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HUMAN PAPILLOMAVIRUS



- VIRUS THAT CAUSES SKIN OR MUCOUS MEMBRANE GROWTHS (WARTS)
- THERE ARE OVER 100 VARIETIES OF HPV
- SOME TYPES CAUSE WARTS, SOME TYPES CAUSE DIFFERENT FORMS OF CANCER
- INFECTIONS ARE TRANSMITTED SEXUALLY OR THROUGH SKIN TO SKIN CONTACT

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SYMPTOMS OF HPV

- IN MOST CASES, THE IMMUNE SYSTEM DEFEATS HPV INFECTION BEFORE IT CREATES WARTS
- WHEN WARTS DO APPEAR, THEY VARY IN APPEARANCE ACCORDING TO WHICH HPV TYPE IS INVOLVED
 - **GENITAL:** SMALL AND FLAT, CAULIFLOWER LIKE BUMPS. NO PAIN, BUT CAN ITCH/ FEEL TENDER :
 - FEMALE – VULVA, ANUS, CERVIX AND VAGINA
 - MALE – PENIS, SCROTUM AND ANUS
 - **COMMON:** ROUGH AND RAISED. USUALLY ON HANDS/FINGERS. UGLY AND CAN BE PAINFUL- SUSCEPTIBLE TO INJURY
 - **PLANTAR:** HARD, GRAINY GROWTHS ON HEELS OR BALLS OF FEET. UNCOMFORTABLE AND PAINFUL
 - **FLAT:** FLAT TOPPED, SLIGHTLY RAISED LESIONS. OFTEN ON FACE, BEARD, LEGS

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CAUSES OF HPV

- INFECTION OCCURS WHEN THE VIRUS ENTERS THE BODY THROUGH A CUT OR SMALL TEAR IN THE SKIN (SKIN TO SKIN CONTACT)
- GENITAL INFECTIONS ARE CONTRACTED THROUGH SEXUAL INTERCOURSE, ANAL SEX, AND GENERAL SKIN TO SKIN CONTACT IN THE GENITAL REGION
- SOME HPV INFECTIONS THAT RESULT IN ORAL OR UPPER RESPIRATORY LESIONS ARE CONTRACTED THROUGH ORAL SEX
- PREGNANT WOMEN WITH HPV HAVE A SMALL CHANCE OF PASSING THE INFECTION ON TO THE BABY. LESIONS ARE COMMONLY NON-CANCEROUS AND FOUND IN THE BABY'S VOICE BOX

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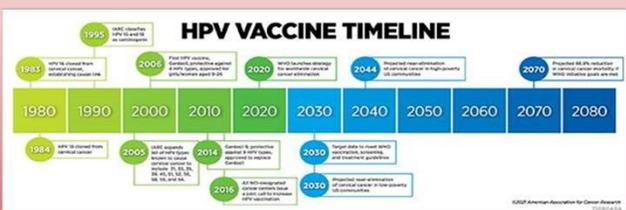
HPV INFECTION

- MOST COMMON STI WORLDWIDE
- OVER 40 HPV TYPES SPREAD BY SEXUAL CONTACT
- 2 TYPES CAUSE GENITAL WARTS
- ABOUT 1 DOZEN CAUSE CANCERS OF THE CERVIX, ANUS, OROPHARYNX, PENIS, VULVA, AND VAGINA



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HPV VACCINE TIMELINE



1980 HPV is linked from cervical cancer

1984 HPV is linked from genital warts

1995 HPV causes 90% of all cervical cancer

2000 First HPV vaccine, Gardasil, prevents 90% of genital HPV types responsible for 90% of cervical cancer

2006 HPV vaccine approved for use in males

2014 Gardasil 9, protective against 9 HPV types, approved for males and females

2016 All 9 HPV types responsible for 90% of cervical cancer and 90% of anal cancer are preventable

2020 WHO launches strategy for accelerated control of HPV and cervical cancer

2030 Target date to meet WHO's ambitious goal to reduce HPV-related cancer deaths by 75%

2044 Potential non-steroidal HPV vaccine approved for high-quality, all-cause prevention

2070 Potential 90% HPV reduction in cervical cancer deaths and 90% reduction in genital warts

2080 Potential non-steroidal HPV vaccine approved for all-cause prevention

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HOW DO THE VACCINATIONS WORK?



- VACCINES STIMULATE THE BODY TO PRODUCE ANTIBODIES THAT, IN FUTURE HPV ENCOUNTERS WITH HPV, BIND TO THE VIRUS AND PREVENT IT FROM INFECTING CELLS
- VACCINES ARE BASED ON VLP'S (VIRUS LIKE PARTICLES) THAT ARE FORMED BY HPV SURFACE COMPONENTS
 - VLP'S ARE NOT INFECTIOUS BECAUSE THEY DO NOT CONTAIN THE VIRAL DNA
- VLP'S CLOSELY RESEMBLE THE NATURAL VIRUS THUS INITIATE GOOD PROTECTIVITY TO THE NATURAL HPV VIRUS
- VLP'S ARE STRONGLY IMMUNOGENIC, MEANING THEY PRODUCE HIGH LEVELS OF ANTIBODY PRODUCTION.

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RECAP

- VLP'S = STRONGLY EFFECTIVE VACCINE

HOWEVER!

- HPV VACCINATION DOES **NOT** PREVENT OTHER STI'S
- HPV VACCINE DOES **NOT** TREAT EXISTING HPV INFECTIONS OR HPV CAUSED DISEASE



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CURRENT VACCINES AVAILABLE

WHAT THEY PROTECT AGAINST
(WHY THE VACCINE IS IMPORTANT)



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3 VACCINES AVAILABLE WORLDWIDE

- GARDASIL
- GARDASIL 9
- CERVARIX

- SINCE 2016, **ONLY** GARDASIL IS AVAILABLE IN THE US

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GARDASIL 9

PREVENTS INFECTION OF 9 HPV TYPES

HPV 6 & 11

CAUSE 90% OF GENITAL WARTS

HPV 16 & 18

HIGH RISK HPV'S THAT CAUSE 70% OF CERVICAL CANCERS AND HIGH PERCENTAGE OF OTHER HPV CANCERS

HPV 31, 33, 45, 52 & 58

HIGH RISK HPV'S THAT CAUSE AN ADDITIONAL 10-20% OF CERVICAL CANCERS

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VACCINE SIDE EFFECTS

- SORENESS, REDNESS, OR SWELLING AT THE INJECTION SITE
- FEVER OR HEADACHE AFTER VACCINATION
- TEENAGERS ARE MORE LIKELY TO FAINT AFTER ANY VACCINATION
- VERY REMOTE CHANGE OF CAUSING A SEVERE ALLERGIC REACTION, OTHER SERIOUS INJURY OR DEATH

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WHO SHOULD BE VACCINATED?

- VACCINE RECOMMENDATIONS ARE MADE BY THE CDC ADVISORY COMMITTEE OF IMMUNIZATION PRACTICES (ACIP)
- AGES 9-26
 - RECOMMENDATION IS FOR ALL PERSONS IN THIS AGE GROUP NOT PREVIOUSLY VACCINATED
 - CAN START AT AGE 9, BUT ROUTINELY STARTED AT AGES 11-12
- AGES 27-45
 - CAN DISCUSS WITH PATIENT IF NOT ALREADY VACCINATED.
 - PROVIDES LESS BENEFIT AS MOST HAVE ALREADY BEEN EXPOSED.

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HOW MANY DOSES?



- BEFORE AGE 15
 - 2 DOSES – AT LEAST 6 MONTHS APART
- 15 AND OLDER OR IMMUNOCOMPROMISED
 - 3 DOSES TO BE FULLY IMMUNIZED
 - 4 WEEKS BETWEEN DOSE 1 AND 2
 - AT LEAST 12 WEEKS BETWEEN DOSE 2 AND 3
 - INTERVAL BETWEEN DOSE 1 AND 3 HAS TO BE AT LEAST 5 MONTHS

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HOW EFFECTIVE ARE THE VACCINES?

STUDIES SHOW THAT THE VACCINES ARE HIGHLY EFFECTIVE IF GIVEN BEFORE 1ST EXPOSURE

TRIALS THAT LED TO APPROVAL OF GARDASIL 9 FOUND THE FOLLOWING:

- NEARLY **100%** EFFECTIVE IN PREVENTING CERVICAL, VULVAR, AND VAGINAL INFECTIONS IN ALL TYPES THAT IT TARGETS
- NEARLY **100%** EFFECTIVE IN PREVENTING PRE-CANCERS IN ALL TYPES THAT IT TARGETS



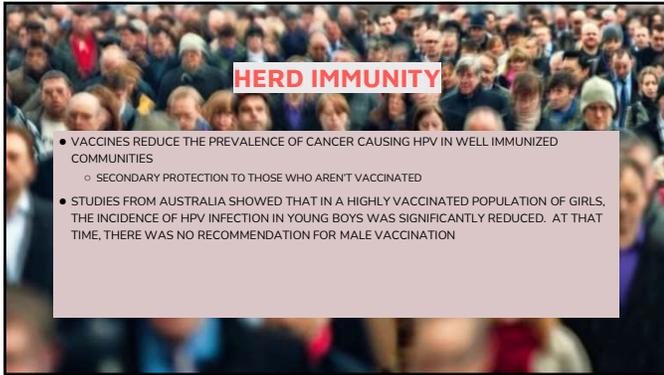
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VACCINE + CERVICAL CANCER SCREENING PROVIDES THE GREATEST PROTECTION AGAINST CERVICAL CANCER

ALSO REDUCES CANCERS CAUSED BY HPV AT SITES OTHER THAN THE CERVIX

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HERD IMMUNITY

- VACCINES REDUCE THE PREVALENCE OF CANCER CAUSING HPV IN WELL IMMUNIZED COMMUNITIES
 - SECONDARY PROTECTION TO THOSE WHO AREN'T VACCINATED
- STUDIES FROM AUSTRALIA SHOWED THAT IN A HIGHLY VACCINATED POPULATION OF GIRLS, THE INCIDENCE OF HPV INFECTION IN YOUNG BOYS WAS SIGNIFICANTLY REDUCED. AT THAT TIME, THERE WAS NO RECOMMENDATION FOR MALE VACCINATION

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REDUCED HEALTHCARE EXPENSE

- FULL VACCINATION REDUCES THE NEED FOR SCREENING
- REDUCES THE NEED FOR SUBSEQUENT MEDICAL EVALUATIONS
 - BIOPSIES
 - INVASIVE PROCEDURES FROM POSITIVE SCREENS
 - REDUCES ANXIETIES RELATED TO FOLLOW UP CARE

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MORE FACTS TO CONSIDER:

AS CERVICAL CANCER HAS DECLINED IN THE US, HPV OROPHARYNGEAL, VULVAR AND ANAL CANCERS HAVE BEEN INCREASING!

2012-2016 HPV CAUSED MORE OROPHARYNGEAL CANCER THAN CERVICAL

THERE ARE **NO** FORMAL SCREENS FOR THE OTHER HPV CANCERS

VACCINATION CAN HAVE HUGE OVERALL HEALTHCARE IMPACT

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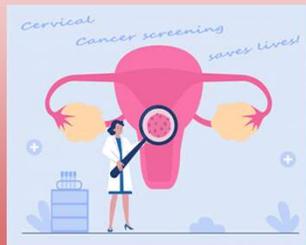
HPV & CANCER

- NEARLY ALL ARE CERVICAL CANCER
- SOME CANCERS OF THE VULVA, PENIS, ANUS, OROPHARYNX (BACK OF THROAT, BASE OF TONGUE, TONSILLAR)
- 90% OF ANAL AND CERVICAL CANCERS ARE CAUSED BY HPV
- 70% OF VULVAR AND VAGINAL CULTURES ARE CAUSED BY HPV
- 60% OF PENILE CANCERS ARE CAUSED BY HPV
- 60-70% OF THROAT CANCERS MAY BE LINKED TO HPV (FORMERLY TOBACCO & ALCOHOL)
- HPV DNA HAS BEEN FOUND IN CANCEROUS CELLS FROM MANY SPECIMENS OBTAINED IN SURGERY

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CERVICAL CANCER

- 90% CAUSED BY HPV
- CAN TAKE 20 YEARS OR LONGER TO DEVELOP AFTER INITIAL INFECTION
- EARLY CERVICAL CANCER DOES NOT CAUSE SYMPTOMS
- REGULAR SCREENING IS VITAL TO DETECT PRECANCEROUS LESIONS IN THE CERVIX



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GUIDELINES FOR CERVICAL CANCER SCREENING

AGES 21-29
MUST HAVE A PAP TEST EVERY 3 YEARS

AGES 30-65
HAVE A PAP TEST EVERY 3 YEARS **OR** EVERY 5 YEARS IF THEY HAVE THE HPV DNA TEST AT THE SAME TIME AS CERVICAL SCREEN

OVER 65
CAN STOP CERVICAL CANCER SCREENING IF THEY HAVE 3 NORMAL SCREENS OR IF THEY HAVE HAD 2 NEGATIVE HPV DNA TESTS

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NATURAL COURSE OF INFECTION

- MOST OF THE TIME, HPV GOES AWAY WITHIN 2 YEARS AND DOES NOT CAUSE PROBLEMS
 - LIKE OTHER VIRUSES, THE IMMUNE SYSTEM CAN TYPICALLY FIGHT OFF HPV NATURALLY
- WHEN IT STAYS IN THE BODY FOR MANY YEARS, IT CAN CAUSE CANCER
- IT IS NOT KNOWN WHY HPV GOES AWAY IN MOST, BUT CAUSES CANCER IN OTHERS
- THERE ARE NO TESTS FOR HPV INFECTION
- WE CAN TEST CANCEROUS CELLS FOR HPV VIRAL DNA

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TIMING OF VACCINATION

- PREVENTION OF HPV INFECTION PROVIDES THE GREATEST PROTECTION TO HPV RELATED MEDICAL PROBLEMS.
- THE BEST PREVENTION INVOLVES BEING FULLY VACCINATED **BEFORE** HAVING ANY CONTACT WITH THE VIRUS

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HPV=SEX

NOT MY CHILD!

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PARENTS ARE WORRIED ABOUT...

- VACCINE CONTINUES TO RIAL UP CONTROVERSY BECAUSE IT PROVIDES PROTECTION FROM A SEXUALLY TRANSMITTED DISEASE
- MOST PARENTS DONT UNDERSTAND WHY THE STARTING AGE IS 9-11
- MOST PARENTS ARE ALSO CLUELESS ABOUT WHEN THEIR CHILDREN START TO HAVE SEX AND OTHER INTIMATE ENCOUNTERS.



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TEENAGERS LOVE TO TRY NEW THINGS!



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TEENAGERS...SIGH!

- 10% OF GIRLS ARE INFECTED BY AGE 15
- 20% OF GIRLS ARE INFECTED BY AGE 17
- 12.5 % OF MALES AGED 14-19
- 38.2% OF MALES AGED 20-24
- SEXUAL HABITS ARE CHANGING. INTERCOURSE IS NOT PREFERRED, BUT EVERYTHING ELSE IS!

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NAVIGATING VACCINE HESITANCY

DECISION MAKING AROUND VACCINATION

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BASIC VACCINE FACTS

- VACCINATION IS ONE OF THE MOST SUCCESSFUL PUBLIC HEALTH INTERVENTIONS
- VACCINATION HAS LED TO THE ELIMINATION AND CONTROL OF MANY DISEASES THAT WERE ONCE COMMON IN THE USA.
- RECENT OUTBREAKS OF VACCINE PREVENTABLE DISEASE (VPD) INDICATE THAT CONTINUED VIGILANCE IS NEEDED

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IMPORTANCE OF VACCINE VIGILANCE

- HERD IMMUNITY IS NEEDED TO PREVENT PERSON TO PERSON TRANSMISSION OF DISEASES
- UNDER VACCINATED COMMUNITIES HAVE THE HIGHEST INCIDENCE OF VPD
- GROWING INCIDENCE OF ANTIBIOTIC RESISTANCE AND GLOBAL TRAVEL IS MAKING VACCINATION EVEN MORE IMPORTANT

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PARENTAL CONCERNS ARE ON THE RISE

TOP REASONS FOR NOT VACCINATING INCLUDE:

1. NECESSITY
2. SAFETY
3. SIDE EFFECTS
4. AUTISM
5. VACCINE ADDITIVES
6. LONG TERM HEALTH PROBLEMS
7. TOO MUCH FOR THE IMMUNE SYSTEM TO HANDLE



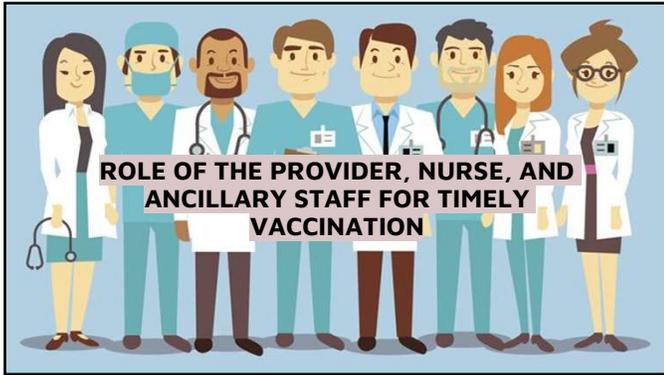
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DECISION MAKING AROUND VACCINATION INVOLVES A COMPLEX MIX OF SPIRITUAL, POLITICAL, CULTURAL, PSYCHOSOCIAL AND COGNITIVE FACTORS

MOST FIT INTO 3 GENERAL CATEGORIES:

<p>VACCINE CONFIDENCE</p> <p>LACK OF EFFECTIVENESS SAFETY VACCINE SYSTEM IN GENERAL GOVERNMENT</p>	<p>COMPLACENCY</p> <p>FOR MOST PARENTS, THE PERCEIVED RISK OF INFECTION FROM VPD'S IS RELATIVELY LOW</p>	<p>LACK OF CONVENIENCE</p> <p>VACCINE AVAILABILITY VACCINE ACCESSIBILITY VACCINE APPEAL: INCLUDES TIMING, PLACE, CULTURAL AND LANGUAGE CONCERNS</p>
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WHEN THEY HAVE QUESTIONS, PARENTS WILL SEEK INFORMATION!

- PARENTS WILL SEARCH THE INTERNET!
 - MANY SITES ARE INACCURATE AND PROVIDE VACCINE NEGATIVE INFORMATION
 - THERE ARE A LARGE NUMBER OF "VACCINE" WEBSITES THAT LOOK VERY PROFESSIONAL
- PARENTS WILL CONSIDER INFORMATION PROVIDED TO THEM FROM TRUSTED HEALTHCARE PROVIDERS
 - 66% OF PARENTS BELIEVE THAT THEIR PROVIDER IS THE MOST VALUABLE SOURCE OF INFORMATION
 - 23% CONTINUE TO BELIEVE THE INTERNET



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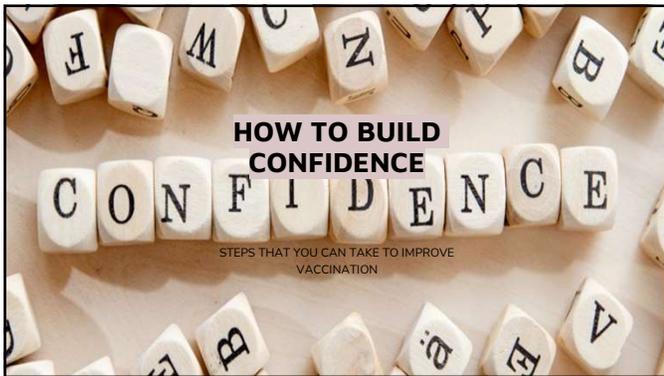
PARENTS WHO RECEIVE INFORMATION FROM THEIR PROVIDER ARE LESS LIKELY TO HAVE CONCERNS THAN THOSE THAT GET INFORMATION FROM THE INTERNET, FAMILY, OR FRIENDS

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EARLY, HONEST COUNSELING IN THE OFFICE CAN MAKE A SIGNIFICANT DIFFERENCE WITH VACCINE HESITANT PARENTS AND INCREASE VACCINE CONFIDENCE

- HOW YOU DISCUSS NEEDED VACCINES
 - KNOW HOW TO ADDRESS COMMONLY ASKED QUESTIONS:
 - BE KNOWLEDGEABLE ABOUT VACCINE COMPONENTS, ESPECIALLY MERCURY, ALUMINUM.
 - KNOW WHAT A CHILD'S IMMUNE SYSTEM CAN DO AND BE ABLE TO TALK ABOUT "OVERWHELMING THE IMMUNE SYSTEM"
- BE ABLE TO PROVIDE ONLINE RESOURCES
 - AAP.ORG
 - CDC.GOV

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START EARLY

- DISCUSS VACCINATIONS IN A SAFE AND NON-JUDGEMENTAL SPACE
- PROVIDE INFORMATION THAT YOU KNOW AND BE TRUTHFUL
- DON'T BE AFRAID TO SAY "I DON'T KNOW THAT ANSWER, BUT I WILL GET THAT INFORMATION FOR YOU."

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PRESENT THE VACCINATIONS WITH A "DEFAULT APPROACH"

- STATE THE VACCINATION RECOMMENDATION AS IT IS
 - DO NOT USE WORDS LIKE "OPTIONAL" OR SAY THINGS LIKE "YOU CAN GET THESE IF YOU WANT"
- PRESENTING VACCINES THIS WAY HAS BEEN SHOWN THAT PARENTS HAVE HIGHER VACCINE ACCEPTANCE WITH THIS, EVEN IF INITIALLY DESCRIBED AS A LOWER RATING WITH VISIT EXPERIENCE

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BE HONEST ABOUT SIDE EFFECTS

- VACCINE RELATED ADVERSE REACTIONS (VAER'S) ARE EXTREMELY RARE
- DISCUSSING COMMON SIDE EFFECTS OF VACCINES BEING GIVEN HELPS WITH VACCINE CONFIDENCE WHEN THEY DO OCCUR



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PROVIDE PERSONAL EXPERIENCE

- I WAS CONCERNED AS WELL, BUT...
- I WAS SCARED WITH MY CHILD'S FIRST VACCINES AS WELL
- HERE'S WHAT I COMMONLY SEE AFTER VACCINATIONS

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BUILD TRUST WITH PARENTS

- SPEND EXTRA TIME, IF NEEDED, DISCUSSING VACCINES
- ADDRESS PARENTAL CONCERNS WITH AN OPEN MIND
 - ASK WHAT MADE THEM HAVE THE CONCERN, WHERE THEIR INFORMATION CAME FROM
- PROVIDE GOOD KNOWLEDGE
 - KNOW WHAT THE VIS SHEETS SAY, HAVE SOME BACKGROUND KNOWLEDGE ON THE DISEASES BEING VACCINATED FOR
- PROVIDE HONEST ANSWERS
 - DON'T BE AFRAID TO SAY THAT YOU ARE NOT SURE ABOUT THEIR QUESTION. TAKING TIME TO LOOK SOMETHING UP AND RESPOND TO THE PARENTS MEANS A LOT TO THEM

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ADDRESS PAIN

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FOCUS ON THE PROTECTION OF THE CHILD AND THE COMMUNITY

- TALKING ABOUT THE DISEASES THAT ARE BEING PREVENTED AND SUBSEQUENT SIDE EFFECTS IS VERY HELPFUL
 - HOSPITALIZATION
 - INCREASED HEALTH CARE, MORE OFFICE VISITS
 - LONG TERM EFFECTS OF VPD'S
 - DEATH
- DISCUSS HOW VACCINATION HELPS THE COMMUNITY
 - FAMILY AND FRIENDS THAT ARE IMMUNOCOMPROMISED AND CANNOT RECEIVE VACCINATION
 - THE IMPORTANCE OF HERD IMMUNITY AND THE REDUCTION OF DISEASE AND DISEASE SPREAD

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IN SUMMARY

- HPV IS A VERY COMMON INFECTION THAT CAN LEAD TO WARTS AND CANCER
- THERE IS A WELL TOLERATED VACCINE THAT, WHEN GIVEN ON TIME AND BEFORE FIRST EXPOSURE, IS VERY EFFECTIVE AND CAN PREVENT INFECTION
- THE RELATIONSHIP THAT THE ENTIRE HEALTHCARE TEAM BUILDS WILL HELP BUILD CONFIDENCE WITH PARENTS AND SUBSEQUENTLY IMPROVE VACCINATION RATES
- IMPROVED VACCINATION RATES WILL LIMIT VACCINE RELATED ILLNESS AND REDUCE HEALTHCARE COSTS AS WELL AS OUTBREAKS OF VACCINE PREVENTABLE ILLNESS.

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QUESTIONS???

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Post-Test

- Post-test
 - Nurses interested in continuing education credit, visit https://ndhealth.co1.qualtrics.com/jfe/form/SV_8qvcYiFVgk2LXtI
 - Successfully complete the five-question post-test to receive your certificate
 - Credit for this session will not expire until June 13, 2023.
- This presentation will be posted to our website: www.hhs.nd.gov/immunizations