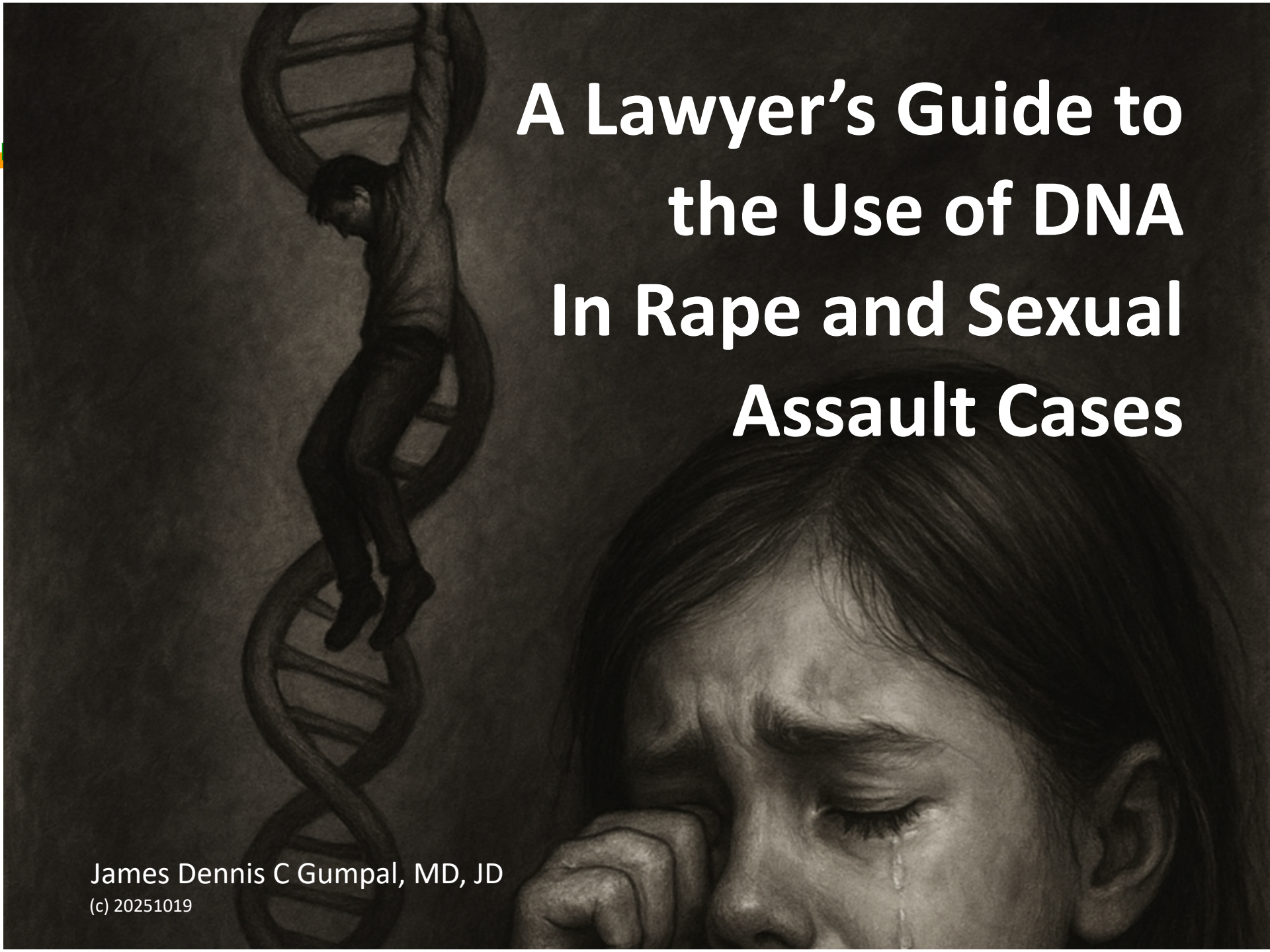

# A Lawyer's Guide to the Use of DNA In Rape and Sexual Assault Cases

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This presentation was prepared for instructional use in Medical Jurisprudence courses at the University of the Philippines College of Law and the Angeles University Foundation School of Law.



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*Title image : OpenAI. (2025). Person hanging in a DNA rope and a crying girl [AI-generated image]. ChatGPT. https://chat.openai.com/*

# Learning Objectives

1. Understand the scientific basis of DNA evidence in rape cases.
2. Learn how to collect and process DNA evidence (victims and suspects).
3. Identify legal requirements (informed consent, chain of custody, admissibility).
4. Master the presentation of DNA evidence in court & its probative value.

# Legal Framework

- **RA 8353** – Anti-Rape Law of 1997
- **RA 9262** – Violence Against Women and Their Children Act
- **Rules on Evidence** (Rule 130, 132)
- **Rule on Examination of a Child Witness** (A.M. No. 004-07-SC)

# Why DNA Evidence Matters in Rape Cases

- Biological trace evidence often remains when witness testimony is weak.
- Helps identify perpetrators, exclude innocent suspects.
- Works for female and male victims (anal/oral/orifice swabs, fingernails, clothing).
- Empowers legal advocacy with science-based proof.

# Sources of DNA Evidence in Rape Cases

- **Victim**: vaginal/anal/oral swabs, fingernail scrapings, pubic hair, underwear, bedding, tissues.
- **Suspect**: buccal swab (cheek), blood sample, swabs of clothing or tools.
- **Environment**: condoms, bedsheets, clothing, weapons.

# Collection from Victim – Best Practices

- Conducted by a medico-legal physician or by the Women and Child Protection Unit (WCPU).
- Use a standard **Sexual Assault Evidence Collection Kit** (SAECK).
- **Be mindful of the following**:
  - private setting
  - victim consent,
  - minimal delay,
  - proper labelling.
- **Reference samples** are also taken (saliva or blood) for comparison.

# Collection from Suspect – Legal Requirements

- Voluntary written informed consent OR court order (per A.M. No. 06-11-5-SC).
- **Sample types**: buccal swab, blood.
- Chain of custody begins from first collection point.
- Ensure suspect’s rights are respected
- Careful collection, avoid contamination

# Where DNA is Processed in the Philippines

- **Accredited laboratories:**
  - PNP Forensic Group – DNA Section
  - NBI DNA Analysis Division
  - UP-NIH DNA Analysis Laboratory.
- **Laboratory steps:** extraction → quantification → PCR amplification → separation → STR typing → profile generation
- Final report with **DNA profile** and **statistical interpretation**.

# Understanding DNA Profiles

- **Alleles**: different versions of a gene (locus); each person inherits an allele from their biological parents, e.g.,
  - Blood type has 3 alleles: A, B and O
  - STRs in specific loci has many alleles in selected loci based on the number of repeats
- **Allele frequency:** proportion of a population carrying that allele.
- **Genotype**: the pair of alleles at a locus for a person.
- **Combined genotype frequency**: product of locus genotype frequencies across loci which shows how likely another person in the population has the same DNA alleles as the reference sample tested.

# Understanding DNA Profiles

- **Random Match Probability (RMP):** likelihood that a random person has the same profile.
- **STR: Short Tandem Repeats** are repeating patterns of nitrogenous bases found in introns of genes. These are pre-selected because they are short and highly variable in the population and therefore can be used for identification, determining parentage and kinship.
- **STR loci:** locations of STRs in the DNA Genome (which are divided into chromosomes). There can be 10, 13, 20 or more pre-selected STRs for DNA profiling.

# Sample Case

- Sandy was sexually abused possibly by 3 unknown persons during a party that had gone haywire where she was drugged.
- After reporting the incident to the police, DNA was collected from AB's vaginal swab.
- DNA were also collected from the three suspects, Randy, Mandy, and Rudy through a buccal swabs.
- The results of the DNA profiles of Sandy, Randy, Mandy, and Rudy are printed on the next slide. Which of the three suspects matched the DNA collected from the vaginal swab?

# Interpreting STR DNA Results

## Randy

RANDY

- Knowing that Randy's DNA profile matched the DNA collected from the vaginal swab, what is the combined genotype frequency (CGF)? The CGF is computed by multiplying all the genotype frequencies from the 13 loci. The product is the CGF.
- What does combined genotypre frequency mean?
- How do you determine the random match probability (RMP)?
- What does the RMP mean?

# Interpreting STR DNA Results
## Mandy & Rudy

MANDY

- How many STR allele matched with Mandy?
- What does this mean? Is it possible that Mandy is the source of the DNA in the vaginal swab? Why?

RUDY

- How many STR allele matched with Mandy?
- What does this mean? Is it possible that Mandy is the source of the DNA in the vaginal swab? Why?

# Interpreting STR DNA Results
# DNA Profile of 3 possible persons

| Locus | Swab (donor) Genotype | Randy | Randy match? | Mandy | Mandy match? | Rudy | Rudy | Allele a (freq p) | Allele b (freq q) | Genotype freq (2pq or p^2) |
|---|---|---|---|---|---|---|---|---|---|---|
| **D3S1358** | 15,17 | 15,17 | Yes | 14,15 | yes | 15,16 | yes | 15 (0.22) | 17 (0.18) | 0.07920000 |
| **vWA** | 16,18 | 16,18 | Yes | 18,19 | yes | 15,18 | yes | 16 (0.19) | 18 (0.13) | 0.04940000 |
| **FGA** | 22,24 | 22,24 | Yes | 22,24 | yes | 22,23 | yes | 22 (0.12) | 24 (0.11) | 0.02640000 |
| **TH01** | 7,9 | 7,9 | Yes | 6,9 | yes | 9,8 | yes | 7 (0.28) | 9 (0.16) | 0.08960000 |
| **TPOX** | 8,11 | 8,11 | Yes | 8,9 | yes | 8,8 | yes | 8 (0.25) | 11 (0.10) | 0.05000000 |
| **CSF1PO** | 10,12 | 10,12 | Yes | 10,12 | yes | 10,11 | yes | 10 (0.21) | 12 (0.14) | 0.05880000 |
| **D5S818** | 11,12 | 11,12 | Yes | 11,13 | No | 10,12 | yes | 11 (0.20) | 12 (0.15) | 0.06000000 |
| **D13S317** | 11,13 | 11,13 | Yes | 12,13 | yes | 8,11 | yes | 11 (0.18) | 13 (0.12) | 0.04320000 |
| **D7S820** | 8,11 | 8,11 | Yes | 8,10 | yes | 9,11 | yes | 8 (0.24) | 11 (0.16) | 0.07680000 |
| **D16S539** | 10,12 | 10,12 | Yes | 9,10 | yes | 10,11 | yes | 10 (0.20) | 12 (0.14) | 0.05600000 |
| **D8S1179** | 13,15 | 13,15 | Yes | 12,14 | no | 14,12 | No | 13 (0.17) | 15 (0.13) | 0.04420000 |
| **D21S11** | 29,31 | 29,31 | Yes | 30,31 | yes | 28,30 | no | 29 (0.11) | 31 (0.09) | 0.01980000 |
| **D18S51** | 12,16 | 12,16 | Yes | 13,16 | yes | 11,15 | No | 12 (0.16) | 16 (0.10) | 0.03200000 |
| | | | | **Combined Genotype Frequency** | | | | **0.00000000000000000008494407268684** | | |

# Per-Locus Genotype Frequency Formulas

| Type of Genotype | Formula | Genotype Frequency (GF) |
|---|---|---|
| **Heterozygous (two different alleles a and b)** | (2pq) | If alleles 10 (p=0.2) and 12 (q=0.15) then GF= 2×0.2×0.15 = 0.06 |
| **Homozygous (same alleles a = b)** | ($p^2$) | If allele 15 (p=0.22) then GF= (0.22^2 = 0.0484) |

Each genotype's frequency represents the probability that a random, unrelated person in the population has that same genotype at that locus.

# Combined Genotype Frequency

The **Combined Genotype Frequency** (**CGF**) is the product of all genotype frequencies across the STR loci tested:

**CGF**= 0.04940000 x 0.02640000 x 0.08960000 x 0.05000000 x 0.05880000 x 0.06000000 x 0.04320000 x 0.07680000 x 0.05600000 x 0.04420000 x 0.01980000 x 0.03200000

**CGF** = 0.000000000000000008494407268684

**CGF** ≈ **8.494407268684** x $10^{-18}$ or roughly, **8.5 x $10^{-18}$**

That means it is statistically extremely unlikely that any random unrelated person other than Randy would match the sperm DNA.

# Random Match Probability

The **Combined Genotype Frequency** (**CGF**) is converted into the **Random Match Probability** by getting its inverse:

**RMP** = 1/**CGF**

For Randy,

**CGF** = 0.00000000000000008494407268684

**RMP** = 1/ **0.00000000000000008494407268684**

**≈ $1.18 \times 10^{17}$**

# Interpretation

| MEASURE | HOW TO SAY IT | MEANING |
|---|---|---|
| **CGF = $8.49 \times 10^{-18}$** | The probability that a random, unrelated person would coincidentally have the same DNA profile as the one you analyzed is 8.5 in 1,000,000,000,000,000,000” | Very small probability |
| **RMP = $1.18 \times 10^{17}$** | “The profile would be expected to occur in about one in 118 quadrillion people” | Same meaning, expressed as a ratio |

# Practical Thresholds for Perspective

| CGF | Approx. RMP | Interpretation |
|---|---|---|
| $10^{-6}$ | 1 in 1 million | Moderate match |
| $10^{-9}$ | 1 in 1 billion | Very strong match |
| $10^{-12}$ | **1 in 1 trillion** | **Extremely strong** |
| $10^{-18}$ **(RANDY)** | **1 in 100 quadrillion+** | **Practically unique** |

# Admissibility – "Rule on DNA Evidence"

## A.M. No. 06-11-5-SC (Oct. 15, 2007)

- **Requirements:** relevance, reliability, competence of expert, valid chain of custody.
- DNA evidence is admissible; its weight depends on four (Vallejo) standards.

| VALLEJO STANDARDS | CHAIN OF CUSTODY |
|---|---|
| 1. How is the sample collected? | Who collected the sample? |
| 2. How was the sample handled, transferred, stored? | Who subsequently handled, transported and stored the sample? |
| 3. How was the sample analyzed? What methodology was used? Is this methodology scientifically recognized and used? | Who analyzed the samples? |
| 4. Is the person who analyzed the sample competent to do so? | |

# Legal Procedure – Collecting from Accused

- **Motion for issuance of a court order for the taking of DNA sample:** Order signed by judge, then collection in presence of the counsel for the accused or his representative.
- **Establish the *prima facie* basis** for the court to issue an order for the taking of DNA sample for the purpose of determining the source of the DNA sample.
- **Must show:** identity issue, relevance, minimal intrusion.
- **Possible objections:** No ***prima facie*** basis for the taking of a DNA sample.
- **Due process:**
  - Written consent from the accused
  - Presence of the accused's counsel or his representative from the time of collection until the sample is analyzed and the results obtained.

# Chain of Custody – Lawyer's Checklist

- ☐ **Labeling**: unique code, date/time, collector's name.
- ☐ **Transfer log**: each person to sign entry.
- ☐ Sealed evidence bags, proper storage.
- ☐ Laboratory accreditation certificates.
- ☐ Audit for gaps (holes weaken probative value).

# Presentation of DNA Evidence in Court

- **Witnesses**: evidence custodian, lab analyst, expert.
- **Documents**:
  - chain of custody form
  - lab request, lab report,
  - DNA profile chart/graph
- **Use demonstrative exhibits**:
  - STR loci charts
  - RMP calculations
- **Cross-examination strategy**: ask about
  - contamination
  - allele dropout
  - lab accreditation (by the DOH)

# Probative Value and Thresholds

- A match with RMP of 1 in 1,000 is persuasive but not automatic conviction. (0.1%)
- **Philippine courts:** identification probabilities **>99.9%** are influential.
- DNA is not standalone proof but **strong corroboration** when combined with other evidence.
- Exclusion (mismatch) is **absolute**.

# Practical Tips for Lawyers

- Engage forensic expert early; request DNA profile disclosures.
- Preserve victim's and suspect's reference samples.
- Verify lab accreditation status and national DNA database linkage.
- **Use simple analogies**: "Imagine finding only 1 in a million people could share this result."
- Be prepared for defense challenges on procedure and statistics.

# Summary & Key Takeaways

- **DNA** = powerful but method-sensitive.
- **Admissibility** depends on:
  - clean collection
  - secure custody
  - reliable lab
  - competent expert.
- Only lawyers with sufficient knowledge on DNA profiling are competent to handle the case. Training is necessary.
- **Preparedness** = more reliable justice for victims and accuracy for accused.

# Preparing the Expert Witness

# Expert Witnesses

Under **Rule 130, Section 49 of the Rules on Evidence,** a witness who possesses **special knowledge**, **skill**, **experience**, or **training** may testify on a matter requiring scientific or technical expertise.

The prosecution usually qualifies the expert before testimony by establishing credentials through ***voir dire*** examination. Typical expert witnesses in rape cases include:

| Discipline | Typical Expertise / Testimony |
|---|---|
| Forensic Physician | Medico-legal examination findings, injury interpretation |
| Forensic Chemist / DNA Analyst | Biological evidence and DNA profiling |
| Psychiatrist / Psychologist | Rape Trauma Syndrome (RTS) or Post-Traumatic Stress Disorder (PTSD) |
| Social Worker | Victim's demeanor, family environment, psychosocial impact |

# Steps in Preparing the Expert Witness

## 1. Review and Familiarization

- Provide the expert with **certified copies** of the
  - medico-legal report,
  - photographs,
  - laboratory results,
  - and chain-of-custody forms.
- Discuss the **scope of expected testimony**—
  - facts,
  - methodology, and
  - conclusions.
- **Clarify limits**: the expert should not speculate on guilt, only on scientific interpretation.

# Steps in Preparing the Expert Witness

## 2. Qualifying the Expert

Prepare a direct examination checklist to establish the expert's qualifications:

- ☑ Identity and profession (licensed physician, chemist, or psychologist).
- ☑ Educational background and years of practice.
- ☑ Publication of articles in peer-reviewed journal, text books.
- ☑ Institutional affiliation (e.g., PNP Crime Lab, DOH hospital, WCPU).
- ☑ Number of similar examinations conducted.
- ☑ Court appearances as expert witness (prior experience).

# Steps in Preparing the Expert Witness

## 3. Establishing Chain of Custody

1. The expert must demonstrate how evidence (e.g., vaginal swabs, clothing, DNA samples) was collected, sealed, labeled, stored, and examined.
2. Use the **DOH–PNP standard chain-of-custody form** to avoid challenges under Rule 136 §4 (tampering or substitution).

# Steps in Preparing the Expert Witness

## 4. Coordinating with the Prosecutor

The expert should explain the **technique** or **protocol** used (e.g., DNA STR analysis, colposcopic exam, rape kit).

Refer to the **Daubert standard** (Rule 128 §3, in harmony with ***People v. Vallejo,*** G.R. No. 144656, May 9 2002) which requires:

1. Proper collection and preservation of samples.
2. Competence of the examiner.
3. Scientific reliability of the method.
4. Accurate documentation and results interpretation.

Republic of the Philippines
National Police Commission
**PHILIPPINE NATIONAL POLICE**
_____
_____

**CHAIN OF CUSTODY FORM**

Nature of Case: _____
Name of Suspects:_____
Time, Date and Place of Occurrence:_____
Arresting Officers/Operating Unit:_____
Description of Evidence: _____
_____
_____
_____
_____

TURNED OVER BY :_____
(Name and Designation)

Agency/Address :_____
Time and Date :_____
Remarks :_____

RECEIVED BY :_____
(Name and Designation)

Agency/Address :_____
Time and Date :_____
Remarks :_____

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TURNED OVER BY :_____
(Name and Designation)

Agency/Address :_____
Time and Date :_____
Remarks :_____

RECEIVED BY :_____
(Name and Designation)

Agency/Address :_____
Time and Date :_____
Remarks :_____

# Steps in Preparing the Expert Witness

## 5. Coordinating with the Prosecutor

1. Conduct a **pre-trial conference** to align:

   **theory of the case** vis-avis **evidentiary needs.**

2. **Prepare visual aids** for courtroom presentation.
   - anatomical charts,
   - chain-of-custody diagram

3. **Anticipate defense cross-examination** on:
   - contamination,
   - bias, or
   - competence.

# Steps in Preparing the Expert Witness

## 6. Handling Cross-Examination

**Advise the expert to:**

1. Stay within the bounds of expertise
2. Avoid volunteering conclusions on legal guilt
3. Answer clearly, briefly, and factually.
4. **Use layman's terms** when describing medical findings (e.g., "a healed laceration means prior penetration, not necessarily by force").
5. **Acknowledge limitations** ("this finding is consistent with, but not conclusive of, sexual intercourse").

# Steps in Preparing the Expert Witness

## 6. Ethical and Victim-Sensitive Conduct

1. **Maintain confidentiality** per
   a. **R.A. 8505 §5** (Rape Victim Assistance and Protection Act of 1998) and
   b. **R.A. 10173** (Data Privacy Act).
2. RA 8505 §4 - Obtain **written** informed consent before examination or testimony.
3. **Child or minor victims**
   a. **RA 7610** (Special Protection of Children Against Abuse, Exploitation, and Discrimination Act). - can be interviewed **only with** the assistance of a parent, guardian, social worker, or child psychologist.
   b. **DSWD Guidelines** - require **written** informed consent from the child's parent or guardian, and **assent** from the child if capable of understanding.

# Steps in Preparing the Expert Witness

## 6. Ethical and Victim-Sensitive Conduct

4. Use **gender-sensitive language** and **a**void **retraumatization** as required under:

   a. **RA 8505** - Requires sensitive, compassionate, and non-judgmental treatment of rape survivors. Its IRR specify that investigators, medical practitioners, and social workers must use respectful, trauma-informed communication.

   b. **RA 9262 (Anti-VAWC Act of 2004)** - Recognizes the need for psychological and emotional recovery of victims; thus, courtroom and investigative language must avoid retraumatization.

   c. **Supreme Court Administrative Circular No. 83-2007 - d**irects the use of gender-fair language in all judicial and legal communications.

# Practical Tips

| Do's | Don'ts |
| --- | --- |
| Rehearse testimony without "coaching." | Never suggest answers or conclusions. |
| Ensure all exhibits are marked before trial. | Don't bring unmarked materials to court. |
| Use simple analogies for jurists unfamiliar with medicine. | Avoid excessive jargon. |
| Bring a copy of all official guidelines (DOH AO 2022-0037, PNP Manual). | Never cite an unpublished procedure. |

# Common Pitfalls to Avoid

- **Unqualified witness** — failing to formally establish credentials.
- **Ignoring or broken chain of custody** — specimens collected but not sealed or documented.
- **Overstating conclusions** — claiming certainty beyond scientific limits.
- **Contradicting victim's testimony** — inconsistent timelines can weaken the prosecution.

# Common Pitfalls to Avoid

- **Lack of courtroom preparation** — nervous, verbose, or defensive witnesses reduce credibility.
- **Assuming no sperm/injury** = no rape
- **Treating medico-legal reports** as conclusive proof
- **Overlooking psychological trauma** evidence

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# End