Into Adolescence and Womanhood A "right" of passage

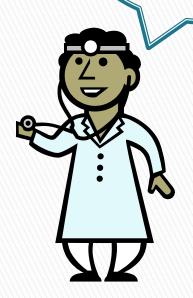
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Differences in attitude



I hope it happens, but not too late.



Why is her growing up hard to accept?

- Fears of the unknown and "what ifs"
 - Pain
 - Managing hygiene
 - Mothers say "Fathers no longer willing to help"
 - Fathers say "What the heck is happening"
 - Seizures
 - Loss of my "little girl"
 - Reminder of life as finite
 - Another specialist/another exam
 - Exploitation

"Knowledge is power. Information is liberating"...

Kofi Annan

Liberating us from our fears

Puberty and Menarche

Puberty hormone driven



makes gonadotropin releasing hormone





makes luteinizing and follicle-stimulating hormone



make estrogen (and testicles make testosterone)







Puberty

- Changes in body composition, growth, bone size and mineralization occur
- Physical changes categorized by Tanner stages (I-V)
- Timeline from start of Tanner II to menarche → approximately 4 years

Factors affecting onset

- Biologic
 - Race
 - Nutrition/% body fat/activity level
 - Genetics
 - Medications
 - Anatomic/physiologic abnormalities
 - Chemical exposure
 - Preexisting conditions
- Psychologic/Social
 - Stress

Puberty in Rett Syndrome Natural History Study Data 2013

◆US girls with RTT achieve Tanner II averages Breast 9.3 years +/- 1.81 years¹ Pubic hair 8.79 years +/- 1.69 years¹

compared to general US population average age 9.96 ± 1.8 years

Pubertal growth spurt absent in RTT²

- 1 Unpublished data based on 248 females in NHS
- 2 Tarquinio et al. Neurology October 16, 2012 vol. 79 no. 16 1653-1661

Precocious puberty

- Changes too early
 - Know norms for RTT
- Breast growth, menstruation, pubic or underarm hair, rapid growth, acne, body odor
- Causes depend on type central or peripheral
- Risk factors
 - Female
 - African American
 - Obese
 - Exposure to sex hormones supplements, creams
 - Other medical conditions

Precocious Puberty Definitions Non-Rett females

- African American → Breast or public hair <6 yrs
- Caucasian → Breast or pubic hair <7 yrs
- All → Breast and public hair <8 yrs

Precocious puberty

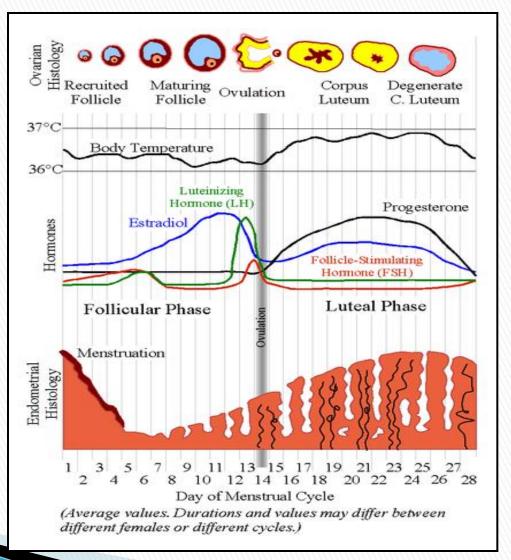
- May result in short height
- Endocrinologist visit
 - Review history and exam
 - Blood test
 - Gn–RH
 - thyroid
 - Xray of wrist and hand
 - MRI
- Treatment
 - Central type Lupron monthly injections until reaches normal age for puberty

Menarche

- Marked by start of menstrual cycle usually in Tanner IV
- Influenced by body fat
 - 17% BF required to begin menstruation and 22% BF to maintain¹
- Variable experiences

1 American Academy of Pediatrics and Committee on Sports Medicine and Fitness. Pediatrics. 2000;106:610

Menstrual Cycle



Menarche and Rett Syndrome (RTT) Natural History Study Data - 2013¹

- Mean (average) age of menarche
 RTT = 12.14 years¹
 Non RTT US = 12.5 years²
 Non RTT Canada = 12.72 years³

1 Unpublished data

2 Anderson SE et al. Pediatrics 111(4 Pt 1): 844-50

3 http://www.ncbi.nlm.nih.gov/pubmed/21110899

Related Issues of Menstruation

- Discomfort PMS/Cramps even prior to menarche
 - Behavior clues
 - Violence/aggression/self-abuse
 - Crying/Tantrums
 - Restlessness
 - Irritability
 - Change in socialization
 - Meds, warm packs, baths and massage
- Hygiene
 - Pads and tampons
 - Menstrual flow is odorless until it comes in contact with air and bacteria
 - Bathing and meticulous personal care essential
- Seizures

- Share responsibility just like always
- Biologic function
- No accusations just because of Tanner stage
- Same child as the day before
- Everyone needs you as much as ever
- Don't use as an excuse
- Single dads

- Breast development
 - Bra types

Periods

- Last anywhere from 2-7 days, average 5 days.
- Repeat on average every 28 days ("the menstrual cycle") but can repeat anywhere from 21 to 35 days.
- Can be sporadic and unpredictable
- Usually irregular for 1st couple of years

- Sanitary products Keep array on hand
 - Pantyliners for light flow
 - Regular sanitary napkins for heavier days/nights
 - What are wings??
 - Night pads, for bedtime or really heavy periods
 - Wrap in paper to discard in garbage
 - Tampons
 - Read insert for placement
 - Swimming
 - Toxic Shock Syndrome

- Hygiene
 - Change pads min of every 4 hours during the day
 - Can add to diaper
 - Send products to school
 - Baths are good!
 - Deodorant on your "sweet" girl
- Don't be embarrassed to ask for help
 - Fathers on RettNet
 - Web-based Father's only sites
 - Female buddies
 - School nurses

Variants in development

- Thelarche breast development
 - Premature < 1 year, but may be benign
 - Delayed no development by age 13 years
- Pubarche pubic hair growth
 - Premature < 7 yrs in Caucasian/< 6 yrs in African American
 - Delayed > 13.5 yrs
- Menarche menstruation
 - Premature < 9 yrs cause for discussion/evaluation
 - Delayed if > 3 yrs beyond thelarche or ≥ 15
 yrs →primary amenorrhea

Where can things go wrong?

Brain - pituitary or hypothalamus

↓
Thyroid
↓
Adrenals
↓
Ovaries
↓

Reproductive tract – uterus or vagina

"THAT" behavior that causes parental angst

- Wanting to duplicate "good feeling" is normal
- Medications (SSRIs) may be helpful option
- As receptive language ability matures, begin basic message
 - Private behavior to be done in a private area
 - Will provide private time and space when possible
 - When not possible, acknowledge, remind and redirect CALMLY
 - May require consistent repetition and reinforcement
 - Avoid negative remarks/actions

Factors to consider

- Physical causes
 - Poor hygiene
 - Irritating or tight clothing
 - Rashes, UTI, vaginal irritant or STD
- Evaluate medications
 - Some have these side effects
- Assess lifestyle
 - Boredom
 - No private time
- Analyze private space and opportunity



As she matures....

- Become comfortable yourself
- Talk to your daughter about what is happening to her body
- Find a physician/NP who is comfortable
- Neep a diary to note patterns

Medications and Procedures for Menstrual Management and Birth Control

Menstrual Management and Birth Control- a very personal decision

- Let nature take *her* course
- Hormonal methods
 - Oral Contraceptives/Birth Control Pills
 - Depo-Provera injection
 - Topical skin patch
 - Vaginal rings
 - Intrauterine device (IUD)
- Surgical methods
 - ▶ Endometrial ablation
 - Hysterectomy

Why consider menstrual management?

- Hygiene
- Comfort
- Safety
- Health conditions that are exacerbated by hormonal cycle, such as seizures

Hormonal Method	What it is and why it is used	Other considerations
Oral contraceptives Types: Combination: 21-28 day - long list 90 day - Seasonale® Seasonique® 326 day - Lybrel® Progestin only "Mini pill"	 Pills containing varying levels of synthetic estrogen and/or progesterone 21, 28, 90, or 365 days administration Given daily by caregiver Used to regulate periods, reduce cramping or heavy menstrual flow, protect against pregnancy, or stop hormone fluctuations that cause seizures 	Pros: •Well-understood •Improves bone density •Decreases cancer risk Cons: •Increased risk of deep vein thrombosis (blood clot) in non- ambulatory •Nausea, vomiting, headaches, weight gain, irregular bleeding, hypertension

List of Combination Oral Contraceptives

- Alesse® (containing Ethinyl Estradiol, Levonorgestrel)
- Apri® (containing Desogestrel, Ethinyl Estradiol)
- Aranelle® (containing Ethinyl Estradiol, Norethindrone)
- Aviane® (containing Ethinyl Estradiol, Levonorgestrel)
- Azurette® (containing Desogestrel, Ethinyl Estradiol)
- Balziva® (containing Ethinyl Estradiol, Norethindrone)
- Beyaz® (containing Drospirenone, Ethinyl Estradiol, Levomefolate)
- Brevicon® (containing Ethinyl Estradiol, Norethindrone)
- Cesia® (containing Desogestrel, Ethinyl Estradiol)
- Cryselle® (containing Ethinyl Estradiol, Norgestrel)
- Cyclessa® (containing Desogestrel, Ethinyl Estradiol)
- Demulen® (containing Ethynodiol, Ethinyl Estradiol)
- Desogen® (containing Desogestrel, Ethinyl Estradiol)
- Enpresse® (containing Ethinyl Estradiol, Levonorgestrel)
- Estrostep® Fe (containing Ethinyl Estradiol, Norethindrone)
- Femcon® Fe (containing Ethinyl Estradiol, Norethindrone)
- Gianvi® (containing Drospirenone, Ethinyl Estradiol)
- Jolessa® (containing Ethinyl Estradiol, Levonorgestrel)
- Junel® (containing Ethinyl Estradiol, Norethindrone)
- Kariva® (containing Desogestrel, Ethinyl Estradiol)
- Kelnor® (containing Ethynodiol, Ethinyl Estradiol)
- Leena® (containing Ethinyl Estradiol, Norethindrone)
- Lessina® (containing Ethinyl Estradiol, Levonorgestrel)
- Levlen® (containing Ethinyl Estradiol, Levonorgestrel)
- Levlite® (containing Ethinyl Estradiol, Levonorgestrel)
- Levora® (containing Ethinyl Estradiol, Levonorgestrel)
- Lo/Ovral® (containing Ethinyl Estradiol, Norgestrel)
- Loestrin® (containing Ethinyl Estradiol, Norethindrone)
- Loestrin® Fe (containing Ethinyl Estradiol, Norethindrone)
- LoSeasonique® (containing Ethinyl Estradiol, Levonorgestrel)
- Low-Ogestrel® (containing Ethinyl Estradiol, Norgestrel)
- Lutera® (containing Ethinyl Estradiol, Levonorgestrel)
- Lybrel® (containing Ethinyl Estradiol, Levonorgestrel)
- Microgestin® (containing Ethinyl Estradiol, Norethindrone)
- Microgestin® Fe (containing Ethinyl Estradiol, Norethindrone)
- Mircette® (containing Desogestrel, Ethinyl Estradiol)
- Modicon® (containing Ethinyl Estradiol, Norethindrone)
- MonoNessa® (containing Ethinyl Estradiol, Norgestimate)
 - Necon® 0.5/35 (containing Ethinyl Estradiol, Norethindrone)
 - Necon® 1/50 (containing Mestranol, Norethindrone)

- Nordette® (containing Ethinyl Estradiol, Levonorgestrel)
- Norinyl® 1+35 (containing Ethinyl Estradiol, Norethindrone)
- Norinyl® 1+50 (containing Mestranol, Norethindrone)
- Nortrel® (containing Ethinyl Estradiol, Norethindrone)
- Ocella® (containing Drospirenone, Ethinyl Estradiol)
- Ogestrel® (containing Ethinyl Estradiol, Norgestrel)
- Ortho Tri-Cyclen® (containing Ethinyl Estradiol, Norgestimate)
- Ortho Tri-Cyclen® Lo (containing Ethinyl Estradiol, Norgestimate)
- Ortho-Cept® (containing Desogestrel, Ethinyl Estradiol)
- Ortho-Cyclen® (containing Ethinyl Estradiol, Norgestimate)
- Ortho-Novum® 1/35 (containing Ethinyl Estradiol, Norethindrone)
- Ortho-Novum® 1/50 [DSC] (containing Mestranol, Norethindrone)
- Ovcon® (containing Ethinyl Estradiol, Norethindrone)
- Portia® (containing Ethinyl Estradiol, Levonorgestrel)
- Previfem® [DSC] (containing Ethinyl Estradiol, Norgestimate)
- Quasense® (containing Ethinyl Estradiol, Levonorgestrel)
- Reclipsen® (containing Desogestrel, Ethinyl Estradiol)
- Safyral® (containing Drospirenone, Ethinyl Estradiol, Levomefolate)
- Seasonale® (containing Ethinyl Estradiol, Levonorgestrel)
- Seasonique® (containing Ethinyl Estradiol, Levonorgestrel)
- Solia® (containing Desogestrel, Ethinyl Estradiol)
- Sprintec® (containing Ethinyl Estradiol, Norgestimate)
- Sronyx® (containing Ethinyl Estradiol, Levonorgestrel)
- Tilia® Fe (containing Ethinyl Estradiol, Norethindrone)
- Tri-Legest® Fe (containing Ethinyl Estradiol, Norethindrone)
- TriNessa® (containing Ethinyl Estradiol, Norgestimate)
- Tri-Norinyl® (containing Ethinyl Estradiol, Norethindrone)
- Triphasil[®] (containing Ethinyl Estradiol, Levonorgestrel)
- Tri-Previfem® [DSC] (containing Ethinyl Estradiol, Norgestimate)
- Tri-Sprintec[®] (containing Ethinyl Estradiol, Norgestimate)
- Trivora® (containing Ethinyl Estradiol, Levonorgestrel)
- Velivet® (containing Desogestrel, Ethinyl Estradiol)
- Yasmin® (containing Drospirenone, Ethinyl Estradiol)
- Yaz[®] (containing Drospirenone, Ethinyl Estradiol)
- Zenchent® (containing Ethinyl Estradiol, Norethindrone)
- Zovia® (containing Ethynodiol, Ethinyl Estradiol)

Hormonal Method	What it is and why it is used	Other considerations
Contraceptive Patch (Ortho-Evra®)	 Patch of synthetic estrogen and progesterone Placed on lower abdomen, upper arm, buttocks or torso Replaced weekly Periods every month Used to regulate periods, reduce cramping or heavy menstrual flow, protect against pregnancy, or stop hormone fluctuations that cause seizures 	•Long-term health affects not studied in developmental disorders (DD) •Increased risk of deep vein thrombosis (blood clot) in non-ambulatory •60% more estrogen exposure •Reduced effectiveness in >198 pounds •Reports of those with DD removing prematurely •Skin reactions

Hormonal Method	What it is and why it is used	Other considerations
Levonorgestrel IUD (Mirena®)	 Progestin released by device place in uterus Effective for 5 years Can be used to reduce blood loss and pain associated with menstruation, in addition to preventing pregnancy. 	 •Must be inserted by physician •May need sedation for GYN exam and insertion •Risk of uterine perforation •Insertion may be difficult and painful in those who have not had children •Risk of infection if sexually active •Regular string checking for placement

Hormonal Method	What it is and why it is used	Other considerations
Depo-Provera®	 Injection of Progestin Given every 3 months in buttocks or arm Used to regulate periods, protect against pregnancy 	 Must be given by RN or MD Reduces bone density not recommended for RTT Can cause heavy, irregular bleeding Can cause significant behavior changes Can cause significant weight gain Long-term effects in DD not known

Hormonal Method	What it is and why it is used	Other considerations
Vaginal Rings (NuvaRing®)	 "Self" – inserted vaginal ring changed once a month Combination estrogen and progesterone Birth control but monthly menstruation and uncertain reduction of menstrual flow 	 Pros: •Not a daily pill Cons: •Dependent on others for insertion •Same risks as combination BCP •Vaginal infections, increased discharge, and irritations

Deep Vein Thrombosis Risks and Contraceptive Considerations

*WHO US Medical Eligibility Criteria for Contraceptive Use - 2010

TYPE	RECOMMENDATION Surgery with prolonged immobilization (ie in a wheelchair)	RECOMMENDATION Surgery without prolonged immobilization (ie "ambulatory")
Combined OC, patch, ring	Unacceptable health risk	Advantages generally outweigh risks
Progestin only pills, depo provera, implants	Advantages generally outweigh risks	No restriction
IUD (levonorgestrel- releasing/LNG and copper)	LNG - Advantages generally outweigh risks Copper – No restriction	No restriction for both

Surgical methods

Hormonal Method	What it is and why it is used	Other considerations
Endometrial Ablation	 Outpatient procedure Endometrial lining is purposely removed or destroyed Methods include laser, heat, electricity freezing, or radio waves Local, spinal or general anesthesia Used to decrease menstrual flow 	 Pros: Short recovery May result in permanent stop of menstruation Cons: May result in permanent changes in uterine anatomy Risk of lacerations and burns Usual surgical risks

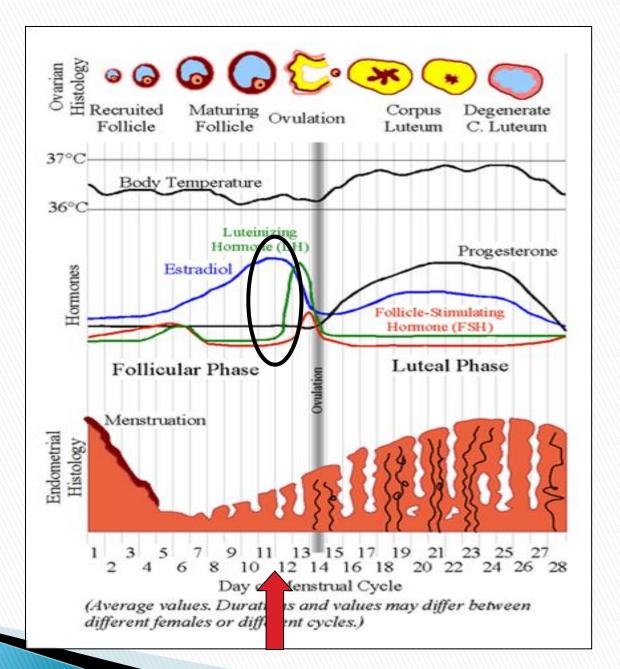
Surgical methods

Hormonal Method	What it is and why it is used	Other considerations
•Total – uterus and cervix, +/- ovaries •Subtotal – uterus only •Complete – uterus, cervix, ovaries, and fallopian tubes •Radical – uterus, cervix, upper vagina, and parametrium. Often includes lymph nodes, ovaries and fallopian tubes	 Inpatient procedure General anesthesia Techniques variable Abdominal Mini Laparotomy Vaginal Laparoscopy 	Pros: •Permanent and complete •Uncomplicated management after initial procedure •Decreases cancer risk dependent on extent of procedure Cons: •Major surgery risks •Significant recovery time •DVT risk increases if immobile post op •May be difficult and costly medical/legal process

Hormones, Seizures, and Antiepileptic Medications

Relationship Between Seizures and Hormones

- Hormones influence seizure occurrence
 - Estrogen excitatory affect on brain cells
 - Progesterone inhibitory affect on brain cells
- Seizures associated with ovulation or menstruation are called *catamenial epilepsy* and are caused by hormone fluctuations



Seizures and Womanhood

- Seizures may increase during puberty
 - Hormone fluctuations
 - Sleep disruption
 - Antiepileptic drug blood levels may be adversely affected by
 - Fluid retention
 - Rapid weight gain
 - Oral contraceptives
- Women with epilepsy are 4-7 times more likely to have irregular cycles
- Seizure and menstrual cycle diary

Catamenial Epilepsy Treatment Options

- Adjusting existing seizure medications during cycle
- Intermittent perimenstrual medications
 - clonazepam (0.05-0.1mg/kg/day) or clobazam (5-10mg/day; up to 30mg/day)
- Hormonal manipulation aimed at increasing progesterone
 - Progesterone (days 10–26 of cycle)
 - Combination oral contraceptive (estrogen AND progestin)
- Diuretics
- Sleep medications

Effects of Oral Contraceptives on Antiepileptic Medications

- ▶ Decreases levels of Lamictal™/lamotrigine
 - May result in increased seizures
 - Higher doses of lamotrigine may be required
 - May experience large fluctuations of lamotrigine between OC active/placebo phase
- Increases levels of Dilantin ™ /phenytoin
 - Toxicity
 - Drug levels after estrogen therapy begun
- No effect on Depakote ™ /valproate and Tegretol ™ /carbamazepine

Effects of Antiepileptic Medications on Oral Contraceptives

- These AED's increase breakdown of contraceptives, making them less effective
 - Tegretol reg or XR/carbamazepine
 - Carbatrol/oxcarbazepine
 - Dilantin/phenytoin
 - Topamax/topiramatePhenobarbital

 - Mysoline/primodone
- These AEDs have no effect on contraceptives
 - Depakote/valproate
 - Lamictal/lamotrigine
 - Keppra/levetiracetam
 - Gabatril/tiagabine
 - Felbatol/felbamate
 - Neurontin/gabapentin

Menopause and Aging

Menopause

- Average age on onset 51 years (40– 65)
- Anecdotal reports with RTT suggest early aging in appearance, but unsure of impact on age of menopause
- Changes that occur
 - Ovaries stop making estrogen
 - Change in periods 1st sign until they stop
- Periods stop pathology or menopause?

Menopause and Seizures

- Menopause generally occurs significantly earlier in women with high seizure frequency
- Reports of seizures during menopause vary
 - 40% report worsening seizures
 - 27% report improvement of seizures
 - 33% report no change
- Hormone replacement therapy associated with increase in seizures (more in those with catamenial epilepsy)
- In RTT, seizures diminish and EEG's tend to improve as women grow older

Health Maintenance and GYN exams

Breast Health

Considerations

- Family history
- Living environment residential or home care

Signs of problem

- Lump or hard, flat area on breast
- Nipple changes and/or discharge
- Change in size, contour, texture, or temperature
- Swelling in armpit

Breast exams

Monthly "at home" exam; Annual physician exam; Mammography? tolerability

GYN Problems

- Infection/Vaginitis non specific
 - Fecal source
 - Hygiene
 - Bubblebaths
 - Pinworms
 - Masturbation
 - Abuse
- Infection/Vaginitis specific
 - Intestinal bacteria
 - Yeast
 - STD's

GYN Problems

- Vaginal bleeding
 - Precocious puberty
 - Trauma
 - Vulvo-vaginitis
 - Foreign body tampon
 - Urethral prolapse
 - Bleeding disorder
 - Tumor/polyp/fibroid
- Amenorrhea
 - Primary r/o structural abnormality
 - Secondary r/o pregnancy
- Carcinoma

Human Papillomavirus (HPV) to vaccinate or not vaccinate?

- Why? HPV is most common cause of cervical cancer
- When? HPV is transmitted during intercourse, including non-consensual
- What? Cervarix™ and Gardasil™ vaccines
- Who? Preteen girls 11-12 yrs; 13-26 yrs if didn't receive as a preteen
- ▶ How? Given as shots; 3 doses over 6 months
- Why consider when not sexually active?
 Sexual abuse

Gynecological Exams In Special Populations: *a conundrum*

- Equal rights protection all individuals should be treated equally
 - American College of Obstetrics and Gynecology doesn't distinguish between care of those with and without developmental delays
- Practical application not necessary if not sexually active
 - Reluctant to subject her to the discomfort

Pelvic exam

- Pelvic exam exam of female organs
 - Speculum exam looks into the vagina
 - Cells can be collected from the cervix (Pap Smear).
 - Discharges from the cervix / vagina can be collected to look for infection.
 - Bimanual exam gentler, but less effective to see
 - All of the above PLUS feels for abnormalities of uterus, ovaries, vagina, cervix and sometimes rectum
 - Alternative positions rather than stirrups
 - Can perform PAP without speculum

PAP smear

- Specific part of a gynecological "pelvic exam"
- Involves gentle scraping of the cells of the cervix.
 - cells are send it to the lab for examination under the microscope to check for abnormal changes.
- It is a screening test for cervical cancer or precancerous change of the cervix.
- Blind brush cervical smear less traumatic than scrapping and doesn't require speculum

New Guidelines for PAP ACS and USPSTF March 2012

- 21–29 years
 - PAP every 3 years and no HPV test unless abnormal PAP
- 30 65 years
 - PAP and HPV test every 5 years <u>OR</u>
 - PAP alone every 3 years
- Less than 21 years and Over 65 years
 - No PAP or HPV test
- After hysterectomy with no hx of cervical cancer
 - No PAP
- Those who have had HPV vaccine
 - Follow above recommendations
- High risk -DES exposure, organ transplant, HIV
 - May require more frequent

Preparing for pelvic exam

- Anticipate questions
 - Period calendar and description of cycles
 - Medications
 - Write down questions
- Prepare your daughter
- Insist you be allowed to stay
- Ask for alternative positioning
- Sedatives (for her, not you)
- Consider other options
 - Ultrasound
 - Blind brush by bimanual exam

Sexual Abuse

Exploitation and abuse occurs twice as often in those with developmental disabilities

Adults with developmental disabilities are 4-10 times more likely to be abused than other adults

Over 90% of abusers will be people you know, trust, and regularly encounter

Who could do such a terrible thing?¹

- Natural family 16.8%
- Step family 2.2%
- Acquaintances
 - Neighbors and family friends 15.2%
 - Informal paid services "baby sitters" 9.8%
- Strangers 8.2%
- Service providers 44%
 - Direct care staff
 - Personal care attendants
 - Psychiatrists

Parental Roles and Responsibilities You are her protector

- NO ONE THINKS IT CAN HAPPEN TO THEM
 - "She is ALWAYS with us"
- Teach her what is acceptable and what is not
- Ask questions and encourage her to "tell"
- Don't be so afraid that you ignore the signs
 - Physical and psychological
- Follow your instincts and take action
 - · remove, report, seek care, document everything

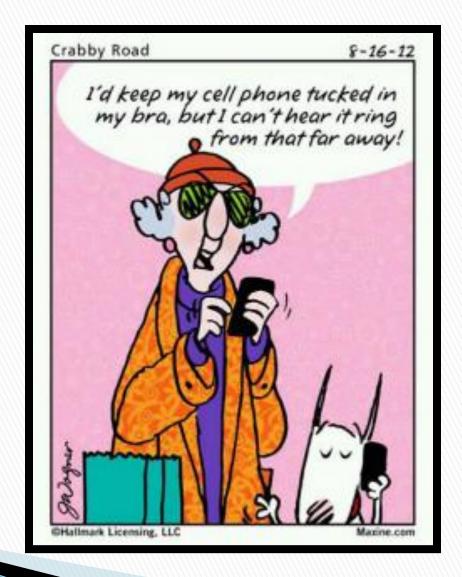
Healthy thinking about maturation

- Realization that physical maturation is NORMAL
- Recognition of her full potential as a maturing individual
- Recognition of normal from abnormal
- Keeps her healthy and safe from abuse

Fear list

- **≻**Manageable
 - ✔ Pain
 - ✔ Hygiene
 - Seizures
 - ✓ Another specialist/another exam
- **≻**Work in progress
 - ✓ Mother fears of no help/Father fears of unknown
 - Reminder of life as finite
 - Safety for no exploitation

Questions?



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