: https://www.ospedalebambinogesu.it/cordone-ombelicale-la-corretta-gestione-cosa-fare-e-cosa-non-fare--90424/#:~:text=Dopo%20qualche%20minuto%20viene%20bloccato,bambino%20n%C3%A9%20per%20la%20madre<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/body/umbilical-cord |

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| Corion | Annesso embrionale più esterno dell'uovo fecondato ricoperto di gemme epiteliali ramificate e vascolarizzate. È importante per la gli scambi gassosi e nutritivi fra il sangue dell'embrione e il sangue materno. | "[…] Il numero di ***corion*** dipende dal momento in cui è avvenuta la scissione dell'embrione: se la scissione avviene prima del quinto giorno dal concepimento, ogni gemello avrà il proprio corion (la membrana esterna), il proprio amnios (la membrana più interna) e la propria placenta (gemelli bicoriali o dicorionici e biamniotici)." | Chorion | ISS, Istituto Superiore di Sanità: https://www.iss.it/gemelli-faq/-/asset_publisher/YM555v3fB2jv/content/qual-%C3%A8-la-differenza-tra-gravidanza-gemellare-monocoriale-e-bicoriale-e-tra-gravidanza-monoamniotica-e-gravidanza-biamniotica-<br><br>TAU, Translational Andrology and Urology, J. Akerman, J. R. Kovac, 2017, *Amnion/chorion grafts and their applications in urology*: https://tau.amegroups.org/article/view/17357/17732 |

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| Liquido amniotico | Sostanza presente nella cavità amniotica che si origina in parte dal feto come escreto, in parte dai vasi del cordone ombelicale e dalla placenta come trasudato, in parte, infine, dall'attività della membrana amniotica come secreto. | "[…] Il ***liquido amniotico*** contiene cellule provenienti dal feto; motivo per cui tecniche diagnostiche come l'amniocentesi permettono di valutare la presenza di anomalie genetiche e cromosomiche nel feto, come la trisomia del cromosoma 21 o sindrome di Down." | Amniotic fluid | SIF, Società Italiana di Farmacologia: https://www.sifweb.org/sif-magazine/voci-di-supporto/liquido-amniotico<br><br>Icahn School of Medicine at Mount Sinai: https://www.mountsinai.org/health-library/special-topic/amniotic-fluid#:~:text=Amniotic%20fluid%20is%20a%20clear,%2C%20neurological%2C%20or%20other%20problem |

It is often called 'liquor' or 'waters'.

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| Parete uterina | Parte interna dell'utero formata da tre strati, dette anche tuniche: endometrio, miometrio e perimetrio. | "[…] A seconda della loro posizione rispetto alla ***parete uterina***, i miomi si distinguono in: sottomucosi (se sporgono all'interno della cavità uterina); intramurali (se si trovano nello spessore della parete uterina stessa); sottosierosi (se posizionati sulla parete uterina verso l'esterno); peduncolati (ovvero totalmente al di fuori del viscere uterino, connessi ad esso per mezzo di un peduncolo)." | Uterine wall | MP Salute Poliambulatorio: https://mpsalute.it/mioma-uterino-o-fibroma-dellutero-quando-preoccuparsi/<br><br>Mayo Clinic: https://www.mayoclinic.org/diseasesconditions/uterinepolyps/symptomscauses/syc-20378709 |

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| Placenta | Annesso fetale deputato agli scambi metabolici tra madre e il feto. | "[…] Tramite contrazioni meno intense rispetto a quelle del travaglio, i cotiledoni, ossia i vasi sanguigni che tengono la ***placenta*** ancorata all'utero, si staccano dalle pareti dello stesso." | Placenta | Dottor Silva: https://dr-silva.com/blogs/notizie/placenta?srsltid=AfmBOorceGtU9BReOoSdBkZ36nPAoH4uRw2XEAcHW301zwMnaEcm-QMO<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/body/22337-placenta |

It derives its etymology from the Greek *πλακοῦς -οῦντος*, meaning 'having a flattened shape'.

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| Spazio intervilloso | Lacuna membranosa di separazione contenente una massa di villi interconnessi irrorati da sangue materno. In essa avvengono gli scambi fetali di sostanze tra l'embrione e il sangue. | "[…] La sostanza fibrinoide: è un materiale acellulare, omogeneo, che deriva dalla secrezione o dalla degenerazione cellulare. In parte può essere costituito da fibrina. Si trova soprattutto nella regione subcoriale e nello ***spazio intervilloso***, intravilloso, nei setti placentari, nel piatto basale (il lato materno della placenta, a contatto con l'utero)", nelle membrane fetali e nei vasi uteroplacentari." | Intervillous space | Medicina maternofetale, Dott.ssa Valentina Pontello, Ginecologa: https://www.medicinamaternofetale.it/medicina-materna/placenta/esame-istologico-placentare/aspetti-microscopici<br><br>Human Embryology, Embryogenesis: https://embryology.ch/en/embryogenese/fetal-membranes-and-placenta/placental-blood-circulation/ |

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| Tessuto trofoblastico fetale | Tessuto di origine embrionale che costituisce la parte principale della placenta e ha il compito di permettere l'impianto dell'embrione nell'endometrio materno e di mediare gli scambi tra madre e feto. | "La malattia trofoblastica gestazionale è la proliferazione di ***tessuto trofoblastico fetale*** nella donna in gravidanza o da poco gravida. I sintomi possono comprendere un eccessivo ingrossamento dell'utero, vomito, sanguinamento vaginale e preeclampsia, che di solito si manifestano all'inizio della gravidanza." | Fetal trophoblastic tissue | Manuale MSD, Versione per i professionisti: https://www.msdmanuals.com/it/professionale/ginecologia-e-ostetricia/tumori-ginecologici/malattia-trofoblastica-gestazionale<br><br>Johns Hopkins Medicine: https://www.hopkinsmedicine.org/health/conditions-and-diseases/gestational-trophoblastic-disease#:~:text=The%20trophoblast%20helps%20the%20embryo,nutrients%20to%20a%20developing%20fetus. |
| Tubo neurale | Solco che si converte in tubo durante lo sviluppo del feto. Racchiude nel suo sviluppo cervello e midollo spinale. | "[…] In Italia, i difetti del ***tubo neurale*** colpiscono circa 1 bambino ogni 1500 nuovi nati. I difetti del tubo neurale possono essere "aperti" o "chiusi", a seconda che ci sia un deficit o un eccesso di tessuti." | Neural tube | AURORA, Il test prenatale non invasivo: https://www.testprenataleaurora.it/it/blog/18-patologie/1303-difetti-del-tubo-neurale-cosa-sono-e-come-si-manifestano.html<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/diseases/22656-neural-tube-defects-ntd |

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| Villi coriali | Tessuto che costituisce la placenta e che è deputato all'assorbimento dell'ossigeno e dà nutrimento di sangue materno cedendo alla madre anidrite carbonica. | "[…] La villocentesi prevede il prelievo sotto guida ecografica dei ***villi coriali***, che rappresentano la parte più esterna della placenta. La metodica è completamente ambulatoriale e non prevede l'utilizzo di anestesia." | Chorionic villi | IRCCS, Fondazione Policlinico Universitario Agostino Gemelli, Università Cattolica del Sacro Cuore: https://privato.policlinicogemelli.it/approfondimenti/villocentesi/<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/diagnostics/4028-chorionic-villus-sampling-for-prenatal-diagnosis |

In scientifica texts this word is always used in plural, in the singular is: villus.

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| Zigote | Cellula diploide prodotta dalla fusione dei due gameti aploidi, quello maschile e quello femminile. | "[…] I gemelli siamesi sono una coppia di gemelli monozigoti, vale a dire gemelli identici che provengono dallo stesso ***zigote***, che nascono uniti fisicamente e che spesso condividono anche alcuni organi." | Zygote | Ospedale Pediatrico Bambino Gesù: https://www.ospedalebambinogesu.it/gemelli-siamesi-89720/<br><br>Mayo Clinic: https://www.mayoclinic.org/healthy-lifestyle/pregnancy-week-by-week/multimedia/fertilization-and-implantation/img-20008656 |

It derives its etymology from the Greek *ζυγωτός* 'harnessed'.

# Sviluppo del feto:
# Fasi

# Foetus development:
# Stages

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| Blastocisti | Stadio di sviluppo dell'embrione che inizia dal momento del concepimento, dopo 5 giorni. | "[…] Gli embrioni possono essere trasferiti nella cavità uterina 2-3 giorni dopo la fecondazione o allo stadio più avanzato di ***blastocisti***." | Blastocyst | Raprui, Centro di Fecondazione Assistita a Roma: https://raprui.com/news/blastocisti-cosa-sono/<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/body/22889-blastocyst |
| Embriogenesi | Fusione di due gameti e materiale genetico proveniente dai genitori in seguito alla fecondazione. | "[…] Ripercorrendo a ritroso le tappe dell'***embriogenesi*** (cioè dello sviluppo del bambino durante la vita prenatale) risulta sorprendentemente chiara la corrispondenza tra formazioni così diverse negli organismi adulti, ma che sono derivate da un "progetto" , un abbozzo che fino al secondo mese di vita intrauterina prevedeva entrambe le possibilità." | Embryogenesis | AIED, Associazione Italiana per l'Educazione Demografica: https://www.aied.it/differenziazione-sessuale-dellembrione/<br><br>Oregon State University: https://open.oregonstate.education/aandp/chapter/28-2-embryonic-development/ |

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| Fecondazione | Incontro tra lo spermatozoo e la cellula uovo, ovocita. Dunque unione tra gamete maschile e femminile. | "[…] La ***fecondazione*** si verifica in genere quando l'ovocita si trova nella tuba di Falloppio." | Fertilization | Manuale MSD, Versione per i professionisti: https://www.msdmanuals.com/it/professionale/ginecologia-e-ostetricia/approccio-alla-donna-in-gravidanza-e-assistenza-prenatale/fecondazione-e-sviluppo-dell-embrione<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/articles/11585-conception |

This word derives from the ancient Greek *ἔμβρυον* meaning 'embryo' and genesis *γίγνομαι* meaning 'to be born'.

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| Gastrulazione | Processo di sviluppo caratterizzato da movimenti cellulari attraverso cui si formano i tre strati germinativi principali dell'embrione, l'ectoderma, il mesoderma e l'endoderma. | "[…] È stato inoltre ipotizzato che alcune cellule dell'epiblasto possano persistere oltre l'inizio della ***gastrulazione*** e permanere in uno stato ESC-simile." | Gastrulation | SIRU, Società Italiana per la Riproduzione Umana: http://www.sidr.it/cms/view/repronews/elenco_numeri/11_2_luglio_2009/elenco_news/le_cellule_staminali_dalla_ricerca_all_applicazione_clinica/s6528/c22507.html<br><br>CD, Creative Diagnostics: https://www.creative-diagnostics.com/gastrulation-and-germ-layer-formation.htm |

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| Impianto | Annidamento di un ovulo fecondato nella membrana uterina. È la fase in cui l'embrione di fonde nell'endometrio. | "[…] Al momento dell'***impianto***, lo zigote è divenuto una blastocisti, che è uno strato di cellule che circonda una cavità. La parete della blastocisti ha un singolo strato di cellule eccetto il polo embrionale, formato da 3 o 4 strati di cellule." | Implantation | Manuale MSD, Versione per i professionisti: https://www.msdmanuals.com/it/professionale/ginecologia-e-ostetricia/approccio-alla-donna-in-gravidanza-e-assistenza-prenatale/fecondazione-e-sviluppo-dell-embrione<br><br>Mayo Clinic: https://www.mayoclinic.org/healthy-lifestyle/pregnancy-week-by-week/multimedia/fertilization-and-implantation/img-20008656 |

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| Organogenesi | Processo di differenziamento, formazione e sviluppo degli organi come cuore, stomaco e apparato sensoriale dopo 5 settimane di gravidanza. | "[…] Lo sviluppo polmonare nel feto progredisce attraverso fasi di ***organogenesi*** e differenziazione. Intorno alla 25ª settimana sono presenti alveoli abbastanza ben sviluppati e pneumociti di tipo II che producono surfattante e continuano a maturare durante la gestazione." | Organogenesis | Manuale MSD, Versione per i professionisti: https://www.msdmanuals.com/it/professionale/pediatria/fisiologia-perinatale/fisiologia-perinatale#Funzione-immunologica-neonatale_v77994328_it<br><br>University of Virginia, School of Medicine, Department of Cell Biology: https://med.virginia.edu/cell-biology/our-research/morphogenesis-and-organogenesis/ |
| Segmentazione | Prima fase dello sviluppo embrionale caratterizzata da una serie di successive divisioni dell'uovo fecondato in blastomeri. | "[…] La scelta dell'embrione da trasferire in utero avveniva solo attraverso una valutazione morfologica, e cioè considerando l'aspetto esteriore, la simmetria delle singole cellule che lo compongono, la velocità di moltiplicazione delle stesse (o ***segmentazione***) e la presenza di impurità nel suo contesto." | Segmentation | Prof. Antonio Palagiano, Esperto in fertilità e ginecologia: https://ginecologopalagiano.com/diagnosi-genetica-pre-impianto/<br><br>The Francis Crick Institute, B.K. Liao, D.J. Jörg and A.C Oates, 2016, *Faster embryonic segmentation through elevated Delta-Notch signaling*: https://www.nature.com/articles/ncomms11861 |

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| Somitogenesi | Processo di formazione dei somiti, strutture segmentate che si formano durante lo sviluppo embrionale. | "[…] I tre tessuti hanno una stessa derivazione embriologica, sviluppandosi dallo strato germinale mesodermico, che può essere suddiviso in tre regioni fondamentali: mesoderma parassiale, intermedio e laterale. La ***somitogenesi*** è un passaggio fondamentale che avviene nel mesoderma parassiale dove le cellule si dividono in somiti." | Somitogenesis | Pacini Editore Medicina, MFS, Medicina, Famiglia & Specialistica: https://www.pacinimedicina.it/medicina_famiglia/ipovitaminosi-d-e-osteosarcopenia/<br><br>ASU, Arizona State University, Embryo Project Encyclopedia: https://embryo.asu.edu/pages/role-notch-signaling-pathway-somitogenesis |
| Sviluppo fetale | Periodo di sviluppo del feto all'interno dell'utero da 12 settimane sino alla fine della vita intrauterina. | "[…] Due considerazioni importanti includono qual è l'evidenza scientifica sul ruolo nocivo di questi inquinanti per il sistema endocrino umano, soprattutto per l'organismo in via di sviluppo e se esiste un rapporto tra l'esposizione in utero e alterazioni nello ***sviluppo fetale*** con danni permanenti sul neonato." | Fetal development | ISS, Istituto Superiore di Sanità: https://www.epicentro.iss.it/ben/2008/settembre/2<br><br>Cleveland Clinic: https://my.clevelandclinic.org/health/articles/7247-fetal-development-stages-of-growth |

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| Sviluppo prenatale | Processo biologico che si divide in due fasi: la prima è l'embriogenesi e la seconda è lo sviluppo fetale. | "[…] L'obiettivo principale è promuovere lo stato di salute della futura mamma per diminuire i rischi di avere un bambino con un qualche disturbo dello ***sviluppo prenatale***." | Prenatal development | Etruria Medical Center, Gravidanza e consulenze ginecologiche: https://etruriamedical.it/trattamenti/in-gravidanza/<br><br>PSI CHI, International Honor Society in Psychology: https://www.psichi.org/blogpost/987366/502036/Prenatal-Development-Portrayed-in-the-Movie-Baby-Mama |

# CAPITOLO 3

## The Role of Linguists in the Medical Field

### 1. Reflection on Methodological Approach and Collaboration

The methodological approach undertaken in this research was both systematic and explorative. Starting with academic research and terminology consultation by experts and professional associations provided a solid basis for the identification and organisation of concepts, as well as an understanding of the principles of clarity, consistency and standardisation that underpin modern terminology science.

This approach helped to define the scope and categories of terms to be included and guided decisions on the structure of the bilingual sheet.

However, the later stages that laid the real foundations of this thesis, in particular the practical work of selecting terms from real texts and the collaborative consultation with an Italian-speaking midwife based in the UK. Her contribution underlined a central insight of this thesis: terminology work cannot be separated from the reality of practice. It has provided corrections, challenged assumptions and opened up new ways of thinking about the meaning of terms in real use, especially in contexts where emotional care and medical precision must coexist.

This collaboration also helped expose a key dichotomy in terminology work: the gap between theory and lived experience.

Thus, while many terminology sources offer rigid definitions of stages of childbirth or medical procedures, the midwife's reflections illustrated how these terms are often used flexibly, responding to patients' needs, for example in the case of ‘Amniotic fluid’ that is

commonly called ‘liquor’, word that could be considered simple but at the same time fitting. This convergence of theory and practice was one of the most rewarding aspects of the research and shaped the final structure and content of the terminology resource. Such a level of knowledge could hardly be achieved without the contribution of an expert in the field.

## 2. Intersections between Terminology and Terminography

Throughout this dissertation, a common thread of comparison was the relationship between terminology, as a conceptual and system-oriented discipline, and terminography, as a more applied and user-centred activity. This distinction is often presented in two views: terminology theorises, while terminography documents; one is abstract, the other practical. However, It is believed that this division may oversimplify what is, in reality, a highly interdependent relationship. Rather, one must consider both as a single instrument inseparable from each other. Regarding the terminology collected in this work, it was a very complex process mainly because of the subject covered.

The field of childbirth has proved particularly rich and complex for terminological analysis. It is a space where technical procedures intersect with human experiences, where communication takes place not only between professionals, but also between practitioners and patients, often in moments of vulnerability and strong emotion. This makes terminology work in this field particularly challenging, as it must meet not only the demands of accuracy, but also ethical considerations, empathy and clarity.

Several difficulties emerged during the creation of the terminology sheet. Firstly, it became clear that the terminology related to childbirth is densely layered, often involving a mixture of formal medical language (e.g. 'rupture of membranes'), euphemistic or colloquial terms (e.g. 'water breaking' or in Italian *Rottura delle acque*). This is necessary, as mentioned above, to facilitate communication with patients. Similarly, the typical difficulties encountered with English-speakers, i.e. the use of acronyms rather than the extended form (e.g AFA, 'Amniotic Fluid Embolism'). Here it diverges from Italian in which the extended form is necessary (e.g. *Embolia di liquido amniotico*).

Secondly, the linguistic asymmetry between English and Italian sometimes required more than one Italian equivalent for a single English term. An example would be 'Gestational hypertension', which in Italian is called in two ways: *Ipertensione gravidica* or *Ipertensione gestazionale*.

Thirdly, it emerged that some terms have a very strong connection with the Latin idiom, making them very institutional and not very accessible, and this is especially the case in English. A prime example is the Italian word *Iperemesi gravidica*, which finds its English equivalent as *Hyperemesis gravidarum*. In English grammar, a postpositive adjective is one that directly follows the noun it modifies, rather than preceding it as is typical; this syntactic placement is characteristic of certain special languages.[69]

However, these difficulties were overcome thanks to the assistance of experts in the field. The bilingual midwife's feedback was instrumental in understanding these nuances of language. Her clinical perspective allowed the resource to reflect both conceptual soundness and practical relevance, ensuring that the terminology could serve not only as a linguistic tool, but also as a resource for those engaged in bilingual health care translation, training or communication.

[69] Cambridge Dictionary, Teaching Postpositive Adjectives: https://www.cambridge.org/elt/blog/2020/07/14/teaching-postpositive-adjectives/

## 3. The Role of Language Professionals in Medical Settings

One of the broader reflections triggered by this project concerns the role of the interpreter or translator in the medical field, particularly in bilingual or multilingual contexts. Translators, interpreters and terminologists are often expected to be neutral channels of information, accurately reproducing the technical content of medical language.

Nonetheless, this project suggests that their role is much more complex and active.

During my stage as a language mediator in a hospital, I acted as a mediator between two people who did not speak the same language, often also between doctors who came from different countries.

Of course, the types of conversations matter and the language varies according to the technicality of the discourse. Not only in the field of obstetrics and gynaecology, but in all other medical disciplines as one can easily imagine.

In compiling and editing terminology, language professionals engage in acts of knowledge mediation, deciding not only how terms are translated, but also how they are expressed, contextualised and understood.

This involves cultural competence, ethical awareness and often a collaborative mind-set, especially when working alongside experts in the field. The partnership with the midwife exemplifies how such collaboration can improve the quality and usability of terminology resources and underlines the value of involving professionals with both linguistic and clinical backgrounds in the creation of specialised resources.

Furthermore, the act of working with terminology encourages a critical attitude towards the way knowledge is encoded in vocabulary.

One wonders how a term, or rather a concept, is best expressed. Every term carries an emotional and not merely terminological or technical load.

For example, the term ‘Uterine inversion’[70] certainly has a very serious connotation and does not bode well. These are not merely linguistic concerns, but deeply social and professional ones.

[70] Serious obstetric emergency where the uterus turns inside out, usually occurring during or shortly after childbirth. MSD Manual, Professional Version (Last Consultation 01 June 2025): https://www.msdmanuals.com/professional/gynecology-and-obstetrics/intrapartum-complications/uterine-inversion

## 4. Opportunities for Future Research

Like any terminographic project, this dissertation has its limits. The terminology sheet produced is comprehensive and the selection of terms reflects both the practical constraints of the research, and the specific areas explored through this collaboration. Yet it would have been interesting and beneficial if other adjacent topics such as breastfeeding, neonatal care or reproductive rights had been covered. We are certainly satisfied with what has been achieved so far, but this should not be a finishing line, but rather a starting point to further expand one's knowledge. Besides, an interpreter must not only know the language, which is an extensive effort, but must above all acquire high-level knowledge in the field in which they work if they want their performance to be optimal and meet the needs of their interlocutors.

Furthermore, while the focus on the bilingualism of the obstetrician with whom a fruitful collaboration was established, it also introduced some challenges. Not all concepts had clear or equivalent terms in both languages, and some required descriptive paraphrasing or the inclusion of usage notes.

An example would be 'Suspensory ligament',[71] which in Italian is expressed in different ways: *Legamento sospensore* or *Lombo ovarico* or *Infundibolo pelvico.*

This shows and highlights the ongoing challenge of working across language and health systems.

[71] Fibrous membrane that supports and suspends an organ or body part, particularly the ovary and uterus. Teach me Anatomy. (last consultation 01 June 2025): https://teachmeanatomy.info/pelvis/female-reproductive-tract/ligaments/

In terms of future research, there is the possibility of developing this project into a broader multilingual and multidimensional resource, ideally incorporating the contributions of multiple obstetricians, gynaecologists and language professionals in different contexts. The integration of digital tools, such as term extraction from the corpus or AI-assisted translation analysis, could also enrich the terminology analysis and broaden its scope.

# Conclusion

## Aims and Context of the Study

This dissertation proposes to explore the complex and multifaceted nature of specialized medical language, particularly through the lens of terminology and terminography. The goal is to examine how these two perspectives interact with each other and what role they play in shaping knowledge, communication and accessibility in the medical field. At the heart of this study there is a practical project: the creation of a bilingual terminology resource on childbirth, developed in collaboration with a practicing obstetrician who is fluent in both languages. This approach was essential to gain insight into the context and to be able to ask questions or elucidate first-hand.

Although initially motivated by a purely linguistic interest in the medical sector, the project quickly evolved into something deeper. It became clear that working with terminology in such a sensitive and high-risk field entails not only technical accuracy, but also ethical, cultural and communicative responsibility. The terms reflect professional ideologies, institutional structures, patients' experiences and the cultural contexts in which health treatment is provided. Language professionals working in this field therefore face not only linguistic challenges, but also interpersonal and inter-professional complexities.

Regardless of the medical discipline, terminology research and the subsequent classification of terms is a very important part that must not only be accompanied by bibliographic sources that everyone can access, but in order to be of broad relevance must be subjected to the attention of a physician specialised in that particular area of study.

**Final Thoughts: Language as a Bridge in Medical Care**

Ultimately, the work of this thesis made us realise that language is not simply a tool for conveying medical facts, but a vital component of the way care is delivered, experienced and understood. In the context of childbirth - a medically significant and deeply personal moment - terminology shapes not only the way doctors document and plan, but also the way they communicate, support and relate to the people entrusted to them. By combining documentation terminology and then professional collaboration, this project offered a contribution to professionalism as it manifested itself as a practical resource that was useful during my stage. It is a small example of what can be achieved when language professionals enter the medical domains not only as translators of words, but as mediators of meaning, culture and care.

Today, we can affirm that interpreters play a key role in the medical field, facilitating accurate communication. Their presence ensures that patients can clearly express their symptoms, understand diagnoses and follow treatment instructions, which is essential for safe and effective care. Medical interpreters also support informed consent by ensuring that patients fully understand medical procedures and their risks. Beyond language translation, interpreters often deal with the cultural nuances that influence healthcare beliefs and practices, helping to build trust between patients and healthcare professionals. Their contribution is crucial in promoting equity, patient safety and high quality care in increasingly diverse healthcare settings.

We conclude this dissertation with the hope that our work has not been done in vain, but rather that it will become a tool for navigating the complex world of obstetrics and gynaecology.

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## Sitografia


AGUI, Associazione Ginecologi Universitari Italiani, (Ultima Consultazione: 12/02/2025): https://aguionline.it/

AIED, Associazione Italiana per l'Educazione Demografica, (Ultima Consultazione: 01/02/2025): https://www.aied.it/

AIO, Associazione Italiana di Ostetricia, (Ultima Consultazione: 01/02/2025): https://associazioneitalianaostetricia.it/

AOGOI, Associazione Ostetrici Ginecologi Ospedalieri Italiani, (Ultima Consultazione: 05/07/2024): https://www.aogoi.it/

AOR, Azienda Ospedaliera Regionale, Ospedale San Carlo. Ospedale di Potenza inserito tra i migliori cento d'Italia, (Ultima Consultazione: 30/09/2024): https://www.ospedalesancarlo.it/

Artemisia Lab, Rete di centri clinici diagnostici. Assistenza medica convenzionata, (Ultima Consultazione: 30/09/2024): https://artemisialab.it/

ASST, Grande Ospedale Metropolitano Niguarda, (Ultima Consultazione: 30/08/2024): https://www.ospedaleniguarda.it/

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Centro Medico Buonarotti, Direttore Sanitario – Dott.sa Guia Carminati, Centro Medico Polispecialistico con sede a Milano, (Ultima Consultazione: 15/03/2025): https://www.centromedicobuonarroti.it/

Centro Medico Sempione, Gruppo Demetra Lifecare, Centro Medico specializzato in ginecologia con sede a Milano, (Ultima Consultazione: 15/05/2025): https://www.centromedicosempione.it/

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Danni da Parto.Legal, Studio Legale Stefano Gallo, Studio Legale con sede a Roma specializzato in mala sanità da parto, (Ultima Consultazione: 13/04/2025): https://www.dannidaparto.legal/

Dott. Luigi Cetta, Infertilità e Management della gravidanza, (Ultima Consultazione: 01/03/2025): https://www.luigicettaginecologo.it/

Dottor. Marco Zoccatelli, Studio Medico, Studio Medico Ostetrico e Ginecologico con sede a Busnago (MB), (Ultima Consultazione: 01/03/2025): http://www.ildottorzoccatelli.it/

Dott.ssa Chiara Riviello, Ginecologia e Ostetricia – Medicina Legale, Specialista in Ostetricia e Ginecologia a Milano e Firenze, (Ultima Consultazione: 06/03/2025): https://www.chiarariviello.it/

Dott.ssa Cristina Passadore, Medico chirurgo specializzato in Ginecologia e Ostetricia, perfezionata in Omeopatia e Omotossicologia, (Ultima Consultazione: 09/03/2025): https://www.cristinapassadore.it/

Dott. Massimiliano Pellicano, Ginecologia, Laparoscopia, Endometriosi, Infertilità di coppia, (Ultima Consultazione: 06/05/2025): https://www.massimilianopellicano.it/

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FIR, Fondazione Italiana del Rene, (Ultima Consultazione: 02/05/2025): https://www.fondazioneitalianadelrene.org/

FISM, Federazione delle Società Medico - Scientifiche Italiane, (Ultima Consultazione: 06/06/2025): https://fism.it/

FNOMCeO, Federazione Nazionale degli Ordini Medici Chirurgici e degli Odontoiatri, (Ultima Consultazione: 05/05/2025): https://portale.fnomceo.it/

FNOPO, Federazione Nazionale degli Ordini della Professione di Ostetrica, (Ultima Consultazione: 04/10/2024): https://www.fnopo.aon.it/home

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IRCCS, Università Cattolica del Sacro Cuore, Fondazione Policlinico Universitario Agostino Gemelli, (Ultima Consultazione: 05/02/2025): https://privato.policlinicogemelli.it/

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SIAMS, Società Italiana di Andrologia e e Medicina della Sessualità, (Ultima Consultazione: 22/02/2025): https://www.siams.info/

SICPRE, Società Italiana di Chirurgia Plastica Ricostruttiva ed Estetica, sezione ginecologia ricostruttiva, (Ultima Consultazione: 19/04/2025): https://www.sicpre.it/

SIEOG, Società Italiana di Ecografia Ostetrica e Ginecologica e Metodologie Biofisiche, (Ultima Consultazione: 30/05/2025): https://www.sieog.it/

SIF, Società Italiana di Farmacologia, (Ultima Consultazione: 09/01/2025): https://www.sifweb.org/

SIFES, Società Italiana di Fertilità e Sterilità, (Ultima Consultazione: 08/01/2025): https://www.sifes.it/

Silvia Pedrielli, Ostetrica Specialista nella Riabilitazione del Pavimento Pelvico, (Ultima Consultazione: 19/02/2025): https://www.ostetricapedrielli.com/ostetrica.html

SIMPIOS, Società Italiana di Medicina Perinatale e Ostetrica Sperimentale, (Ultima Consultazione: 10/01/2025): https://www.simpios.eu/

SIN, Società Italiana Nefrologia, (Ultima Consultazione: 20/02/2025): https://sinitaly.org/

SIOG, Società Italiana di Oncologia Ginecologica, (Ultima Consultazione: 04/11/2024): https://www.siog.it/

SIRU, Società Italiana per la Riproduzione, (Ultima Consultazione: 19/01/2025): https://www.pmaumanizzata.com/

SLOG, Società Lombarda di Ostetricia e Ginecologia, (Ultima Consultazione: 09/04/2025): https://www.slog.org/chi-siamo/

SOD Clinica di Ostetricia e Ginecologia, Ospedali Riuniti Marche, (Ultima Consultazione: 29/05/2025): https://portale.ospedaliriuniti.marche.it/

Studio Ambrosini, Specialisti in Ginecologia e Ostetricia, (Ultima Consultazione: 05/06/2025): https://studioambrosini.org/

Studio Medico Landino, (Ultima Consultazione: 30/05/2025): https://www.studiomedicolandino.it/

Surtex Instruments, Sito di vendtia di strumenti chirurgici, (Ultima Consultazione: 29/01/2025): https://surtex-instruments.com/it/

SYRIO, Società Italiana di Scienze Ostetrico-Ginecologico-Neonatali, (Ultima Consultazione: 06/03/2025): https://www.syrio.org/

TEXA, Biomedical Technology, Sito di vendita per strumentazione diagnostic, (Ultima Consultazione: 05/02/2025): https://www.texabiomedicali.it/

UFP, Urologia Femminile Padovana, (Ultima Consultazione: 09/04/2025): https://www.urologiafemminilepadovana.it/

Unità Ginecologica Ostetrica, Centro di fecondazione assistita di 1°livello. Dott. Vito Pizzo, (Ultima Consultazione: 03/12/2024): https://www.ginecologiaostetriciapizzo.it/

Università degli Studi di Napoli, Federico II, (Ultima Consultazione: 15/02/2025): https://www.chirurgiafegatopancreas.unina.it/

Università di Verona, Dipartimento di Scienza Chirurgiche Odontostomatologiche e Materno-infantili, (Ultima Consultazione: 16/04/2025): https://www.dscomi.univr.it/

UPMC Italia, Sezione servizi di ginecologia, (Ultima Consultazione: 17/04/2025): https://upmc.it/it/servizi/ginecologia

## Sitography


AAOGF, American Association of Obstetricians and Gynecologists Foundation, (Last Consultation: 03/04/2025): https://www.aaogf.org/

ABOG, The American Board of Obstetrics and Gynecology, (Last Consultation: 13/02/2025): https://www.abog.org/

ACGME, Accreditation Council for Graduate Medical Education, (Last Consultation: 22/01/2025): https://www.acgme.org/

ACOG, American College of Obstetricians and Gynecologists, (Last Consultation: 16/03/2025): https://www.acog.org/

AGOS, American Gynecological & Obstetrical Society, (Last Consultation: 19/04/2025): https://www.agosonline.org/

ADLM, The American Association for Diagnostic and Laboratory Medicine, (Last Consultation: 29/03/2025): https://www.creative-diagnostics.com/adlm-2025.htm

AHRQ, Agency for Healthcare Research and Quality, (Last Consultation: 23/02/2025): https://www.ahrq.gov/

AJOG – MFM, American Journal of Obstetrics & Gynecology – Maternal-Fetal Medicine, (Last Consultation: 13/05/2025): https://www.ajogmfm.org/

American Pregnancy Association, (Last Consultation: 29/04/2025): https://americanpregnancy.org/

APGO, Association of Professors of Gynecology and Obstetrics, (Last Consultation: 12/12/2024): https://apgo.org/

ASU, Arizona State University, (Last Consultation: 13/12/2024): https://www.asu.edu/

Australian Government, Department of Health and Aged Care. Theraputic Goods Administration, (Last Consultation: 23/02/2025): https://www.tga.gov.au/

AWHONN, Association of Women's Health, Obstetric and Neonatal Nurses, (Last Consultation: 03/04/2025): https://www.awhonn.org/

BAGP, The British Association of Gynaecological Pathologists, (Last Consultation: 01/04/2025): https://www.thebagp.org/

Barnsley Hospital, NHS – National Health System, (Last Consultation: 17/11/2024): https://www.barnsleyhospital.nhs.uk/

Baylor College of Medicine, (Last Consultation: 30/09/2024): https://www.bcm.edu/

BCSC, Body Contouring Surgery Clinic, (Last Consultation: 22/04/2025): https://bodycontouringsurgery.com.au/

BGCS, British Gynaecological Cancer Society, (Last Consultation: 30/04/2025): https://www.bgcs.org.uk/

Boston University School of Medicine, Sexual Medicine, (Last Consultation: 13/02/2025): https://www.bumc.bu.edu/sexualmedicine/

Buckinghamshire Healthcare Trust, NHS – National Health System, (Last Consultation: 12/09/2024): https://www.buckshealthcare.nhs.uk/

BUSOG, The British Undergraduate Society of Obstetrics and Gynaecology, (Last Consultation: 03/09/2024): https://thebusog.org/

Canadian Cancer Society, (Last Consultation: 03/04/2025): https://cancer.ca/en/

CAOG - Central Association of Obstetricians and Gynecologists, (Last Consultation: 02/02/2025): https://caog.org/

CHOP, Children's Hospital of Philadelphia, (Last Consultation: 13/05/2025): https://www.chop.edu/

Cleveland Clinic, (Last Consultation: 23/05/2025): https://my.clevelandclinic.org/

CUCOG, The Council of University Chairs of Obstetrics and Gynecology, (Last Consultation: 11/04/2025): https://www.cucog.org/

Doctors Without Borders, (Last Consultation: 01/04/2025): https://msfwarehouse.ca/

Dr. Emeil Kamel, Obstetrician, Gynaecologist & Laparoscopic Surgeon, (Last Consultation: 14/02/2025): https://www.dremeilkamel.com.au/

Duke Obstetrics and Gynecology, Duke University School of Medicine, (Last Consultation: 30/04/2025): https://obgyn.duke.edu/

EBCOG, European Board & College of Obstetrics and Gynaecology, (Last Consultation: 31/05/2025): https://ebcog.eu/

ECSACOG, East, Central and Southern Africa – College of Obstetrics and Gynecology, (Last Consultation: 03/09/2024): https://ecsacog.org/

ESG, European Society of Gynecology, (Last Consultation: 13/10/2024): https://www.esgynecology.org/

ESHRE, European Society of Human Reproduction and Embryology, (Last Consultation: 20/04/2025): https://www.eshre.eu/

Etymonline, Online Etymology Dictionary, (Last Consultation: 23/01/2025): https://www.etymonline.com/

Fetal Membrane Society, (Last Consultation: 30/04/2025): https://www.fetalmembranesociety.org/

FIGO, International Federation of Gynecology and Obstetrics, (Last Consultation: 02/05/2025): https://www.figo.org/

Fondazione Poliambulanza, Istituto Ospedaliero No Profit, (Last Consultation: 13/10/2024): https://www.poliambulanza.it/

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GerMed USA, Seller of surgical instruments, (Last Consultation: 12/10/2024): https://www.germedusa.com/

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HealthDirect Australia, Government-funded, national virtual public health service (Last Consultation: 22/09/2024): https://www.healthdirect.gov.au/

IARC, International Agency for Research on Cancer, (Last Consultation: 22/03/2025): https://www.iarc.who.int/

Icahn School of Medicine at Mount Sinai, (Last Consultation: 02/10/2024): https://www.mountsinai.org/

IDSOG, Infectious Diseases Society for Obstetrics and Gynecology, (Last Consultation: 01/04/2025): https://www.idsog.org/

IGC, The International GynecologicSociety, (Last Consultation: 12/02/2025): https://igsociety.org/

IGCS, International Society of Gynecologic Cancer, (Last Consultation: 11/04/2025): https://igcs.org/

IRML, Illawara, Reproductive Medicine and Laparascopy, (Last Consultation: 20/01/2025): https://www.irml.com.au/

ISGE, International Society of Gynecological Endocrinology, (Last Consultation: 02/02/2025): https://www.isgesociety.com/

ISIDOG, International Society for Infectious Diseases in Obstetrics and Gynaecology, (Last Consultation: 30/03/2025): https://isidog.com/

ISUOG, International Society of Ultrasound in Obstetrics & Gynecology, (Last Consultation: 11/02/2025): https://www.isuog.org/

Johns Hopkins Medicine, (Last Consultation: 22/04/2025): https://www.hopkinsmedicine.org/

Mayo Clinic, (Last Consultation: 28/02/2025): https://www.mayoclinic.org/

NASPOG, North American Society for Psychosocial Obstetrics & Gynecology, (Last Consultation: 01/03/2025): https://www.naspog.org/

NCT, National Childbirth Trust, (Last Consultation: 23/01/2025): https://www.nct.org.uk/

NHS, National Health System, (Last Consultation: 22/02/2025): https://www.nhs.uk/

NHS, Nottingham University Hospitals, (Last Consultation: 12/12/2024): https://www.nuh.nhs.uk/

NITA Polyclinic & Diagnostic Center, (Last Consultation: 22/03/2025): https://www.nitapolyclinic.com.np/

NVA, National Vulvodynia Association, (Last Consultation: 11/02/2025): https://www.nva.org/

OGSS, Obstetrical & Gynaecological Society of Singapore, (Last Consultation: 13/04/2025): https://www.ogss.net/

Oregon State University, (Last Consultation: 01/04/2025): https://open.oregonstate.education/

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Preeclampsia Foundation, (Last Consultation: 13/02/2025): https://www.preeclampsia.org/

PRODS, The Residency Program Directors Section, (Last Consultation: 10/03/2025): https://www.apcprods.org/PRODS

PSI CHI, International Honor Society in Psychology, (Last Consultation: 11/03/2025): https://www.psichi.org/

QMSU, Queen Mary Student's Union, Obstetrics and Gynaecology Society, (Last Consultation: 10/10/2024): https://www.qmsu.org/groups/obstetricsandgynae/

RANZCOG, Royal Australian and New Zeland College of Obstetricians and Gynaecologists, (Last Consultation: 22/04/2025): https://ranzcog.edu.au/

RCOG, Royal College of Obstetricians & Gynaecologist, (Last Consultation: 02/04/2025): https://www.rcog.org.uk/

Royal College of Obstetricians & Gynecologists, (Last Consultation: 23/01/2025): https://www.rcog.org.uk/

RSM, The Royal Society of Medicine, Obstetrics & Gynaecology Section, (Last Consultation: 30/03/2025): https://www.rsm.ac.uk/sections/obstetrics-and-gynaecology-section/

SAAOG, South Atlantic Association of Obstetricians and Gynecologists, (Last Consultation: 11/02/2025): https://saaog.org/

SASGOG, The Society of Academic Specialists in General Obstetrics and Gynecology, (Last Consultation: 22/04/2025): https://sasgog.org/

SASOG, The South African Society of Obstetricians and Gynaecologists, (Last Consultation: 15/12/2024): https://sasog.co.za/

SGGG, Swiss Society for Gynaecology and Obstetrics, (Last Consultation: 11/02/2025): https://www.sggg.ch/

SGO, The Society of Gynecologic Oncology, (Last Consultation: 13/11/2024): https://www.sgo.org/

SGS, Society of Gynecologic Surgeons, (Last Consultation: 12/04/2025): https://www.sgsonline.org/

SNEE Wellbeing Support Service, Suffolk and North East Essex Maternity and Neonatal Services, (Last Consultation: 22/03/2025): https://sneewellbeing.org.uk/

SOAP, The Society for Obstetric Anesthesia and Perinatology, (Last Consultation: 01/02/2025): http://soap.org/

Society of OBGYN Hospitalists, (Last Consultation: 29/04/2025): https://societyofobgynhospitalists.org/

SOGC, The Society of Obstetricians and Gynaecologists of Canada, (Last Consultation: 09/09/2024): https://sogc.org/

SOMANZ, Society of Obstetric Medicine of Australia and New Zealand, (Last Consultation: 19/04/2025): https://somanz.org/

Somerset NHS Foundation Trust, (Last Consultation: 01/06/2025): https://www.somersetft.nhs.uk/

Spinning Babies, (Last Consultation: 12/04/2025): https://www.spinningbabies.com/

Stanford Medicine, Children's Health, (Last Consultation: 02/03/2025): https://www.stanfordchildrens.org/en.html

St. George Surgical Center, (Last Consultation: 03/03/2025): https://www.stgeorgesurgical.com/

Swiss AGO, Working group within the Swiss Society for Gynaecology and Obstetrics (Last Consultation: 22/02/2025): https://swissago.ch/

TGH, Tampa General Hospital, (Last Consultation: 03/02/2025): https://www.tgh.org/

TWC, The woman's Clinic, (Last Consultation: 13/04/2025): https://twc-ms.com/

UChicago Medicine, (Last Consultation: 03/09/2024): https://www.uchicagomedicine.org/

Unicat MSF, (Last Consultation: 13/43/2025): https://unicat.msf.org/

University of Michigan, (Last Consultation: 09/12/2024): https://mlabs.umich.edu/

University of Rochester, Medical Center, (Last Consultation: 13/02/2025): https://www.urmc.rochester.edu/

University of Virginia, School of Medicine, Department of Cell Biology, (Last Consultation: 03/11/2024): https://med.virginia.edu/

WHO, World Health Organization: https://www.who.int/

WK, Willis-Knighton Health System, (Last Consultation: 31/05/2025): https://www.wkhs.com/home

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*anche quando le onde erano alte e il vento soffiava forte.*