



RUHANI COLLEGE

OF HEALTH BUSINESS AND TECHNOLOGY

RU RMT 17 Endocrinology · Registered Massage Therapy Diploma Program · Ruhani College, Brampton, Ontario

Lecture 06 Student Handbook — Gonadal, Reproductive and Life-Stage Endocrinology, with Treatment Planning

Aligned to FOMTRAC Inter-Jurisdictional Practice Competencies (2016), CMTO Standards of Practice, and the Regulated Health Professions Act, 1991. Principal sources: Waugh & Grant (2018); Marieb & Hoehn (2019); Werner (2019); Osborne (2012); Mottola et al. (2018); Teede et al. (2018).

How to Use This Student Handbook

This lecture completes the course in two ways. It covers the gonadal and life-stage endocrinology that shapes a large proportion of the patients in any general practice, and it assembles everything from Lectures 01 to 05 into a single treatment-planning framework you can apply to any endocrine presentation, including ones you have not studied.

Pregnancy, menopause and the aging endocrine system are not specialist topics. They describe the physiological state of a substantial share of the people you will treat, and they generate the positioning, pressure and screening decisions you will make most often.

- Learn the HPG axis first; the reproductive cycle and its disorders follow from it.
- For pregnancy, learn the positioning and screening requirements as a protocol rather than as principles to reconstruct on the spot.
- For the capstone framework in Topic 11, learn the five steps in order and practise applying them to conditions from earlier lectures.

The final topic covers documentation, consent and scope. These are examined, and they are also what distinguishes a competent professional record from an inadequate one.

Learning Outcomes for This Lecture

- Describe the hypothalamic-pituitary-gonadal axis and the role of inhibin.
- Explain the LH surge as the principal endocrine example of positive feedback.
- Describe the ovarian and uterine events of the reproductive cycle.
- Recognize dysmenorrhea, premenstrual syndrome, endometriosis and polycystic ovary syndrome and their treatment implications.
- Describe testicular function, hypogonadism, and the tendon risks of anabolic steroid use.
- Describe the endocrinology of pregnancy and apply safe positioning and screening.
- Describe puberty, menopause and the aging endocrine system.
- Apply the five-step treatment planning framework to any endocrine presentation.
- Meet the documentation, consent and scope requirements of Ontario practice.

Topic 1 — The Hypothalamic-Pituitary-Gonadal Axis



RUHANI COLLEGE

OF HEALTH BUSINESS AND TECHNOLOGY

- The hypothalamus releases gonadotropin-releasing hormone in a pulsatile pattern. The pulsatility is essential: continuous GnRH exposure paradoxically suppresses the axis, which is the basis of certain drug treatments.
- GnRH stimulates the anterior pituitary to release follicle-stimulating hormone and luteinizing hormone.
- In the ovary, FSH stimulates follicular development and estrogen production, and LH triggers ovulation and supports the corpus luteum.
- In the testis, FSH supports spermatogenesis through the Sertoli cells, and LH stimulates testosterone production by the Leydig cells.
- The sex steroids feed back to inhibit both the hypothalamus and the pituitary.

Inhibin is produced by ovarian granulosa cells and testicular Sertoli cells and selectively suppresses FSH without affecting LH. This selective feedback allows the two gonadotropins to be regulated independently, which is what permits the distinct hormonal phases of the reproductive cycle.

The axis is sensitive to systemic state. Substantial weight loss, very low body fat, intensive endurance training, chronic illness and sustained physiological stress can suppress GnRH pulsatility and stop the cycle. This is functional hypothalamic suppression: a tertiary disorder, in which the gonads and pituitary are structurally normal. Its clinical significance for a massage therapist is that prolonged suppression produces estrogen deficiency and therefore reduced bone density in a young patient who would not otherwise be considered at risk.

Review Questions — Topic 1

1. Trace the hypothalamic-pituitary-gonadal axis and state the specific actions of FSH and LH in each sex.
2. Explain the role of inhibin and why selective feedback on FSH is useful.
3. Explain why GnRH must be released in pulses, and describe functional hypothalamic suppression and its relevance to manual therapy.

Topic 2 — The Reproductive Cycle and the LH Surge

The phases

- Menstrual phase, approximately days one to five — the functional layer of the endometrium is shed; a new cohort of follicles begins to develop under FSH; all ovarian hormones are low and FSH is beginning to rise.
- Proliferative or follicular phase, approximately days six to fourteen — one dominant follicle matures and secretes rising estrogen; the endometrium regenerates, thickens and becomes vascular; inhibin suppresses FSH.
- Ovulation, around day fourteen — the LH surge ruptures the mature follicle and releases the oocyte; the endometrium is at full thickness and cervical mucus becomes thin and elastic.
- Secretory or luteal phase, approximately days fifteen to twenty-eight — the corpus luteum forms and secretes progesterone with some estrogen and inhibin; endometrial glands secrete and the lining becomes receptive to implantation.
- If fertilization does not occur, the corpus luteum degenerates, progesterone and estrogen fall sharply, and hormone withdrawal causes the functional layer to be shed, beginning a new cycle.
- If fertilization occurs, the corpus luteum is maintained by human chorionic gonadotropin from the embryo, the endometrium is retained and implantation proceeds.



RUHANI COLLEGE

OF HEALTH BUSINESS AND TECHNOLOGY

The LH surge is the principal endocrine example of positive feedback. For most of the cycle estrogen inhibits gonadotropin release. In the late follicular phase, when estrogen has been sustained above a threshold concentration for a sufficient period, its effect on the pituitary reverses from inhibitory to stimulatory. Rising estrogen then drives rising LH, which drives further estrogen production, producing the surge. Ovulation terminates the loop, after which the corpus luteum secretes progesterone and negative feedback is restored.

Cycle length varies between individuals and between cycles. The luteal phase is the more consistent portion, at approximately fourteen days; variation in total cycle length arises mainly in the follicular phase.

Review Questions — Topic 2

4. Describe the four phases of the reproductive cycle with the ovarian and uterine events of each.
5. Explain the LH surge as an example of positive feedback, including what terminates the loop.
6. Explain what happens hormonally if fertilization occurs and how this differs from a non-conception cycle.

Topic 3 — Dysmenorrhea, Premenstrual Syndrome and Endometriosis

Dysmenorrhea is painful menstruation. Primary dysmenorrhea occurs without underlying pathology and results from prostaglandin-mediated uterine contraction and ischemia. Secondary dysmenorrhea results from an underlying condition such as endometriosis or fibroids and typically begins later in life or worsens over time.

- Massage therapy may reduce associated muscular tension in the abdomen, low back, hips and pelvic floor region, and general relaxation may reduce reported pain.
- Be explicit that treatment addresses associated muscular symptoms rather than the uterine cause.
- New, severe or progressively worsening menstrual pain, particularly beginning later in life, warrants medical assessment.

Premenstrual syndrome is a cluster of physical and mood symptoms in the luteal phase resolving with menstruation. Symptoms include breast tenderness, bloating, headache, fatigue, irritability and low mood. A severe form with predominantly mood symptoms is recognized separately and warrants medical assessment.

- Adjust pressure over tender breast tissue and the abdomen, and ask rather than assume.
- Reported reductions in tension and anxiety are legitimate treatment goals; hormonal correction is not.

Endometriosis is the presence of endometrial-like tissue outside the uterus, which responds to cyclical hormonal change and produces inflammation, adhesions and scarring.

- It commonly causes severe menstrual pain, chronic pelvic pain, pain with intercourse, pain with bowel movements or urination, and subfertility.
- Diagnosis is frequently delayed by many years, so patients often report having had their pain dismissed.
- Adhesions and chronic pain sensitization mean pressure tolerance may be low and highly variable between sessions.
- Take the reported pain seriously and at face value, adjust pressure carefully, and check in frequently.
- Treatment can address associated musculoskeletal pain and general tension; it cannot address the underlying lesions, and saying so honestly is more useful to the patient than an overstated claim.

Review Questions — Topic 3



RUHANI COLLEGE

OF HEALTH BUSINESS AND TECHNOLOGY

7. Distinguish primary from secondary dysmenorrhea and state what a massage therapist can and cannot offer.
8. Describe endometriosis and state four implications for treatment.
9. State two legitimate treatment goals for a patient with premenstrual symptoms and one claim you should not make.

Topic 4 — Polycystic Ovary Syndrome

Polycystic ovary syndrome is the most common endocrine disorder in people of reproductive age with ovaries.

Diagnosis rests on the presence of at least two of three features: irregular or absent ovulation; clinical or biochemical evidence of excess androgens; and polycystic ovarian morphology on ultrasound.

Features

- Irregular, infrequent or absent menstruation and reduced fertility.
- Excess androgen effects: hirsutism, acne and scalp hair thinning.
- Insulin resistance, present in a substantial proportion of patients regardless of body weight, with an increased risk of type 2 diabetes.
- Increased cardiovascular risk factors, including dyslipidemia and hypertension.
- Increased risk of gestational diabetes in pregnancy.
- Higher rates of anxiety and depression, which international guidance recommends screening for routinely.

Treatment planning

- Screen for diabetes as you would any patient at risk, and apply diabetes precautions if present.
- Screen for hypertension and adjust how quickly you bring the patient off the table.
- Massage does not treat PCOS and does not restore ovulation. Reported reductions in stress and musculoskeletal pain are legitimate outcomes.
- Discuss body hair, acne or weight only if the patient raises them, and follow their lead. These features are frequently a source of distress, and unsolicited comment is inappropriate.

International evidence-based guidance published in 2018 emphasizes that PCOS is a metabolic as well as a reproductive condition, and that anxiety and depression are substantially more common in this group. Both points shape how you approach these patients.

Review Questions — Topic 4

10. State the diagnostic basis of polycystic ovary syndrome and name five of its features.
11. Explain why PCOS is described as a metabolic condition as well as a reproductive one, and state what this means for your treatment planning.
12. State the correct approach to discussing hirsutism, acne or weight with a patient who has PCOS.

Topic 5 — Testicular Function, Hypogonadism and Anabolic Steroids



RUHANI COLLEGE

OF HEALTH BUSINESS AND TECHNOLOGY

Testosterone is produced by the Leydig cells under LH stimulation. It drives male secondary sexual characteristics, supports spermatogenesis alongside FSH, increases muscle and bone mass, maintains libido, and stimulates erythropoiesis. Production declines gradually with age, typically from around the fourth decade.

Hypogonadism

- Primary hypogonadism arises from testicular failure, so testosterone is low and LH and FSH are high.
- Secondary hypogonadism arises from pituitary or hypothalamic failure, so testosterone, LH and FSH are all low.
- Features include reduced muscle mass and strength, increased body fat, reduced bone density, reduced libido and erectile dysfunction, fatigue, low mood and reduced body hair.
- The finding of direct relevance to manual therapy is reduced bone density, which requires attention to pressure and joint mobilization.

Anabolic-androgenic steroid use

- Supraphysiological androgen doses increase muscle mass and strength more rapidly than tendon and ligament tensile strength adapts, so the muscle can generate forces the tendon is not prepared to transmit. Tendon rupture risk is increased, particularly at the pectoralis major, biceps and quadriceps tendons.
- Other effects include acne, hypertension, adverse lipid changes, mood disturbance and aggression, and suppression of the patient's own testosterone production with testicular atrophy.
- In users who stop, the suppressed axis may take an extended period to recover.
- Practical implications: avoid aggressive stretching and end-range loading; take any report of a sudden tearing or popping sensation seriously and refer; be aware that skin may be more prone to acne and infection; and note that hypertension may be present.

Approach this subject without judgement. A patient who discloses anabolic steroid use has given you clinically important information and should not be made to regret doing so; the information changes your treatment plan and is worth having.

Review Questions — Topic 5

13. State the actions of testosterone and distinguish primary from secondary hypogonadism.
14. Explain why anabolic steroid use increases tendon rupture risk and state four practical implications.
15. Describe the correct professional approach when a patient discloses anabolic steroid use.

Topic 6 — The Endocrinology of Pregnancy

The hormonal picture

- Human chorionic gonadotropin from the embryo maintains the corpus luteum through the first trimester and is the basis of pregnancy testing.
- Progesterone maintains the endometrium, relaxes smooth muscle throughout the body and suppresses uterine contraction.
- Estrogens increase substantially, promoting uterine growth and breast development.
- Relaxin increases ligamentous laxity, particularly at the pelvic joints, in preparation for delivery.



RUHANI COLLEGE

OF HEALTH BUSINESS AND TECHNOLOGY

- Human placental lactogen promotes maternal insulin resistance, preserving glucose for the fetus and accounting for gestational diabetes.
- Prolactin rises through pregnancy in preparation for lactation.
- Blood volume increases by roughly forty per cent, and the pregnant state is prothrombotic.

Consequences for manual therapy

- Progesterone-mediated smooth muscle relaxation contributes to reflux, constipation and venous distension.
- Relaxin-mediated laxity means end-range stretching and vigorous joint mobilization are inappropriate, particularly at the sacroiliac joints and pubic symphysis.
- Increased blood volume with a prothrombotic state raises venous thromboembolism risk, so screening the lower limbs is essential.
- The enlarging uterus alters the centre of gravity, increasing lumbar lordosis and loading the low back and pelvis.

Positioning and safety

- Side-lying with pillow support is the standard position from the second trimester onward, and is comfortable and appropriate at any stage.
- Avoid prolonged supine positioning after the first trimester, because the uterus can compress the inferior vena cava and reduce venous return, causing hypotension and reduced placental perfusion.
- Do not use prone positioning after the first trimester, and only with a purpose-designed support and the patient's comfort if at all.
- Screen the lower limbs before treatment for unilateral swelling, warmth, redness or calf pain. If any is present, do not treat the limb and advise urgent medical assessment.
- Avoid deep pressure over the abdomen at any stage.
- Stop treatment and advise urgent assessment for vaginal bleeding, leakage of fluid, severe headache, visual change, sudden swelling of the face or hands, severe abdominal pain, or reduced fetal movement.

Canadian guidance on physical activity in pregnancy supports regular moderate activity for most people with uncomplicated pregnancies. Massage therapy is not exercise, but the same underlying principle applies: an uncomplicated pregnancy is not a reason to withhold appropriate care, and the modifications are about positioning and screening rather than avoidance.

Review Questions — Topic 6

16. Name five hormones of pregnancy and state the function of each.
17. State the positioning rules for pregnancy massage and explain the reasoning behind the supine restriction.
18. Describe the venous thromboembolism screening you perform before treating a pregnant patient's lower limb, and state what you do if it is positive.
19. List six findings during a pregnancy appointment that would cause you to stop treatment and advise urgent assessment.

Topic 7 — Puberty, Menopause and the Aging Endocrine System



RUHANI COLLEGE

OF HEALTH BUSINESS AND TECHNOLOGY

Puberty begins with reactivation of pulsatile GnRH release after a prolonged childhood quiescence. Gonadotropins rise, the gonads produce sex steroids, and secondary sexual characteristics develop. The growth spurt is driven by growth hormone and sex steroids together; the same sex steroids subsequently close the epiphyseal plates and end longitudinal growth.

- During the growth spurt, bone lengthens faster than muscle and tendon adapt, which contributes to reduced flexibility and to traction apophysitis at sites such as the tibial tuberosity.
- For patients under eighteen, consent and treatment must follow Ontario requirements under the Health Care Consent Act, 1996, including capacity assessment and appropriate involvement of a substitute decision-maker where the young person is not capable.

Menopause is defined retrospectively as twelve consecutive months without menstruation, following depletion of ovarian follicles. Estrogen and progesterone fall while FSH and LH rise markedly, since feedback inhibition is lost. The transition, perimenopause, typically spans several years.

- Features include vasomotor symptoms such as hot flushes and night sweats; sleep disturbance; mood change; vaginal and urinary tissue changes; and accelerated bone loss.
- Bone loss is most rapid in the first several years after the final menstrual period, which is when fracture risk begins to rise appreciably.
- Treatment planning: assume some reduction in bone density and adjust pressure and joint mobilization accordingly; keep the room comfortable and be prepared to adjust draping and temperature for vasomotor symptoms; and recognize that sleep disruption reduces growth-hormone-dependent tissue repair.

The aging endocrine system shows a gradual decline in growth hormone, sex steroids, DHEA and melatonin, reduced tissue sensitivity to insulin, and reduced thyroid reserve. The practical consequences are reduced muscle and bone mass, slower healing, more fragmented sleep, reduced thermoregulatory capacity and a higher prevalence of undiagnosed endocrine disease.

- Screen older patients for endocrine conditions rather than assuming that fatigue, weight change or cold intolerance are simply features of age.
- Assume reduced bone density and reduced skin resilience unless there is good reason not to.
- Allow more time for transfers and for the patient to rise from the table.

Review Questions — Topic 7

20. Describe the hormonal events initiating puberty and explain why the growth spurt both begins and ends because of sex steroids.
21. Define menopause, describe the hormonal changes, and state three treatment planning consequences.
22. Describe the changes in the aging endocrine system and state three practical adjustments for older patients.
23. State the consent requirement that applies when treating a patient under eighteen in Ontario.

Topic 8 — Circadian Rhythm, Sleep and Healing

- Melatonin is secreted by the pineal gland in response to darkness and entrains the sleep-wake cycle. Light exposure at night, particularly short-wavelength light from screens, suppresses it.
- Growth hormone is released mainly during slow-wave sleep and drives protein synthesis and tissue repair.



RUHANI COLLEGE

OF HEALTH BUSINESS AND TECHNOLOGY

- Cortisol peaks shortly after waking and falls to a trough near midnight; a disturbed cortisol rhythm is associated with poor sleep quality.
- Shift work disrupts all of these rhythms, and shift workers have higher rates of metabolic disturbance, insulin resistance and sleep disorder.

Why this belongs in a treatment plan. A patient whose sleep is chronically fragmented has reduced growth-hormone-dependent repair capacity, which limits how much any manual therapy can achieve. Recognizing this changes the realistic goals of treatment and makes sleep a legitimate topic in aftercare discussion.

What you can appropriately advise

- General sleep hygiene: consistent timing, a dark and cool sleeping environment, and reduced light exposure in the hour before sleep.
- That poor sleep may be limiting the results of treatment, framed as an observation rather than a diagnosis.
- Referral to a physician or nurse practitioner where sleep disturbance is persistent, severe or accompanied by loud snoring with witnessed pauses in breathing, which may indicate sleep apnea.

Recommending melatonin or any other supplement, or advising on a dose, is outside the massage therapy scope of practice regardless of whether the product is available without prescription.

Review Questions — Topic 8

24. Explain the roles of melatonin, growth hormone and cortisol in the daily cycle.
25. Explain why chronically poor sleep limits what massage therapy can achieve, and state what you may appropriately advise.
26. State why shift work is relevant to your assessment of a patient.

Topic 9 — The Five-Step Treatment Planning Framework

This framework assembles the entire course. It works for any endocrine presentation, including conditions you have not specifically studied, because it reasons from physiology to consequence rather than from memorized rules.

Step 1 — Screen

- Take a full health history including all endocrine conditions, all medications with the timing of the last dose, and the endocrine screening questions.
- Ask specifically about numbness or reduced sensation, dizziness on standing, bone density testing or fractures, and recent changes in medication.

Step 2 — Identify the tissue consequence

- Ask what this condition or medication has done to bone density, skin integrity, sensation, circulation, blood pressure regulation, healing rate and physiological reserve.
- This is the step most often skipped, and it is the step that determines everything after it.

Step 3 — Modify

- Pressure — reduce for reduced bone density, fragile skin or impaired sensation.



RUHANI COLLEGE

OF HEALTH BUSINESS AND TECHNOLOGY

- Positioning — accommodate rather than correct; side-lying in pregnancy; support kyphosis; avoid prolonged supine after the first trimester.
- Duration and pacing — shorten sessions and lengthen intervals where physiological reserve or healing is reduced.
- Technique — avoid joint mobilization, end-range stretching and loaded flexion where bone density is reduced; avoid friction where skin is fragile.
- Hydrotherapy — avoid heat and cold where sensation or circulation is impaired, and avoid heat in hyperthyroidism.
- Timing — schedule around insulin peaks and meals.
- Monitoring — check verbally at intervals where the patient's own feedback is unreliable.

Step 4 — Document

- Record the finding, the modification, the reason for the modification, the consent obtained and any advice given, with dates.

Step 5 — Refer and reassess

- Refer any red flag or undiagnosed pattern, and record that you did so.
- Reassess at the next visit; endocrine status changes with adherence, dose changes and disease progression.

Review Questions — Topic 9

27. State the five steps of the treatment planning framework and identify which is most often skipped.
28. Apply the framework to a patient with long-standing type 1 diabetes, peripheral neuropathy and a recent osteoporosis diagnosis.
29. Explain why the framework works for a condition you have never studied.

Topic 10 — Documentation, Consent and Scope of Practice

The regulatory framework

- Regulated Health Professions Act, 1991 — establishes the controlled acts. Communicating a diagnosis is a controlled act not authorized to massage therapists.
- Massage Therapy Act, 1991 — defines the massage therapy scope of practice in Ontario.
- Health Care Consent Act, 1996 — governs informed consent, including capacity and substitute decision-making.
- Personal Health Information Protection Act, 2004 — governs collection, use and disclosure of personal health information.
- CMTO Standards of Practice — including the standards on record keeping, consent and claims.
- FOMTRAC Inter-Jurisdictional Practice Competencies — the entry-to-practice competency framework.

What a competent record contains

- The endocrine condition and its current status, including medications and the timing of the last dose.
- The specific findings on which you based your decisions, in the patient's own words where relevant.
- The modifications you made and, critically, the reason for each.



RUHANI COLLEGE

OF HEALTH BUSINESS AND TECHNOLOGY

- The informed consent obtained, including the plain-language explanation given.
- Any advice given, including advice to seek medical assessment, with the date.
- The outcome and the plan for the next visit.

Scope boundaries

- You may recognize a pattern, modify treatment, document, advise medical assessment and refer.
- You may not communicate a diagnosis, interpret laboratory results, advise on starting, stopping or adjusting medication, recommend supplements or doses, or claim that massage treats or corrects an endocrine condition.
- You may not contact another practitioner about a patient without their written consent.

The test to apply to any claim you are about to make: could you support this statement if asked to justify it? If not, do not make it. Claims that outrun the evidence are a professional conduct matter under the CMTO Standards of Practice, quite apart from being inaccurate.

Review Questions — Topic 10

30. Name the four Ontario statutes governing your practice in this area and state what each covers.
31. List six elements a competent treatment record should contain for a patient with an endocrine condition.
32. State five things you may not do, and explain why the prohibition on communicating a diagnosis exists.
33. State the test to apply before making any claim about what your treatment will achieve, and give one claim that passes it and one that fails.

Final Preparation — What to Have Cold

- The HPG axis, pulsatile GnRH, and the selective role of inhibin on FSH.
- The four phases of the reproductive cycle with ovarian and uterine events.
- The LH surge as positive feedback, including the reversal of estrogen's effect and what terminates the loop.
- Primary versus secondary dysmenorrhea, and what massage can and cannot offer for endometriosis.
- The PCOS diagnostic basis and its metabolic implications for treatment planning.
- Primary versus secondary hypogonadism, and the tendon mechanism of anabolic steroid risk.
- Six pregnancy hormones with their functions, particularly relaxin and human placental lactogen.
- The pregnancy positioning rules, the vena cava reasoning, the DVT screen and the six urgent findings.
- The dual role of sex steroids in starting and ending the pubertal growth spurt.
- The menopause definition, hormonal pattern, and that bone loss is fastest in the first several years.
- The aging endocrine changes and why screening rather than attributing symptoms to age matters.
- The melatonin, growth hormone and cortisol daily cycle and its link to healing.
- The five-step framework in order, applied to at least three conditions from earlier lectures.
- The four statutes, the six elements of a competent record, and the test to apply before making any claim.



RUHANI COLLEGE

OF HEALTH BUSINESS AND TECHNOLOGY

Answer Key with Discussion

Work through each question in full before consulting this section. Each entry gives the expected answer, an explanation of why it is correct, and the error it is most commonly confused with. The discussion is part of the material, not an afterthought: understanding why a wrong answer is attractive is what prevents you from choosing it under examination pressure.

Answers — Topic 1: The Hypothalamic-Pituitary-Gonadal Axis

1. Trace the hypothalamic-pituitary-gonadal axis and state the specific actions of FSH and LH in each sex.

Answer. The hypothalamus releases GnRH in a pulsatile pattern; the anterior pituitary releases FSH and LH; the gonads produce sex steroids and inhibin, which feed back to inhibit both upper tiers. In the ovary FSH stimulates follicular development and estrogen production and LH triggers ovulation and supports the corpus luteum. In the testis FSH supports spermatogenesis through Sertoli cells and LH stimulates testosterone production by Leydig cells.

Why this is correct. The same two gonadotropins act on both sexes but on different cell populations, which is why one axis architecture serves both.

Commonly confused with. Assuming FSH and LH are sex-specific hormones. They are identical molecules in both sexes; only the target cells differ.

2. Explain the role of inhibin and why selective feedback on FSH is useful.

Answer. Inhibin is produced by ovarian granulosa cells and testicular Sertoli cells and selectively suppresses FSH release without affecting LH. Selective feedback is useful because it allows the two gonadotropins to be regulated independently, which is what permits the distinct hormonal phases of the reproductive cycle, including the suppression of further follicular recruitment while LH continues to rise toward the ovulatory surge.

Why this is correct. Without selective feedback the two gonadotropins would necessarily rise and fall together, and the phased cycle would be impossible.

Commonly confused with. Assuming inhibin suppresses both gonadotropins. Its selectivity is the entire point of its existence.

3. Explain why GnRH must be released in pulses, and describe functional hypothalamic suppression and its relevance to manual therapy.

Answer. Continuous GnRH exposure down-regulates pituitary GnRH receptors and paradoxically suppresses gonadotropin release, so pulsatility is required for the axis to function; this property is exploited by certain drug treatments that deliberately suppress the axis. Functional hypothalamic suppression occurs when substantial weight loss, very low body fat, intensive endurance training, chronic illness or sustained physiological stress reduces GnRH pulsatility and stops the cycle. It is relevant because prolonged suppression produces estrogen deficiency and therefore reduced bone density in a young patient who would not otherwise be considered at fracture risk.

Why this is correct. It is a tertiary disorder: the pituitary and gonads are structurally normal and the fault is at the hypothalamic level.

Commonly confused with. Assuming reduced bone density is a concern only in older patients. A young athlete with prolonged amenorrhea may have significantly reduced bone density.

Answers — Topic 2: The Reproductive Cycle and the LH Surge



RUHANI COLLEGE

OF HEALTH BUSINESS AND TECHNOLOGY

4. *Describe the four phases of the reproductive cycle with the ovarian and uterine events of each.*

Answer. Menstrual, days one to five: the functional endometrial layer is shed while a new cohort of follicles begins developing under FSH. Proliferative or follicular, days six to fourteen: one dominant follicle matures and secretes rising estrogen while the endometrium regenerates and thickens. Ovulation, about day fourteen: the LH surge ruptures the follicle and releases the oocyte, with the endometrium at full thickness. Secretory or luteal, days fifteen to twenty-eight: the corpus luteum secretes progesterone and the endometrium becomes receptive to implantation.

Why this is correct. The ovarian and uterine events are coordinated because the uterine changes are driven by the hormones the ovary is producing at each stage.

Commonly confused with. Treating the twenty-eight-day cycle as fixed. Cycle length varies; the luteal phase is the consistent portion at about fourteen days, and variation arises mainly in the follicular phase.

5. *Explain the LH surge as an example of positive feedback, including what terminates the loop.*

Answer. For most of the cycle estrogen inhibits gonadotropin release. In the late follicular phase, once estrogen has been sustained above a threshold concentration for a sufficient period, its effect on the pituitary reverses from inhibitory to stimulatory, so rising estrogen drives rising LH, which drives further estrogen production, producing a self-amplifying surge. Ovulation terminates the loop; the corpus luteum then secretes progesterone and negative feedback is restored.

Why this is correct. It is a genuine positive feedback loop because the response reinforces its own stimulus, and like all such loops it is terminated by an external event rather than by self-inhibition.

Commonly confused with. Describing the entire reproductive cycle as positive feedback. Only the LH surge is; the rest of the cycle operates by negative feedback.

6. *Explain what happens hormonally if fertilization occurs and how this differs from a non-conception cycle.*

Answer. If fertilization does not occur, the corpus luteum degenerates, progesterone and estrogen fall sharply, and hormone withdrawal causes the functional endometrial layer to be shed. If fertilization occurs, the developing embryo produces human chorionic gonadotropin, which maintains the corpus luteum so progesterone secretion continues, the endometrium is retained and implantation proceeds.

Why this is correct. The corpus luteum has a fixed lifespan unless rescued by hCG, which is why the presence or absence of an embryo determines whether menstruation follows.

Commonly confused with. Assuming the placenta maintains the pregnancy from the outset. The corpus luteum does so for roughly the first trimester, after which the placenta takes over.

Answers — Topic 3: Dysmenorrhea, Premenstrual Syndrome and Endometriosis

7. *Distinguish primary from secondary dysmenorrhea and state what a massage therapist can and cannot offer.*

Answer. Primary dysmenorrhea occurs without underlying pathology and results from prostaglandin-mediated uterine contraction and ischemia. Secondary dysmenorrhea results from an underlying condition such as endometriosis or fibroids and typically begins later in life or worsens over time. Massage can reduce associated muscular tension in the abdomen, low back, hips and pelvic region, and general relaxation may reduce reported pain; it cannot address the uterine cause, and this should be stated explicitly.

Why this is correct. The distinction matters because worsening or late-onset pain suggests secondary dysmenorrhea and warrants medical assessment rather than repeated treatment.



RUHANI COLLEGE

OF HEALTH BUSINESS AND TECHNOLOGY

Commonly confused with. Treating all menstrual pain as benign because it is common. New, severe or progressively worsening pain is a referral finding.

8. *Describe endometriosis and state four implications for treatment.*

Answer. Endometriosis is the presence of endometrial-like tissue outside the uterus, which responds to cyclical hormonal change and produces inflammation, adhesions and scarring, commonly causing severe menstrual pain, chronic pelvic pain, pain with intercourse, pain with bowel movements or urination, and subfertility. Implications: pressure tolerance may be low and highly variable between sessions because of adhesions and chronic pain sensitization; take reported pain seriously at face value; check in frequently and adjust pressure carefully; and be honest that treatment addresses associated musculoskeletal pain rather than the underlying lesions.

Why this is correct. Diagnosis is often delayed by many years, so many of these patients have had their pain repeatedly dismissed. Being believed is itself clinically significant.

Commonly confused with. Treating variable pressure tolerance as inconsistency on the patient's part. It reflects genuine cyclical and inflammatory variation.

9. *State two legitimate treatment goals for a patient with premenstrual symptoms and one claim you should not make.*

Answer. Legitimate: reduction of reported muscular tension, and reduction of reported anxiety and general discomfort. You should not claim that treatment will correct or rebalance the hormonal changes underlying the symptoms.

Why this is correct. The distinction is between symptomatic relief, which massage can plausibly offer, and hormonal correction, which it cannot and for which no evidence exists.

Commonly confused with. Assuming that because a symptom improves after treatment, a hormonal mechanism has been demonstrated. Symptomatic improvement does not establish mechanism.

Answers — Topic 4: Polycystic Ovary Syndrome

10. *State the diagnostic basis of polycystic ovary syndrome and name five of its features.*

Answer. Diagnosis requires at least two of three features: irregular or absent ovulation; clinical or biochemical evidence of excess androgens; and polycystic ovarian morphology on ultrasound. Features include irregular, infrequent or absent menstruation with reduced fertility; hirsutism, acne and scalp hair thinning; insulin resistance with increased risk of type 2 diabetes; increased cardiovascular risk factors; increased risk of gestational diabetes; and higher rates of anxiety and depression.

Why this is correct. Requiring two of three means the presentation varies considerably between individuals, which is why patients with PCOS do not all look alike.

Commonly confused with. Assuming polycystic ovaries on imaging are required for the diagnosis. Two of the three criteria suffice, and the ovarian appearance need not be one of them.

11. *Explain why PCOS is described as a metabolic condition as well as a reproductive one, and state what this means for your treatment planning.*

Answer. Because insulin resistance is present in a substantial proportion of patients regardless of body weight, with an increased risk of type 2 diabetes, dyslipidemia, hypertension and gestational diabetes. For treatment planning this means screening for diabetes and applying its precautions if present, screening for hypertension, and bringing the patient off the table with appropriate care.



RUHANI COLLEGE

OF HEALTH BUSINESS AND TECHNOLOGY

Why this is correct. The metabolic features are what generate the treatment modifications; the reproductive features generally do not change what you do with your hands.

Commonly confused with. Treating PCOS as a purely gynecological condition with no implications for manual therapy.

12. *State the correct approach to discussing hirsutism, acne or weight with a patient who has PCOS.*

Answer. Discuss these only if the patient raises them, and follow their lead in how much is discussed. They are frequently a significant source of distress, and unsolicited comment is inappropriate and can damage the therapeutic relationship. If the patient raises a concern, listen, take it seriously, and where appropriate encourage discussion with their physician.

Why this is correct. These features are visible, which makes it tempting to acknowledge them, but visibility does not make them an appropriate topic for the therapist to introduce.

Commonly confused with. Raising the topic to demonstrate awareness of the condition. Recognizing a feature and commenting on it are different things.

Answers — Topic 5: Testicular Function, Hypogonadism and Anabolic Steroids

13. *State the actions of testosterone and distinguish primary from secondary hypogonadism.*

Answer. Testosterone drives male secondary sexual characteristics, supports spermatogenesis alongside FSH, increases muscle and bone mass, maintains libido and stimulates erythropoiesis. In primary hypogonadism the testis has failed, so testosterone is low while LH and FSH are high. In secondary hypogonadism the fault is at the pituitary or hypothalamus, so testosterone, LH and FSH are all low.

Why this is correct. This is another application of the primary-versus-secondary rule: opposite directions indicate a peripheral fault, the same direction indicates a central one.

Commonly confused with. Focusing only on the reproductive effects. The bone density consequence is what changes your treatment.

14. *Explain why anabolic steroid use increases tendon rupture risk and state four practical implications.*

Answer. Supraphysiological androgen doses increase muscle mass and contractile strength more rapidly than tendon and ligament tensile strength adapts, so the muscle can generate forces the tendon is not prepared to transmit, particularly at the pectoralis major, biceps and quadriceps. Practical implications: avoid aggressive stretching and end-range loading; take any report of a sudden tearing or popping sensation seriously and refer; be aware of increased skin problems and infection risk; and note that hypertension may be present.

Why this is correct. The mismatch in adaptation rates between contractile and connective tissue is the entire mechanism, and it is why the risk persists even in a very strong patient.

Commonly confused with. Assuming that greater muscle strength means greater overall tissue resilience. The connective tissue has not kept pace.

15. *Describe the correct professional approach when a patient discloses anabolic steroid use.*

Answer. Receive the information without judgement or comment on the choice, record it accurately, use it to adjust the treatment plan by avoiding aggressive stretching and end-range loading and by remaining alert to hypertension and skin changes, and encourage medical follow-up where appropriate. The disclosure is clinically valuable and the patient should not be made to regret it.

Why this is correct. A patient who feels judged will withhold information at the next visit, and the information materially changes what is safe to do.



RUHANI COLLEGE

OF HEALTH BUSINESS AND TECHNOLOGY

Commonly confused with. Delivering advice about whether the patient should continue. That is outside scope and predictably ends the disclosure.

Answers — Topic 6: The Endocrinology of Pregnancy

16. *Name five hormones of pregnancy and state the function of each.*

Answer. Human chorionic gonadotropin maintains the corpus luteum through the first trimester and is the basis of pregnancy testing. Progesterone maintains the endometrium, relaxes smooth muscle and suppresses uterine contraction. Estrogens promote uterine growth and breast development. Relaxin increases ligamentous laxity, particularly at the pelvic joints. Human placental lactogen promotes maternal insulin resistance, preserving glucose for the fetus. Prolactin rises in preparation for lactation.

Why this is correct. Each has a direct consequence for manual therapy: smooth muscle relaxation, joint laxity, insulin resistance and the risk of gestational diabetes.

Commonly confused with. Listing the hormones without connecting them to the physical changes. The relaxin and hPL consequences in particular change your treatment.

17. *State the positioning rules for pregnancy massage and explain the reasoning behind the supine restriction.*

Answer. Side-lying with pillow support is the standard position from the second trimester onward and is appropriate at any stage. Prolonged supine positioning should be avoided after the first trimester because the enlarging uterus can compress the inferior vena cava, reducing venous return and causing maternal hypotension and reduced placental perfusion. Prone positioning should not be used after the first trimester, and only with a purpose-designed support and the patient's comfort if at all.

Why this is correct. The supine restriction is a mechanical circulatory issue rather than a general precaution, which is why it applies specifically to prolonged positioning after the uterus has enlarged.

Commonly confused with. Assuming supine is prohibited absolutely from conception. The concern arises as the uterus enlarges, and brief supine positioning with a lateral tilt may be acceptable.

18. *Describe the venous thromboembolism screening you perform before treating a pregnant patient's lower limb, and state what you do if it is positive.*

Answer. Screen for unilateral swelling, warmth, redness, and calf pain or tenderness. If any of these is present, do not treat the limb, advise urgent medical assessment, document the finding in the patient's own words and the advice you gave, and follow up.

Why this is correct. Pregnancy is a prothrombotic state with a substantially increased blood volume, so venous thromboembolism risk is elevated, and massage of a limb with an existing thrombus is a recognized hazard.

Commonly confused with. Treating bilateral ankle swelling as a red flag. Bilateral dependent swelling is common in pregnancy; it is the unilateral pattern with warmth or pain that concerns you.

19. *List six findings during a pregnancy appointment that would cause you to stop treatment and advise urgent assessment.*

Answer. Vaginal bleeding; leakage of fluid; severe headache; visual change; sudden swelling of the face or hands; severe abdominal pain; and reduced fetal movement.

Why this is correct. Several of these — severe headache, visual change and sudden facial or hand swelling — together suggest a hypertensive disorder of pregnancy, which is why they are grouped as urgent.

Commonly confused with. Waiting to see whether a severe headache with visual change settles. In pregnancy this combination requires assessment without delay.



RUHANI COLLEGE

OF HEALTH BUSINESS AND TECHNOLOGY

Answers — Topic 7: Puberty, Menopause and the Aging Endocrine System

20. *Describe the hormonal events initiating puberty and explain why the growth spurt both begins and ends because of sex steroids.*

Answer. Puberty begins with reactivation of pulsatile GnRH release after childhood quiescence, raising FSH and LH, which stimulate gonadal sex steroid production and the development of secondary sexual characteristics. Sex steroids act together with growth hormone to accelerate longitudinal growth, producing the growth spurt; the same sex steroids subsequently cause the epiphyseal plates to close, ending longitudinal growth.

Why this is correct. The dual role of sex steroids in driving and then terminating growth explains why early puberty is associated with reduced final adult height.

Commonly confused with. Attributing the growth spurt to growth hormone alone. Sex steroids are required for the spurt and are what ends it.

21. *Define menopause, describe the hormonal changes, and state three treatment planning consequences.*

Answer. Menopause is defined retrospectively as twelve consecutive months without menstruation, following depletion of ovarian follicles. Estrogen and progesterone fall while FSH and LH rise markedly because feedback inhibition is lost. Consequences: assume some reduction in bone density and adjust pressure and avoid vigorous joint mobilization; keep the room comfortable and be prepared to adjust draping and temperature for vasomotor symptoms; and recognize that sleep disruption reduces growth-hormone-dependent tissue repair, so allow appropriate intervals between sessions.

Why this is correct. The gonadotropin rise is a direct application of the primary disorder rule: the peripheral gland has failed, so the pituitary hormone rises.

Commonly confused with. Assuming bone loss is gradual and uniform after menopause. It is most rapid in the first several years, which is when fracture risk begins to rise appreciably.

22. *Describe the changes in the aging endocrine system and state three practical adjustments for older patients.*

Answer. There is a gradual decline in growth hormone, sex steroids, DHEA and melatonin, reduced tissue sensitivity to insulin, and reduced thyroid reserve, producing reduced muscle and bone mass, slower healing, more fragmented sleep, reduced thermoregulatory capacity and a higher prevalence of undiagnosed endocrine disease. Adjustments: screen for endocrine conditions rather than attributing fatigue, weight change or cold intolerance to age; assume reduced bone density and skin resilience; and allow more time for transfers and for the patient to rise from the table.

Why this is correct. The most important of these is the screening point: attributing endocrine symptoms to age is exactly how treatable conditions go undiagnosed in older patients.

Commonly confused with. Treating fatigue and cold intolerance in an older patient as an expected feature of aging. They are also the presentation of hypothyroidism, which is more common with age.

23. *State the consent requirement that applies when treating a patient under eighteen in Ontario.*

Answer. Consent must follow the Health Care Consent Act, 1996, which does not set a fixed age of consent but requires an assessment of the young person's capacity to understand the information relevant to the decision and to appreciate its consequences. Where the young person is capable, they consent for themselves; where they are not, consent is obtained from a substitute decision-maker. The assessment and the consent must be documented.

Why this is correct. Ontario law is capacity-based rather than age-based, which is a point frequently misunderstood.



RUHANI COLLEGE

OF HEALTH BUSINESS AND TECHNOLOGY

Commonly confused with. Assuming a parent must always consent for anyone under eighteen. Capacity, not age, determines who consents.

Answers — Topic 8: Circadian Rhythm, Sleep and Healing

24. *Explain the roles of melatonin, growth hormone and cortisol in the daily cycle.*

Answer. Melatonin is secreted by the pineal gland in response to darkness and entrains the sleep-wake cycle, and is suppressed by light exposure at night, particularly short-wavelength light. Growth hormone is released mainly during slow-wave sleep and drives protein synthesis and tissue repair. Cortisol peaks shortly after waking and falls to a trough near midnight, preparing the body for activity in the morning.

Why this is correct. The three hormones together form a coordinated daily cycle, which is why disrupting sleep disrupts all of them rather than only one.

Commonly confused with. Treating melatonin as a sedative. It is a timing signal that entrains the rhythm, not a hypnotic.

25. *Explain why chronically poor sleep limits what massage therapy can achieve, and state what you may appropriately advise.*

Answer. Because growth hormone, which drives protein synthesis and tissue repair, is released mainly during slow-wave sleep, so fragmented or insufficient sleep reduces the repair capacity on which treatment outcomes depend. You may appropriately advise general sleep hygiene such as consistent timing, a dark and cool environment and reduced light exposure before sleep; you may note as an observation that poor sleep may be limiting treatment results; and you may recommend medical assessment where sleep disturbance is persistent or severe or accompanied by loud snoring with witnessed pauses in breathing.

Why this is correct. The mechanism connects a physiological fact to a realistic treatment goal, and the advice stays within scope because it concerns behaviour and referral rather than diagnosis or prescription.

Commonly confused with. Recommending melatonin or another supplement. Availability without prescription does not bring it within the massage therapy scope of practice.

26. *State why shift work is relevant to your assessment of a patient.*

Answer. Because shift work disrupts the melatonin, growth hormone and cortisol rhythms simultaneously, and shift workers have higher rates of metabolic disturbance, insulin resistance and sleep disorder. It therefore predicts slower recovery between treatments, and it is a reason to screen for metabolic conditions and to set realistic expectations about treatment intervals and outcomes.

Why this is correct. It is a modifiable-context factor that changes what treatment can realistically achieve, which makes it worth asking about at intake.

Commonly confused with. Advising a patient to change their working pattern. Recognizing the physiological consequence is within scope; directing their employment is not.

Answers — Topic 9: The Five-Step Treatment Planning Framework

27. *State the five steps of the treatment planning framework and identify which is most often skipped.*

Answer. Screen; identify the tissue consequence; modify; document; refer and reassess. Step two, identifying the tissue consequence, is most often skipped, and it is the step that determines every modification that follows.

Why this is correct. Skipping step two forces the therapist to rely on memorized condition-specific rules, which fail as soon as an unfamiliar condition appears.



RUHANI COLLEGE

OF HEALTH BUSINESS AND TECHNOLOGY

Commonly confused with. Treating documentation as an administrative afterthought rather than a step in clinical reasoning. The record is where your judgement is demonstrated.

28. *Apply the framework to a patient with long-standing type 1 diabetes, peripheral neuropathy and a recent osteoporosis diagnosis.*

Answer. Screen: confirm insulin type and timing of the last dose, the last meal, whether they carry fast-acting carbohydrate, the extent and distribution of numbness, and any fracture history. Tissue consequence: unreliable pressure feedback from neuropathy; impaired circulation and healing; reduced bone density; risk of a hypoglycemic event during the session; possible postural hypotension from autonomic neuropathy. Modify: light to moderate pressure with frequent verbal checks; no deep thoracic or rib pressure, no joint mobilization or loaded spinal flexion; no hot or cold hydrotherapy on affected limbs; avoid pressure over injection and pump sites; skin inspection including the feet; slow assisted transfers; keep fast-acting carbohydrate available. Document: all findings, modifications, reasons, consent and advice. Refer and reassess: advise medical attention for any skin lesion found, and reassess status at each visit.

Why this is correct. Two independent constraints are present — impaired sensation and reduced bone density — and both independently limit pressure, so the more restrictive applies.

Commonly confused with. Applying only the diabetes modifications because that is the longer-standing diagnosis. The osteoporosis adds constraints the diabetes protocol does not cover.

29. *Explain why the framework works for a condition you have never studied.*

Answer. Because it reasons from physiology to consequence rather than from memorized condition-specific rules. If you can establish what a condition or medication has done to bone density, skin integrity, sensation, circulation, blood pressure regulation, healing rate and physiological reserve, the modifications follow from those consequences regardless of the name of the condition.

Why this is correct. There are only a limited number of tissue consequences that matter for manual therapy, but an unlimited number of conditions that can produce them.

Commonly confused with. Assuming you must know a condition before you can treat safely. You must know its consequences, which you can often establish by asking the patient directly.

Answers — Topic 10: Documentation, Consent and Scope of Practice

30. *Name the four Ontario statutes governing your practice in this area and state what each covers.*

Answer. The Regulated Health Professions Act, 1991 establishes the controlled acts, including that communicating a diagnosis is not authorized to massage therapists. The Massage Therapy Act, 1991 defines the massage therapy scope of practice in Ontario. The Health Care Consent Act, 1996 governs informed consent including capacity and substitute decision-making. The Personal Health Information Protection Act, 2004 governs the collection, use and disclosure of personal health information.

Why this is correct. Together they define what you may do, how you must obtain agreement to do it, and how you must handle the information you gather.

Commonly confused with. Attributing clinical practice standards to CMTCA. CMTCA accredits education programs; clinical standards come from the CMTO and the statutes above.

31. *List six elements a competent treatment record should contain for a patient with an endocrine condition.*

Answer. The endocrine condition and its current status including medications and the timing of the last dose; the specific findings on which decisions were based, in the patient's own words where relevant; the modifications



RUHANI COLLEGE

OF HEALTH BUSINESS AND TECHNOLOGY

made and the reason for each; the informed consent obtained including the plain-language explanation given; any advice given, including advice to seek medical assessment, with its date; and the outcome and the plan for the next visit.

Why this is correct. Recording the reason for each modification is what demonstrates clinical reasoning. A record listing only techniques does not show that judgement was exercised.

Commonly confused with. Recording modifications without their reasons. If the reasoning is not recorded, there is no evidence it occurred.

32. *State five things you may not do, and explain why the prohibition on communicating a diagnosis exists.*

Answer. You may not communicate a diagnosis; interpret laboratory results; advise on starting, stopping or adjusting medication; recommend supplements or doses; claim that massage treats or corrects an endocrine condition; or contact another practitioner about a patient without written consent. The prohibition on communicating a diagnosis exists because it is a controlled act under the Regulated Health Professions Act, 1991, restricted to authorized professions because an incorrect or premature diagnosis can cause serious harm by directing a patient toward the wrong treatment or delaying the right one.

Why this is correct. The controlled acts framework restricts activities by their potential for harm rather than by professional status alone.

Commonly confused with. Believing that hedged language such as 'it might be your thyroid' avoids the prohibition. Naming a suspected condition is a diagnostic communication regardless of hedging.

33. *State the test to apply before making any claim about what your treatment will achieve, and give one claim that passes it and one that fails.*

Answer. The test is whether you could support the statement if asked to justify it. A claim that passes: that many people report reduced tension and reduced anxiety after treatment, and that this is among the better-supported effects of massage. A claim that fails: that massage will lower the patient's cortisol or rebalance their hormones.

Why this is correct. The CMTO Standards of Practice require that claims about treatment effects be supportable, so this is a conduct requirement as well as a matter of accuracy.

Commonly confused with. Assuming that a claim is acceptable because it is widely repeated within the profession. Prevalence is not evidence.