


American Association of Medical Acupuncturists




Workshop
Female & Male Infertility
Plus Acupuncture & In Vitro Fertilization

Paul C. Magarelli, M.D., Ph.D.
Judith Balk, M.D., MPH
Bruce Gilbert, M.D., Ph.D., FAAMA

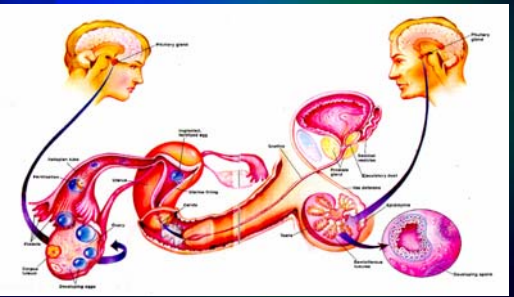
Guest: Diane K. Cridennda, L.Ac.

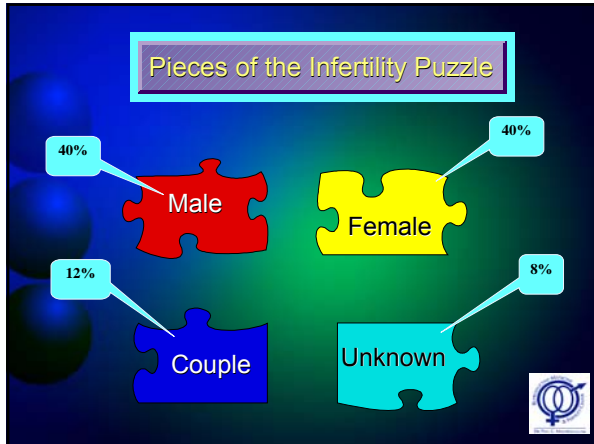
Workshop Outline

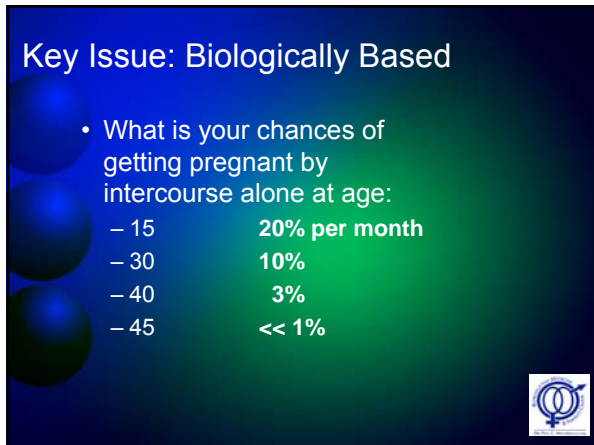
- Part 1
 - The Western Approach
 - Evaluation of Female and Male Infertility
 - Dr. Magarelli: Female Issues
 - Dr. Gilbert: Male Issues
- Part 2
 - Acupuncture
 - Clinical Pearls, Literature Review and Treatment Paradigms
 - Dr. Balk: Female Infertility
 - Dr. Gilbert: Male Infertility
- Part 3
 - State of the ART on IVF and TCM Treatments
 - Dr. Magarelli and Diane Cridennda, L.Ac.
- Panel Discussion & Q/A

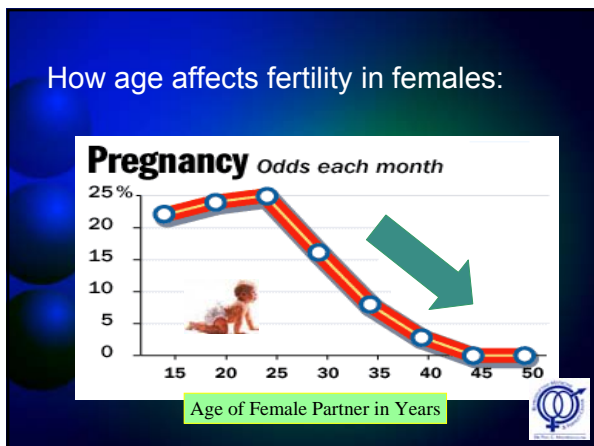


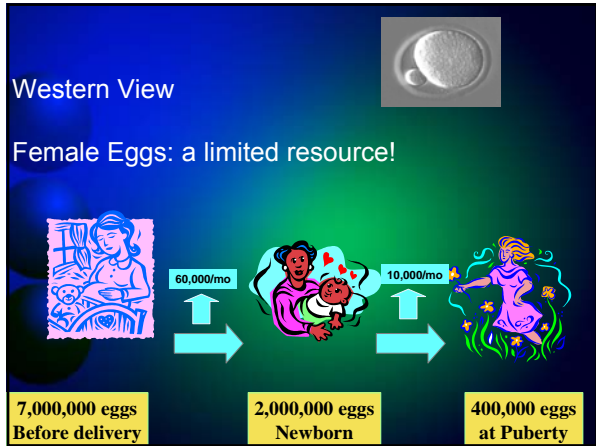
Biology of Reproduction

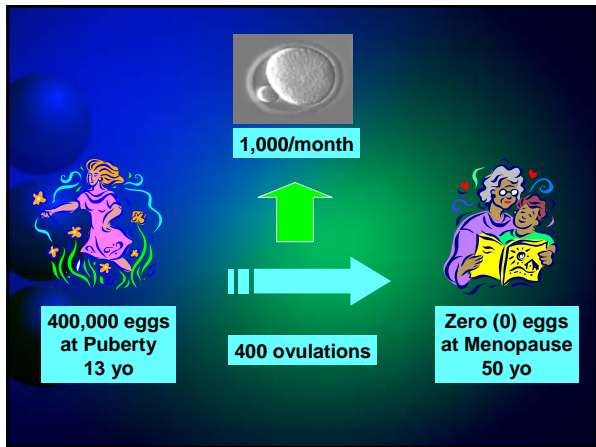


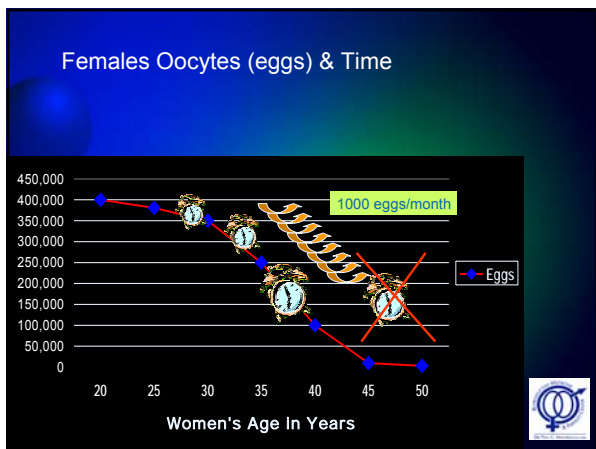


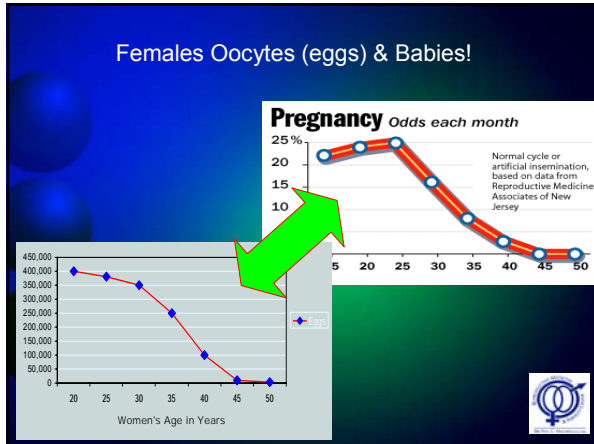










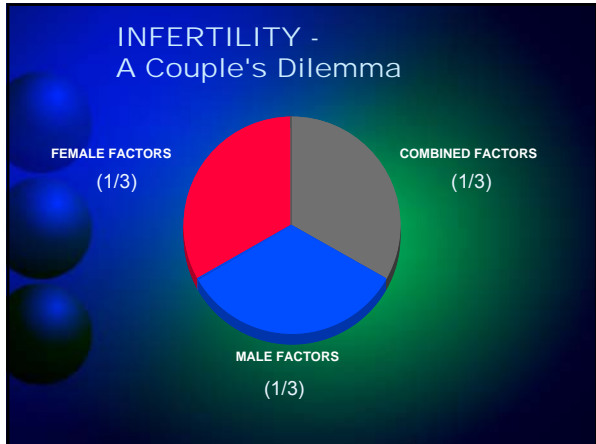


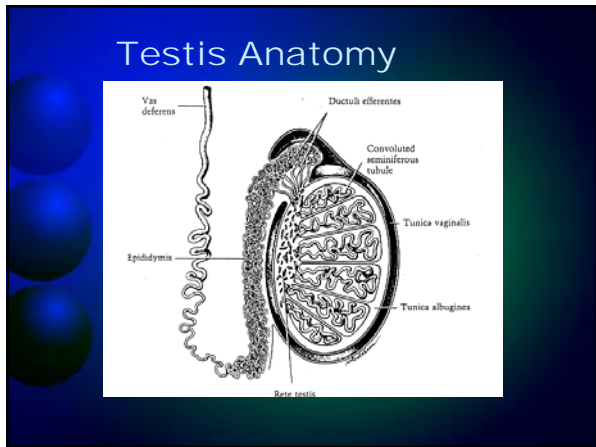
Key Concept

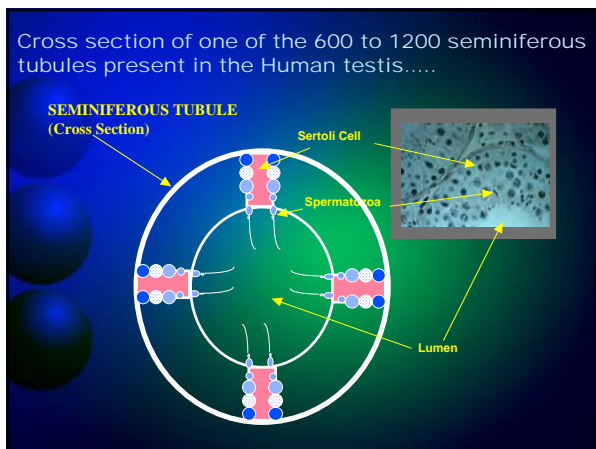
- Women make NO eggs during their lifetimes!

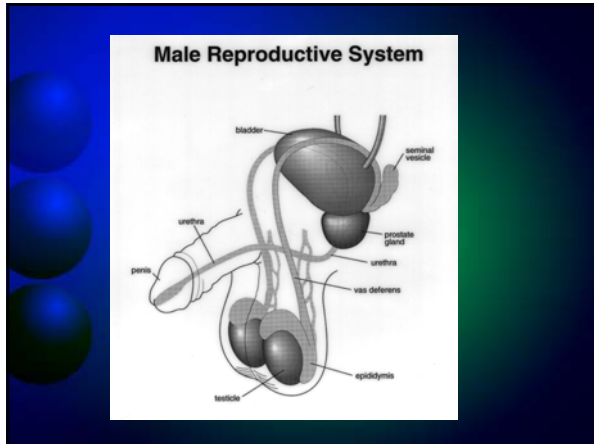
Physiology of Male Subfertility

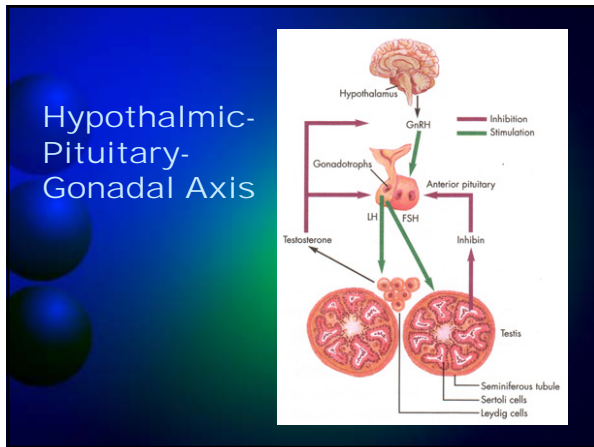
Bruce R. Gilbert, MD, PhD, FAAMA
Associate Clinical Professor of Urology
Associate Clinical Professor of Male Reproductive Medicine
Weill Cornell Medical College

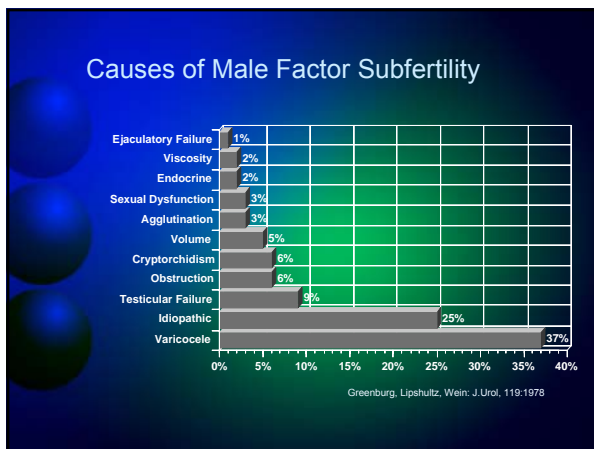












It takes a lot of motile sperm.....

...to fertilize an egg

Treatment of Male Factor Subfertility

Non Surgical Options

- Conservative Therapy (Dietary changes, lifestyle changes)
- Complementary Approaches (Acupuncture, Herbal)
- Medical Treatment (Nutritional, Antibiotic, Hormonal)
- Assisted Reproductive Technology (IUI, IVF/ICSI)

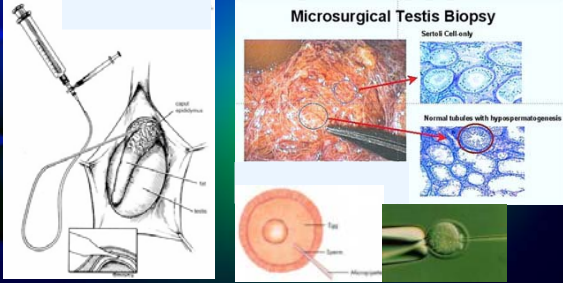
Treatment of Male Factor Subfertility

SURGICAL TREATMENT:

- Diagnostic and Therapeutic Procedures (biopsy, vasogram)
- Corrective Procedure (Varicocele Ligation)
- Reconstructive Procedures
- Microsurgical Vasovasostomy and Vasoepididymostomy
- Resection of Prostatic Obstruction
- Sperm Retrieval (Open/Perc)
 - Epididymal
 - Testicular
 - Seminal vesicle

Microsurgical Sperm Retrieval

- Epididymal
- Testicular

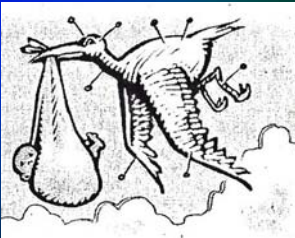


The slide contains several diagrams and histological images. On the left, a diagram shows the epididymis and vas deferens with a microsurgical approach. On the right, a section titled 'Microsurgical Testis Biopsy' shows a testis being biopsied. Below this, there are two histological images: one labeled 'Sertoli Cell only' showing seminiferous tubules with only Sertoli cells, and another labeled 'Normal tubules with hyperpermatogenesis' showing tubules with normal spermatogenesis. At the bottom, there are two small images: one of a sperm cell and another of a testis cross-section.

Part 2: Acupuncture and Infertility Clinical Pearls

Judith Balk, MD MPH
April 8, 2006
AAMA

Acupuncture and Fertility



The slide features a black and white illustration of a dragon-like creature, possibly a Qilin, which is a mythical Chinese creature often associated with good fortune and fertility. The creature is depicted with a dragon's body and a horse's head, carrying a large, rounded object (possibly a child or a bundle) in its mouth. The background is a dark blue gradient with several glowing green circles on the left side.

TCM Clinical Pearls

From the book "Plain questions"

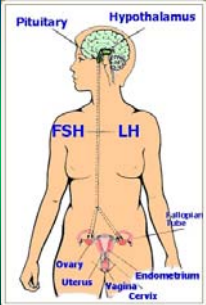
- "Sufficient kidney qi leads to normal menstrual function; dredging the *Ren* Channel and activating the *Chong* channel results in regular menstruation and thence to pregnancy."
- As early as 259 AD, acupuncture formulae were given for infertility.

Commonly affected meridians

- Chong Mo
- Kidney
- Liver
- Spleen
- Conception Vessel

Acupuncture and Infertility

- Anovulation
- Polycystic ovary disease
- HPO axis dysfunction
- Poor uterine artery perfusion
- Adjunct to IVF
- Unexplained



Acupuncture in Normally Ovulating Women

- **Acupuncture affects endocrine function**
- Points: **Ki-12, CV-3, CV-4**, low freq stim
- LH-RH stimulation test with or w/o ap
- Greater increases in LH and FSH from LHRH with acupuncture than without

Aso T et al. The influence of acupuncture stimulation on plasma levels of LH, FSH, Progesterone and Estradiol in Normally Ovulating Women. Am J Chinese Med 1976;4(4):391-401.

Loci of acupuncture stimulation

Diagram illustrating the JEN-MO MERIDIAN and three acupuncture points:

- Co-3 中脘 Chung-Chi**: about 8 cm below the umbilicus
- Co-4 關元 Kuan-Yuan**: about 8 cm below the umbilicus
- Ki-12 次髎 Ta-Ho**: about 8 cm below the umbilicus and 1.5 cm from Chung-Chi

Can acupuncture help women to ovulate?

- Sometimes!
- 34 patients with ovulatory dysfunction by history, ultrasound, BBT
- 35% marked and 48% slight improvement in ovulation
- Labs: bidirectional changes (towards normal) for FSH, LH, E2

Can acupuncture help women to ovulate?

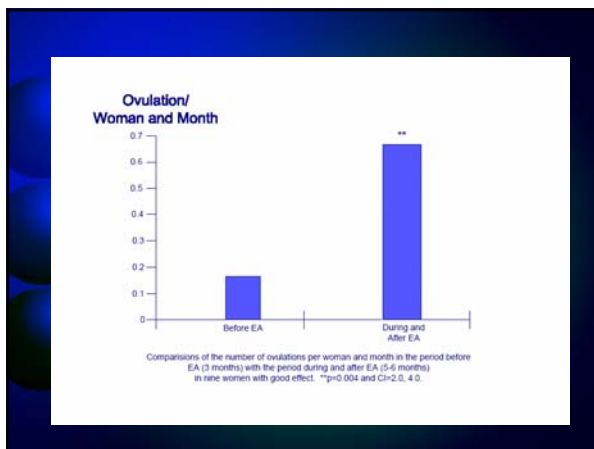
- Point selection:
 - **BI-23 and BI-18** to tonify the liver and kidneys
 - **CV-3 and CV-4** to reinforce primordial qi and to regulate the flow of qi and blood
 - **Sp-6** to regulate the three Yin channels
 - **Extra points 16 and 19** to tonify liver and kidneys, regulate the Ren and Chong meridians, and nourish the uterus
- Technique: just enough to obtain de qi, then retained for 20-30 minutes
- 3/week for 3 months

Xiaoming M et al. Clinical studies on the mechanism for acupuncture stimulation of ovulation

What about anovulation in PCOD?

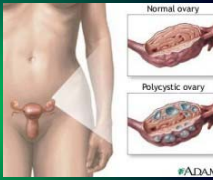
- **It works for some women: Lean, ↓ metabolic defects**
- 24 women
- EA 2x/week x 2 wks, then q wk x 6-10 wks
- **BI-23 → BI-28 @2 Hz x 30'**
- **Sp-6 → Sp-9 @2 Hz x 30'**
- **MH-6, TH-5, GV-20** manual stim
- 9 women began to ovulate
- ↓ in LH/FSH, testosterone []

Stener-Victorin et al. Effects of electro acupuncture on anovulation in women with polycystic ovary syndrome. Acta Obstet Gynecol Scand 2000;79:180-88



Polycystic Ovary Disease: Case Report

- 32 yo with primary infertility and PCOD x 6 years
- CV-4, CV-3, Extra-16, Sp-6
- Extra 16 is Uterus Pt, 4 cun ↓ umb, 3 cun lateral
- 5 daily treatments with high freq stim x 25
- Menstrual cycle d 9-13 for 2 cycles
- First cycle: no spontaneous bleed
- 2nd-4th cycles: regular menses
- 5th cycle: spontaneous full-term pregnancy



Xu J et al. Acupuncture in the treatment of polycystic ovarian syndrome: a case report. FRICT 2002:71.

Induction of Ovulation

- On Cycle Day 10-12: CV-4, CV-3, Sp-6, Extra-16 for 30 minutes, low freq stim x3 days
- 6/13 cycles with EA had ovulation
- EA ovulation induction works when there depression of sympathetic activity

Chen B-Y et al. Relationship between blood radioimmunoactive beta-endorphin and hand skin temperature during the electro-acupuncture induction of ovulation. Acu & Electrother res. Int J 1991;16:1-5.

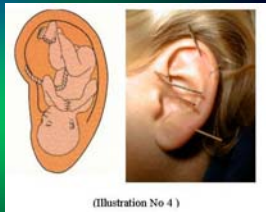
Is ↓ sympathetic activity a marker of acupuncture working, or is the ↓ sympathetic activity the effective component?

Changes of HST	Ovulation	No Ovulation	Total
Increased	5*	1	6
Decreased	1	6	7

*p<0.05 as estimated by X² test

Auricular acupuncture for oligomennorrhoea or luteal insufficiency

- N=45 infertile women
- Results compared to hormone treatment
- Matched for age, BMI, tubal patency, etc
- One tx/week, each 30', x 3 months
- Points: gonadotropin, ovary, uterus, gestagen, kidney, H-P, spleen, omega, and secondary psychosomatic points



(Illustration No 4)

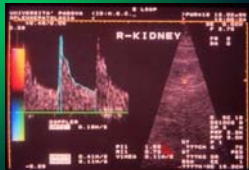
Auricular acupuncture

- No difference in pregnancy rates, but 7 in the acupuncture group also received hormones.
- Side effects only in hormone group
- 44% of those with menstrual irregularities remained infertile after acupuncture vs. 56% of controls
- Conclusion: A/P is alternative tx for female infertility due to hormone disorders. (?)

Gerhard I and Postneek F. Auricular acupuncture in the treatment of female infertility. Gynecol Endocrin 1992;6:171-81.

Pulsatility Index

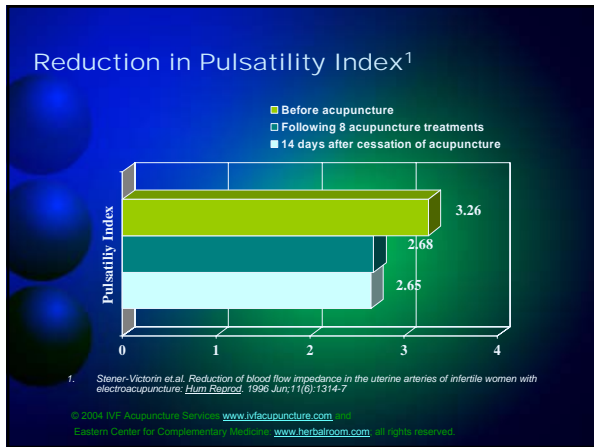
- Pulsatility Index greater than 3.0 at the time of embryo transfer may predict 35% of the failures to become pregnant (Steer et al. 1992)
- Acupuncture can significantly lower PI (Stener-Victorin et al. 1996)



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Poor uterine artery perfusion

- Infertile, healthy women with $PI \geq 3.0$
- A/P twice per week x 4 weeks, 30' each
- Decreased sympathetic outflow
- BI-23 → BI-28 (100 Hz)
- Sp-6 → BI-57 (2 Hz)
- One of the protocols in Paul's study



Adjunct to IVF—embryo transfer

- N=160: acupuncture versus no acupuncture
- 25' before and after ET
- Clinical pregnancy in 42.5% vs 26.3%
- Pre-ET: MH-6, Sp-8, Liv-3, GV-20, St-29
- Post-ET: St-36, Sp-6, Sp-10, LI-4
- Ear: Shen-men, Zhigong, Neifenmi, Naodian
- Part of Paul's study

Paulus et al. Influence of acupuncture on the pregnancy rate in patients who undergo assisted reproduction therapy. *Fertil Steril* 2002;77(4):721-4

Adjunct to IVF

- **Hypothesis: acupuncture that enhances the HPO axis and relaxes the uterus may improve pregnancy rates in IVF.**
- At least one prior unsuccessful IVF cycle
- AP vs sham AP (toothpicks & guide tubes), eye pillows, heat lamp to abd
- If no pregnancy, crossed over to other arm

Quintero et al. A randomized, controlled, double-blind, crossover study evaluating acupuncture as an adjunct to IVF. Fertil Steril 2004;81 (supp 3):11-12

Adjunct to IVF

- 17/49 eligible subjects enrolled
- 4 ongoing pregnancies after first cycle, 2 per arm
- 4 in ap had chem pregnancy, 1 in sham arm
- After unsuccessful subjects crossed-over for 2nd cycle, 2 pregnancies in ap, 1 in sham
- 70% PR in ap group vs 30% in sham
- No difference in ongoing PR

Quintero et al. A randomized, controlled, double-blind, crossover study evaluating acupuncture as an adjunct to IVF. Fertil Steril 2004;81 (supp 3):11-12

Adjunct to IVF

- 7 subjects completed both arms of the study
- Used less gonadotropins in ap group
- 2 cycle cancellations, both in sham group
- None of the 5 patients with endometriosis had a viable pregnancy, nor 1 patient with Asherman's
- Points chosen for different components of IVF cycle, at 4 points during IVF cycle.

Quintero et al. A randomized, controlled, double-blind, crossover study evaluating acupuncture as an adjunct to IVF. Fertil Steril 2004;81 (supp 3):11-12

Adjunct to IVF

- 1: **Stimulate the HPO axis:** Day 1-7: SP-6, ST-36, SP-9, ST-28, ST-29, CV-4, CV-6, LI-4. Tonification on all x 40'
- 2: **Target the ovary:** Day 10 to retrieval: BL-40, BL-57, BL-23, BL-25, GB-21, GB-20: Neutral on BL-23 and BL-25; Sedation on others; 40'
- 3: **Uterine relaxation, increase uterine blood flow:** Retrieval to transfer; SP-10, L.I.-4, L.I.-11, LIV-3, ST-28, ST-29, ST-25; Sedation on SP-10; Neutral on others; 45'
- 4: Within 48 hours after transfer: GV-20, REN-12, REN-6, ST-36, LI-11, add ear seed on left ear Shenmen and Endocrine; Tonification on all: 45'

Brandon Horn, JD, L.Ac. Eastern Center for Complementary Medicine, PC

Implantation Rates¹

Group	Implantation Rates (%)
Control Group	~25%
Acupuncture Group	~75%

1. Quintero et al. A Randomized, Double-Blind, Controlled Cross-Over Study Evaluating Acupuncture as an Adjunct to In-Vitro Fertilization. *Fertility and Sterility*, Vol. 81, Supplement 3, April, 2004

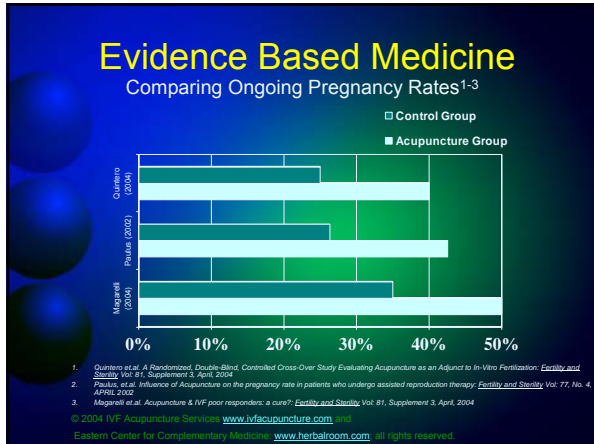
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Reduction in Gonadotropin Use¹

Group	Average Gn Use (IU)
Control Group	~5000
Acupuncture Group	~3500

1. Quintero et al. A Randomized, Double-Blind, Controlled Cross-Over Study Evaluating Acupuncture as an Adjunct to In-Vitro Fertilization. *Fertility and Sterility*, Vol. 81, Supplement 3, April, 2004

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Point selection of presented studies

Study	CV-3	CV-4	St-23	sp-4	St-28	sp-8	var	St-37	St-6	Sp-6	Liv-3	CV-24	St-29	St-35	sp-10	Liv-4
Aso	X	X														
Xiangming	X	X	X	X												
S-V			X	X	X	X										
Xu	X	X		X												
Chen	X	X		X												
Gerhard							X									
S-V			X	X	X			X								
Paulus				X			X		X	X	X	X	X	X	X	X
Quintero	X	X	X			X	X	X			X	X	X	X	X	X
Magarelli			X	X	X			X	X	X	X	X	X	X	X	X

Acupuncture energetics Chong Mo Endocrine Protocols

- Ovaries: Signal program → Yang Ming
 - CV-2, CV-4, St-30 → St-36, St-40, St-43, St-44
- Uterus: Signal program → Shao Yang
 - CV-2, CV-4, St-30 → GB-30 → GB-34, GB-39
- Uterus: Signal program → Dai Mo
 - same → GB-26 → TH-5, GB-41, Bl-63
- HPO (ant pit): Signal program → Shao Yang
 - Liv-14, GB-20 → GB-34, GB-39

Fu Xi Graphs 1 & 2 with Curious Meridian Overlay

TCM diagnosis

- Kidney Yin Deficiency
- Kidney Yang Deficiency
- Spleen Qi Deficiency
- Blood Deficiency
- Blood Stasis
- Liver Qi Stagnation
- Heart deficiency
- Excess Heat
- Dampness

TCM diagnosis

- Most infertility patients have 2-4 diagnoses
- Mental health, social fxn, emotional roles declined, esp. with qi deficiency or blood stagnation
- No overlap between TCM dx and physical or general health.

Coyle M et al. A survey comparing TCM diagnosis, health status, and medical diagnosis in women undergoing assisted reproduction. Acupuncture in Medicine 2005;23(2):62-69


Mean (SD) SF36 scores for various TCM diagnoses

Mean (SD)	Social Function	Vitality	Physical Function	Physical Role function	Bodily Pain	Mental Health	Emotional Role function	General Health perceptions
TCM Diagnosis								
Kidney Yang Deficiency	81.3 (23.1)	59.5 (20.5)	88.9 (18.5)	81.1 (33.8)	73.3 (16.7)	72.1 (15.1)	78.2 (34.0)	72.0 (16.3)
Kidney Yin Deficiency	81.0 (22.3)	58.1 (18.0)	90.9 (16.6)	87.4 (26.2)	75.4 (17.0)	71.9 (15.3)	79.6 (33.0)	71.0 (61.2)
Qi Stagnation	77.5 (24.6)*	55.9 (18.6)	90.1 (16.1)	82.9 (32.2)	74.8 (14.9)	69.6 (16.9)*	73.4 (36.9)*	71.2 (18.6)
Blood Stagnation	75.8 (24.1)‡	52.3 (19.3)	89.3 (15.3)	82.5 (30.3)	71.2 (18.3)	67.5 (16.8)§	70.0 (37.2)‡	68.4 (18.5)
Blood Deficiency	83.7 (20.2)	57.9 (18.2)	88.6 (21.1)	86.1 (29.7)	75.9 (14.9)	72.4 (13.9)	73.0 (37.8)*	74.6 (14.4)
Damp	79.3 (23.9)	53.0 (17.9)	84.0 (21.3)*	77.1 (36.1)	70.0 (17.0)	70.4 (14.2)	82.8 (29.6)	69.0 (18.5)
Multiple TCM Diagnoses								
1-2 diagnoses (n=50)	87.8(18.8)	60.5(17.6)	93.2(11.2)	93.0(20.2)	78.1(13.4)	77.1(13.1)	86.0(30.2)	75.2(15.7)
3-4 diagnoses (n=180)	82.9(21.9)	56.2(19.8)	87.9(18.9)	82.4(34.2)	73.0(17.7)	72.3(14.4)	80.6(31.6)	70.3(16.1)
>4 diagnoses	67.1(25.8)‡	51.8(19.6)	92.8(15.4)	80.3(28.4)	73.4(16.7)	61.7(18.2)‡	57.9(42.8)‡	69.8(20.1)

*p<0.05; †p<0.01; ‡p<0.005; §p<0.001

TCM-Spleen Qi Deficiency

- Fatigue, poor appetite, crave sweets
- Low energy, bloating after eating
- Cold hands/feet/nose
- Premenstrual spotting, Uterine prolapse
- Easy bruising/poor circulation/varicose veins
- Points: Sp-6, St-36, CV-6, Sp-4



Blood and Qi weakness
The main manifestations are excessive or scanty menses, which are light-colored and thin. Individuals are usually delayed in menstruation and may have a dull pain in the lower abdomen after each cycle. Other associated symptoms are dizziness, palpitations, dull or sallow complexion, fatigue, limb numbness and insomnia.


On examination, the tongue is pale with thin and white fur; the pulse is thready and weak or deep and thready.

TCM-Blood deficiency

- Dry, flaky skin, chapped lips
- Hair loss or dry, brittle hair
- Diminished nighttime vision
- Pale lips, tongue, eyelids
- Dizziness/lightheadedness premenstrual
- Points: Sp-6, St-36, Liv-8

TCM- Blood Stasis

- Midcycle ovulatory pain
- Painful breast lumps
- Hemorrhoids
- Endometriosis or fibroids
- Dark Tongue
- Menstrual blood contains clots
- Points: Sp-6, Sp-8, Sp-10, BI-17




Qi and blood stagnation
The main manifestations are irregular menstruation and dysmenorrhea (painful menses). The menses are purplish dark with plenty of blood clots. There may also be infrequent menstruation. Other associated symptoms are scaly skin, purplish lips, brownish spots or pigmentation on the face, distending pain in the breasts and lower abdomen. Individuals usually suffer from uterine myoma (muscular tumor), ovarian cysts or masses in the pelvic region.

On examination, the tongue is darkish red. Bleeding spots may be found in the margin. The pulse is deep and taut.

TCM-Liver Qi stagnation

- Prone to depression, anger, rage
- Irritable premenstrual
- Bloating/irritable periovulatory
- Premenstrual breast pain and swelling
- Dysmenorrhea
- Insomnia
- Points: LI-4, Yintang, Tai Yang, BI-2



Liver-qi stagnation
The main manifestations are irregular cycles with impeded menstrual flow. The color is darkish red with small pieces of blood clots. There is distending pain in the breasts and abdomen before the menstruation cycle begins. Other associated symptoms are an uneasy mind, irritability, depression, sighing, or feeling sad without reason in severe cases.

On examination, the tongue is darkish red with a thin and white fur. The pulse is deep and thready.

TCM: Heart deficiency


- Early morning waking
- Nightmares
- Prone to agitation, fidgeting
- Heart palpitations, esp when anxious
- Lacking in vitality
- Points: Ht-7, CV-14, CV-15, BI-15, BI-44
- Auricular point: shen-men

TCM- Excess Heat

- Rapid pulse
- Dry mouth, thirsty for cold drinks
- Feel warm
- Night sweats/hot flushes
- Short menstrual cycles
- Points: Liv-2, Sp-10, LI-11, BI-40

TCM- Dampness

- Feel tired/sluggish after a meal
- Fibrocystic breasts
- Cystic acne
- Prone to vaginal candidiasis/pruritis
- Overweight
- PCOD
- Points: Sp-9, St-40, CV-12, DV-3, Sp-6, Bl-66



Interior struck by phlegm and dampness
 The main manifestations are menopause or a delay in cycles, impeded menstrual flow and scanty menses. Individuals usually have excessive thick vaginal discharge. Other associated symptoms are being overweight, chest oppression, retching, poor appetite, loose bowels, a bright pale complexion, fatigue, excessive sweating, dizziness and heart palpitations.

On examination, the tongue is pale, bulky and tender and may have indentation markings around the margin from the teeth. White and greasy fur may cover it. The pulse is deep, slow and rolling.

Luteal Phase Deficiency

- Yin condition
- Tonification technique
- Use points Ki-7, St-36, CV-6, GV-4, Bl-23, Bl-52
- Chong Mo

To regulate the HPO axis

- Use curious meridians
 - Chong Mo (Sp-4, MH-6)
 - Conception Vessel (Ki-6', Lu-7)
 - Governing Vessel (SI-3, Bl-62')
- Additional points: Sp-6, St-30, CV-3, CV-4

Summary

- Difficult to study in RCT
- Timing: recommend 3 months
- Protocols focus on Sp, Ki, Liv, Chong Mo
- If known Western diagnosis, treat that also
- If unexplained, look for patterns and treat using acupuncture energetics

Application of Acupuncture to Male Fertility

Bruce R. Gilbert, MD, PhD, FAAMA
Associate Clinical Professor of Urology
Associate Clinical Professor of Male Reproductive Medicine
Weill Cornell Medical College



Two recent papers suggest an improvement in motility with acupuncture

- *Effect of acupuncture on sperm parameters of males suffering from subfertility related to a low sperm quality*, S Siterman, Archives of Andrology, 39:155-161,1997
- *Quantitative evaluation of spermatozoa ultra structure after acupuncture treatment for idiopathic male infertility*, J Pei et al, Fertility Sterility 84:141-147, 2005

S Siterman, Arch Andro, 39:155-161,1997

- Prospective, Controlled (historical) study of 32 men with impaired semen quality
- Semen specimens were analyzed before and one month after treatment for 16 men, treated 2 times a week for 5 weeks
- 16 matched controls (semen specimens given 6 months apart)
 - Age 26.1 ± 6.2 years
 - Similar decrease in sperm count, motility and morphology
 - **60% chronic prostatitis**
 - 48% varicocele

S Siterman, Arch Andro, 39:155-161,1997
METHODS:

- TCM diagnosis
- Maximum 12 points used: LU-7, LI-4, LI-11, ST-30, **ST-36**, **SP-6**, SP-9, **SP-10**, HT-7, BL-20, **BL-23**, BL-33, KI-6, KI-7, MH-6, LR-5, LR-8, CV-1, CV-2, CV-4, CV-6, GV-4
- De Qi noted
- 25 minute treatment
- 2 treatments a week for 5 weeks

S Siterman, Arch Andro, 39:155-161,1997
RESULTS: (treated group)

- **No Change**
 - Sperm Concentration
- **Improvement**
 - % Viable sperm
 - Total Motile Sperm
 - Total Functional Sperm Fraction (TFSF)
 - = (total cells x % motility x % normal morphology)

Sperm Parameters	Control (initial)	Control (6 months)	Treated (pre)	Treated (post)
Density ($10^6/ml$)	230 \pm 217	208 \pm 270	233 \pm 318	265 \pm 202
Viability (%)	52.7 \pm 20.5	56.5 \pm 19.7	52.0 \pm 26.8	65.1 \pm 21.5*
Total motile sperm/ml ($\times 10^6$)	21.5 \pm 31.8	20.3 \pm 30.7	17.7 \pm 22.4	37.3 \pm 35.4*
Total progressively motile sperm/ml ($\times 10^6$)	14.2 \pm 22.7	14.0 \pm 7.9	8.5 \pm 15.3	19.3 \pm 20.0
Normal morphology (%)	32.2 \pm 16.1	34.7 \pm 17.4	30.5 \pm 14.5	36.2 \pm 16.4
TFSF	34.9 \pm 26.4	31.2 \pm 22.5	20.0 \pm 33.6	53.8 \pm 53.5*

Quantitative evaluation of spermatozoa ultrastructure after acupuncture treatment for idiopathic male infertility, J Pei et al, Fertility Sterility 84:141-147, 2005

- Prospective controlled study of 40 men with impaired semen quality (IRB approved)
- 28 treated patients
- 12 untreated matched controls
 - Age 33 (range 25 to 46) w/ 2 y infertility
 - Normal hormonal profile (T,FSH,LH,PRL,E2)
 - 2 semen analyses confirming impairment
 - Female partners evaluated. Tubal patency confirmed
 - Exclusions: identifiable infertility, azoospermia, infectious disease, abnormal psychological stresses

J Pei et al, Fertility Sterility 84:141-147, 2005
METHODS:

- Points used: **CV-4, BI-23, BI-32, LR-3, KI-3, ST-36, SP-6, SP-10, ST-29, GV-20**
- De Qi noted, 25 minute treatment, 2 treatments a week for 5 weeks
- 2 Semen analyses were obtained prior to treatment and afterwards
- Transmission electron microscopy was used for ultramorphologic analysis of sperm

J Pei et al, Fertility Sterility 84:141-147, 2005
RESULTS:

- No change:
 - Condensed Chromatin
 - Apoptosis
 - Immature sperm
 - Necrosis

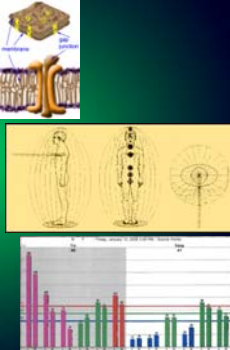
Sperm Parameters	Control (initial)	Control (6 months)	Treated (pre)	Treated (post)
% motile (median)	32 %	37 %	44.5 %	50 %
"Healthy Sperm" (Baccetti et al., J. Androl, 1995;16, 356-371)	0.16 %	0.10 % (approx)	0.06 %	0.26 % ($> 0.2 \times 10^6$ sperm)
Acrosome (nl position)	65 %	71.5 %	69.5 %	77.5 %
Acrosome (nl shape)	29 %	22 % (approx)	30 %	42.5 %
Axoneme pattern (nl 9+2)	52 %	38.2 %	46.1 %	52.2 %
Axoneme shape (nl)	67.4 %	55.9 %	63.6 %	67.7 %
Nuclear shape (nl)	29 %	20 %	29 %	42.5 %
Fibrous sheath (nl)	44.4 %	42.0 %	33.3 %	40.6 %

Need for *objectivity* to make acupuncture mainstream

- Measurement of Tongue and pulse diagnosis (TCM) is common modality used by the classically trained acupuncture practitioner to treat complex multisystem disorders such as infertility.
- However, it is difficult to become expert in, subjective and foreign to our conventionally trained colleagues. Even to the acupuncture trained Physician treatment is usually based on learned treatment paradigms instead of a TCM diagnosis.
- Without objectivity the Eastern practitioners approach is often viewed as suspect by Western practitioners.
- Goal: **An objective measurement of the Eastern Paradigm which can be readily understood and provide initial and post treatment documentation that can be critically evaluated.**

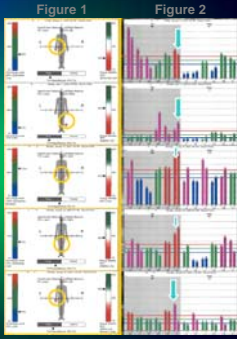
Meridian Measurements: The Science Behind it

- Acupuncture points correspond to high electrical conductance points on the body surface
 - O Bergsman, A Wooley-Hart, Am J Acu, 1:27, 1973
- The high electrical skin conductance is associated with a high density of gap junctions at these acupuncture points
 - JY Fan, Am J Acu, 18:163, 1990
- The electrical charge produced at these acupuncture points creates an electrical field both of which varies with physiologic change and pathogenesis
 - K Saku et al, Clin Cardiol, 16:415, 1993
 - TD Oleson, Pain, 8:217, 1980
- Therefore, measurement of the electrical conductance of these surface acupuncture points might identify pathogenesis and offer insight into the treatment
 - C Shang, Clin Acupuncture: Scientific Basis, Stux & Hammerschlag (Eds) Springer, 2001
- Diagnostic software is available that allows for rapid measurement of the conductance of meridian points and provides recommended treatment protocols based on the 5-element (phase) paradigm or, if preferred by the practitioner, specific Luo, sedation and tonification points to treat.



Meridian Evaluation: Application to Male Fertility

- **Question: Can meridian measurement assist with the diagnosis and acupuncture treatment of the azoospermic male?**
- Methods:
 - 5 Patients with Azoospermia
 - Source points were evaluated
- Results:
 - Distinct patterns emerged
 - All patients were found to have a predominant lower energy balance (Figure 1).
 - All five patients had deficiencies in Qi energy and energy stability (Figure 1).
 - All five patients had an excess in the kidney meridian with 2 of the 5 also having a split kidney meridian (Figure 2).




www.BruceGilbertMD.com/presentations.html

Meridian Evaluation: Application to Male Fertility

- Treatment paradigms had commonality:
 - HT-9 and MH-9 were indicated as part of the treatment protocol for azoospermic patients with spermatogenesis present on biopsy
 - LV-2 was indicated for patients with Germ Cell Aplasia.
 - The most common meridians used for treatment were:
 - 4/5 LV,
 - 3/5 BL, MH, HT, LU, GB, KI, TH, SP, LU
 - 2/5 SI

Take home message:

- Points useful for treatment of male infertility:
 - *Siterman*: LU-7, LI-4, LI-11, ST-30, ST-36, SP-6, SP-9, SP-10, HT-7, BL-20, BL-23, BL-33, KI-6, KI-7, P-6, LV-5, LV-8, CV-1, CV-2, REN-4, CV-6, GV-4
 - *Pei et al*: CV-4, BL-23, BL-32, LV-3, KI-3, ST-36, SP-6, SP-10, ST-29, GV-20
 - Meridian measurements: HT-9, MH-9, LV-2
 - 4/5 (LV)
 - 3/5 (BL, MH, HT, LU, GB, K, TH, SP)
 - 2/5 (SI)



Part 3 Infertility Treatments Acupuncture & IVF Research

Paul C. Magarelli, M.D., Ph.D.
Diane K. Cridennda, L.Ac.




18 Ways to Make a Baby

1. Natural sex
2. Artificial insemination -- of mother with father's sperm
3. Artificial insemination -- of mother with donor sperm
4. Artificial insemination -- with egg and sperm donors, using surrogate mother
5. In vitro fertilization (IVF) -- using egg and sperm of parents
6. IVF -- with Intra-Cytoplasmic Sperm Injection (ICSI)
7. IVF -- with frozen embryos
8. IVF -- with Preimplantation Genetic Diagnosis (PGD)
9. IVF -- with egg donor
10. IVF -- with sperm donor
11. IVF -- with egg and sperm donor
12. IVF -- with surrogate using parents' egg and sperm
13. IVF -- with surrogate and egg donor
14. IVF -- with surrogate and sperm donor
15. IVF -- with surrogate using her egg, sperm from baby's father
16. IVF -- with surrogate using egg and sperm donors*
17. Cytoplasmic transfer**
18. Nuclear transfer and cloning

Western Treatment of Infertility

- **Timed Intercourse**
- Clomid therapy, aka **Ovulation Induction** (can be used with injectable medications also, e.g., Pergonal™)
- **Intrauterine Insemination (IUI)**, aka Artificial Insemination
- **In Vitro Fertilization (IVF)**- "Test Tube Baby"

Timed Intercourse: "natural"

Women: Egg, natural state



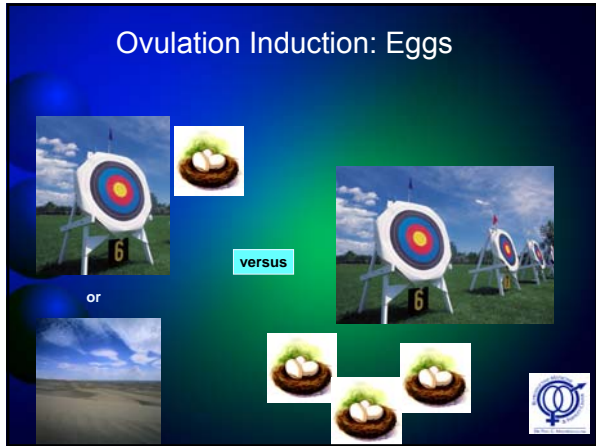

Men: Sperm, natural state



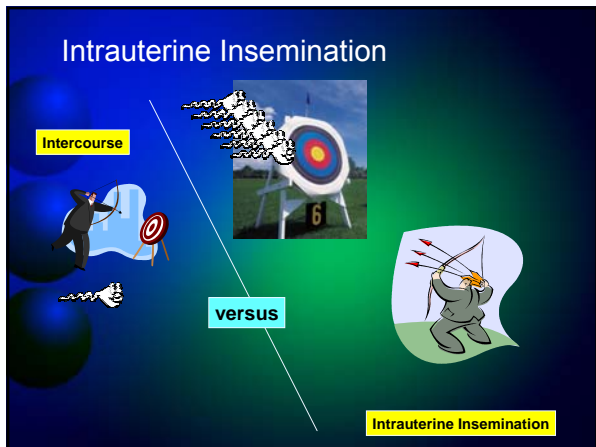

or







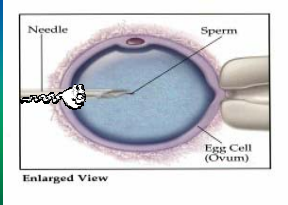




Male Factor Treatments

Intercourse



versus



Needle Sperm Egg Cell (Ovum)

Enlarged View

ICSI



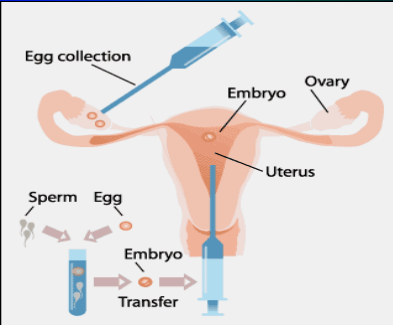
Test Tube Babies = IVF



In vitro means "In Glass" which is another name for "In the Lab"




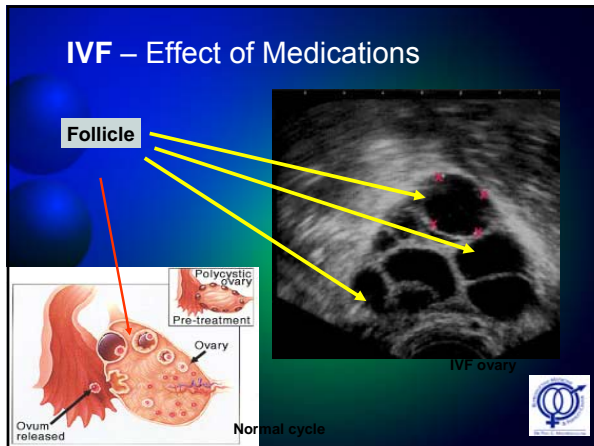
In Vitro Fertilization

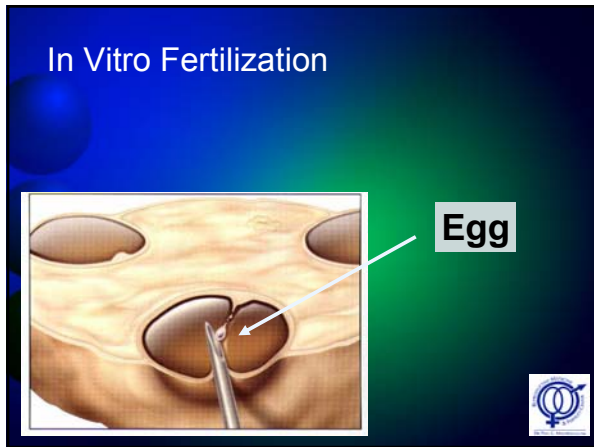


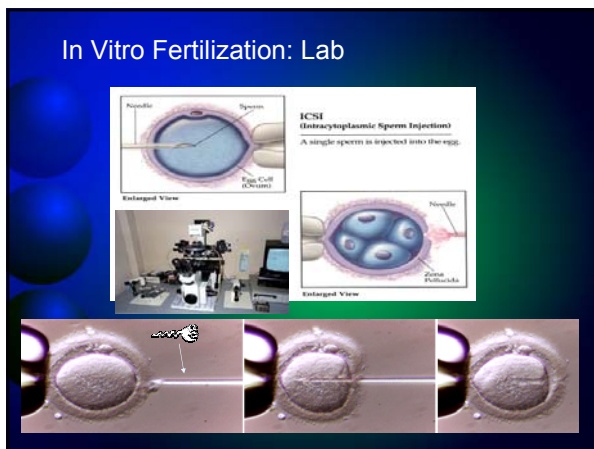
Egg collection Ovary Embryo Uterus

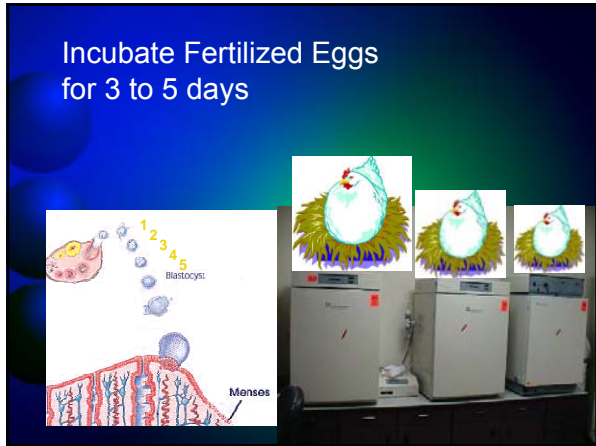
Sperm Egg Embryo Transfer

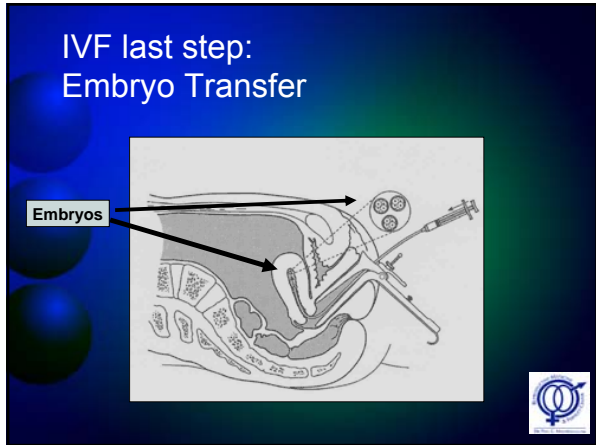


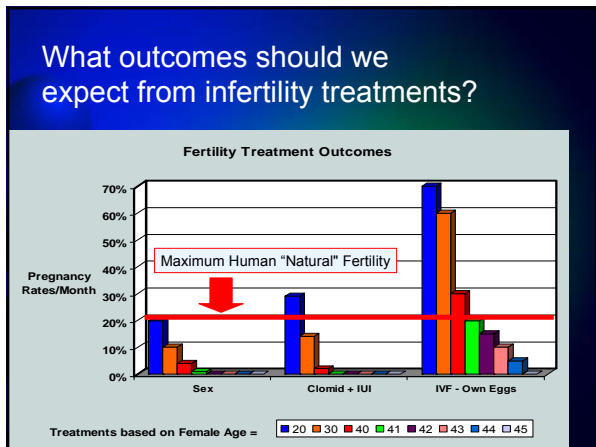












Acupuncture & IVF Research
Diane K. Cridennda, L.Ac.

- Outline Research
- “biology of acupuncture”
- Studies
 - Overview
 - Results
- Impact of Acupuncture on IVF




Traditional Chinese Medicine (TCM)
Diane K. Cridennda, L.Ac.
 East Winds Acupuncture, Inc.



www.EastWindsAcupuncture.com

Acupuncture & IVF



Study Design

- Acupuncture Consortium
 - Agreement (written) to follow protocols
 - Agreement to provide 7 day/wk coverage
 - Agreement that SV and Paulus treatments would have suggested fee
 - Agreement that access to consortium would be through one lead acupuncturist
- All patients would have choice to have acupuncture or not
 - Information provided to IVF patients by physician, nurses, posters and flyers in each exam room
- Investigators would (did not) look at overall data outcomes for 3 years

Key Components of Research

- Two groups
 - Controls – no acupuncture
 - Treatment – acupuncture (one or both protocols)
- IVF procedures
 - One RE&I did all procedures
- Acupuncture procedures
 - Acupuncture Consortium
 - Lead by one Acupuncturist
 - Treatments are reported to Consortium leader for analysis
- Statistical Analysis
 - Performed by independent researcher


Literature


Two major studies were done on the efficacy of acupuncture being used in conjunction with IVF or ART:

1. Reduction of blood flow impedance in the uterine arteries of infertile women with electro-acupuncture Stener-Victorin et al.
 - Eight treatments before retrieval using electro-stim
2. Influence of acupuncture on the pregnancy rate in patients who undergo assisted reproduction therapy. Paulus et al.
 - This was the protocol set up for the pre and post embryo transfer/we modified the protocol slightly


Stener-Victorin et al. Protocol

- **Protocol**
 - Eight treatments before retrieval
 - Treat the patient twice a week for four weeks up to retrieval
- **Point Locations (all points are needled bilaterally)**
 - UB 23 to UB 28 (one lead)
 - SP 6 to UB 57 (one lead)
- **Electro-stimulation set from 0 – 100 Hz for 30 minutes**
 - (AWQ-104 D digital Electro Acupuncture Stimulator)
- **TDP lamp on the low back is optional for the patient (our variation)**
- **Needles**
 - 36 g 1-1 1/2 inch needles
 - Patient has panic button in case e-stimulation stops or gets too strong.







E- Stim Photos




Paulus et al. Protocol

- **Protocol**
 - Treat 12-24 hours before embryo transfer (this was a variation of Paulus protocol)
 - Treat within 1 hour after embryo transfer
- **Pre transfer points**
 - Du 20, PC 6, ST 29, SP 8, LIV 3
 - Ear points
 - Rt. Shen, brain
 - Lt. Uterus, endocrine
 - place press tacks in each ear using the same pattern and ask pt to stimulate them during transfer.
- **Post transfer points**
 - LI 4, SP 10, ST 36, SP 6
 - Ear Points
 - Rt. uterus, endocrine
 - Lt. Shen, brain
 - place press tacks in same pattern instruct patient to remove in 3 days
- **Needles**
 - 32 g 1 1/2 inch needles
 - Stimulate to obtain "de Qi"
 - Re-stimulate after 10 minutes, leave another 15 minutes Total Retention 25 minutes.



Theoretical Basis “biology of acupuncture”
 Acupuncture points in Stener-Victorin Protocol


- UB 23 (kidney shu point)
 - Powerful point which tonifies and regulates the kidneys, affects the low back, regulates whole body
- UB 28 (bladder shu)
 - local points over the uterine arteries, regulates the uterus
- UB 57(supporting mountain)
 - relaxes sinews, invigorates the blood
- SP 6 (three yin crossing or meeting of the yin)
 - all female issues, affects kidneys, liver and spleen



Theoretical Basis “biology of acupuncture”
 Acupuncture points in Paulus Protocol: Pre Embryo transfer

- DU 20 Hundred meetings
 - Any pre and post partum issues, prolapse of any kind
- PC 6 Inner gate
 - Calms heart regulate Qi regulates middle jiao
- SP 8 Earth mechanism
 - Regulates uterus
- ST 29 Coming back
 - Affects ovaries,vagina all female issues
- LIV 3 Bigger rushing
 - Calms the mind, regulates blood, pacifies liver, opens channel calms spasms


all points are needled bilaterally



Theoretical Basis “biology of acupuncture”
 Acupuncture points in Paulus Protocol: Post Embryo transfer



- LI 4 Union of the Valleys
 - Pain in uterus, tonifies and regulates qi
- ST 36
 - Regulates qi and blood, strengthens whole body, treats any weak and deficient conditions
- SP 10
 - Moves and cools the blood, tonifies blood, moves blood (a heparin like affect)
- SP 6
 - Regulates the uterus, calms the mind by relationship to the heart, benefits kidney, liver and spleen. Nourishes yin and blood.

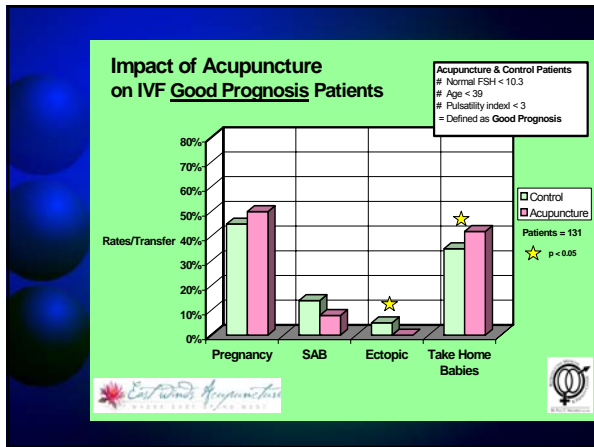
all points are needled bilaterally

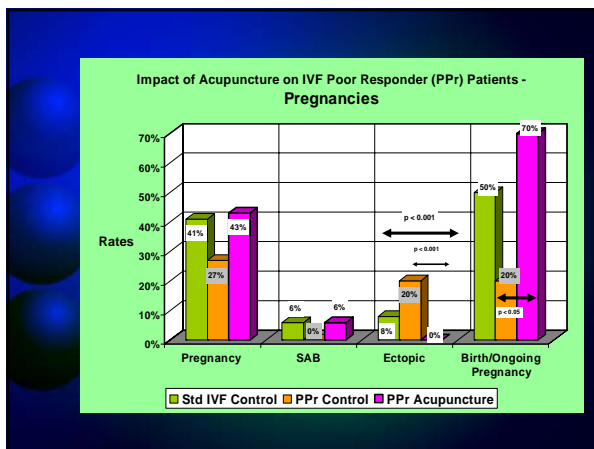


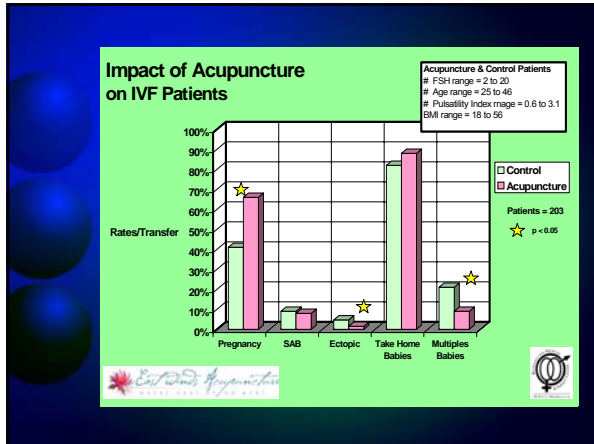
Auricular Acupuncture

- Points
 - Uterus
 - Endocrine
 - Shen Men
 - Brain

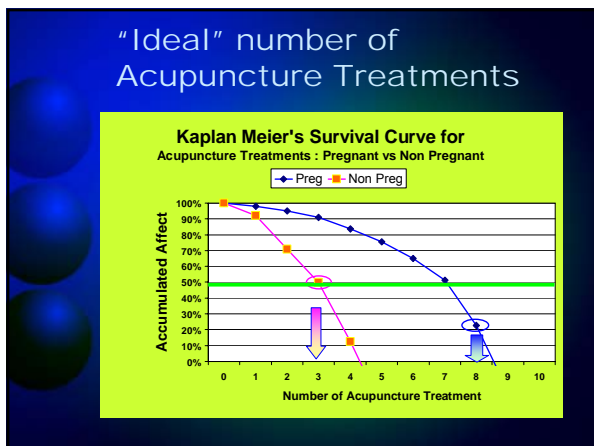









- ### Impact of Acupuncture on IVF Pregnancies:
- Integrating Acupuncture into an IVF program improves reproductive outcomes
 - Fewer Miscarriages
 - Fewer Ectopics
 - More Pregnancies
 - Fewer Multiples
 - More Take Home Babies!
-



Embryology Outcomes: Impact of Acupuncture on Egg & Embryo Characteristics

Pregnant	Ac	Control
Number Eggs Retrieved	14.8	15.7
Number Fertilized Normally	8.9	8.4
Number Implanted	1.6	1.5
Number Frozen	1.6	2.2
Number Embryo Transferred	3.7	3.4
Day of Transfer	3.1	3.2
Number previous IVF cycles	0.6	0.4

Not Pregnant	Ac	Control
Number Eggs Retrieved	12.8	13.1
Number Fertilized Normally	6.9	7.2
Number Implanted	0.0	0.0
Number Frozen	1.3	1.2
Number Embryo Transferred	3.3	3.2
Day of Transfer	3.2	3.2
Number previous IVF cycles	0.5	0.4

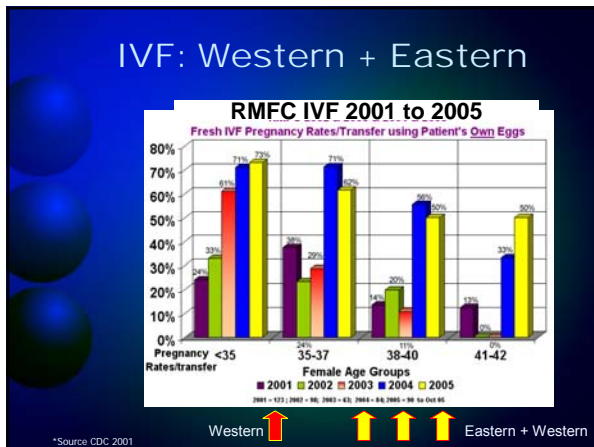
Results: Pregnancy & Embryology

Pregnancy Outcomes were superior in the Acupuncture Group vs. Non-Acupuncture group (p < 0.05)

- Significantly more pregnancies at p ≤ 0.05
- Significantly fewer ectopic pregnancies at p ≤ 0.05

Embryology Outcomes were the same between the Acupuncture Group and the Non-Acupuncture group

- Number Eggs Retrieved
- Number Fertilized Normally
- Number Implanted
- Number Frozen
- Number Embryo Transferred
- Day of Transfer
- Number previous IVF cycles



Other Research

- Impact of Acupuncture on Stress Hormones in IVF patients
 - Results
 - To be discussed...

Time	Control	Progesterone
Time 1	15	15
Time 2	15	15
Time 3	15	15
Time 4	15	15
Time 5	15	15
Time 6	15	15
Time 7	15	15
Time 8	15	15
Time 9	15	15
Time 10	15	25
Time 11	15	20
Time 12	15	15
Time 13	15	15

Conclusions

- Biology of Reproduction
 - Female
 - Male
- Treatment of Infertility – Western Perspective
 - There have been significant improvements in infertility treatments utilizing Western Medicine
- Acupuncture has been shown to enhance and improve fertility for thousands of years
 - Literature supports both primary and adjunctive role of Acupuncture in evaluation and treatments of infertility
 - Research done utilizing Acupuncture in conjunction with IVF has demonstrated improved pregnancy rates, lower miscarriage rates, very low ectopic pregnancy rates, possible reduced multiple pregnancies!
 - Our research demonstrates significant improvements in IVF outcomes and for the first time significant improvements in THB (take home babies)... the REAL desired outcome!

Recommendations

- Discuss Acupuncture for IVF patients
- Develop Acupuncture Consortium
- Work with Reproductive Endocrinologist and Infertility Specialist
- Give patients references related to impact of Acupuncture on IVF outcomes
- Educate patients to seek an acupuncturist who specializes in infertility

Questions?

The composite image includes:

- A diagram of a human back with various acupuncture points labeled in Chinese and English, such as 'Shen Men' (Heart 7), 'Yin Tang' (Bladder 28), and 'Shao Fu' (Bladder 17).
- A circular object with many sharp, radiating spikes, possibly a needle or a specific type of acupoint.
- Three circular objects arranged horizontally, which appear to be cross-sections of needles or specific acupoints.
- A small illustration of two people sitting at a table, possibly representing a traditional medical consultation.
