



ISPOR Europe Conference 2019  
2-6 November 2019 Copenhagen, Denmark



# CHEMOTHERAPY INDUCED NAUSEA VOMITING: VALIDATION OF RISK SCORING ALGORITHM IN PATIENTS WITH GYNECOLOGICAL AND GASTROINTESTINAL CANCERS

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# INTRODUCTION

- CINV is the most common and debilitating side effects of chemotherapy (Incidence rate 70-80%)
  - Classification of Chemotherapeutic drugs: Highly emetogenic, Moderately emetogenic, Low emetogenic and Minimally emetogenic agents.
  - CINV can have a significant impact on a person's physical and mental health and healthcare resources.
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- CINV affects economic aspect in terms of both direct and indirect costs.
  - CINV classification: Acute or Delayed based on the timing and type of chemotherapy drugs involved.
  - Despite incredible advances in prophylactic-antiemetic therapy & use of standardized anti-emetic guidelines, up-to 40% of cancer patients receiving chemotherapy fail to attain complete control of CINV
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## **NEED FOR STUDY**

- Evidence-based antiemetic guidelines have been instrumental in establishing and communicating the emetogenicity of various chemotherapeutics used but they fall short at including individual patient factors
  - To help incorporate patient risk factors into the selection of optimal antiemetic therapy, CINV risk scoring system has been developed by Dranitsaris et al in Ottawa, Canada in 2017
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# RISK FACTORS FOR CINV

## DRUG RELATED

- Emetogenicity
- Dose
- Schedule (whether the drug is given on a single-day versus multi-day basis)
- Route of administration

## PATIENT RELATED

- Age
  - Gender
  - Prior chemotherapy
  - History of motion sickness or nausea with pregnancy
  - History of chronic alcohol use
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# OBJECTIVE

- To prospectively evaluate the Risk scoring algorithm to determine its ability to accurately identify patients deemed to be at high risk for Acute & Delayed CINV.
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| Sl.no | SCORING ALGORITHM FOR ACUTE CINV<br>Risk Factor                                                                                              | Score | Patient<br>score |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------|
| 1.    | Base score                                                                                                                                   | +10   |                  |
| 2.    | If the patient is 40–60 years of age                                                                                                         | -3    |                  |
| 3.    | If the patient is $\geq 60$ years of age                                                                                                     | -4    |                  |
| 4.    | If the patient has existing comorbidity (for example, diabetes or cardiovascular, gastrointestinal, musculoskeletal, thyroid, other disease) | -2    |                  |
| 5.    | If the patient consumes at least 1 alcoholic drink daily.                                                                                    | -1    |                  |
| 6.    | If the patient is about to receive cycle 3 or beyond                                                                                         | -1    |                  |
| 7.    | If the disease site is gynecologic and gastrointestinal                                                                                      | -2    |                  |
| 8.    | If the patient is about to receive anthracycline-based chemotherapy                                                                          | +1    |                  |
| 9.    | If the patient is about to receive platinum-based chemotherapy                                                                               | +3    |                  |
| 10.   | If the patient has disease stage i or ii                                                                                                     | +1    |                  |
| 11.   | If the patient is taking non-prescribed treatments for emesis control at home                                                                | +2    |                  |

| Sl.no | SCORING ALGORITHM FOR DELAYED CINV<br>Risk Factor                                                        | Score | Patient<br>score |
|-------|----------------------------------------------------------------------------------------------------------|-------|------------------|
| 1.    | Base score                                                                                               | +20   |                  |
| 2.    | If the patient is $\leq 40$ years of age                                                                 | +8    |                  |
| 3.    | If the patient received a 5-HT <sub>3</sub> anti-emetic with or without dexamethasone after chemotherapy | +5    |                  |
| 4.    | If the patient had nausea or vomiting before starting the current chemotherapy                           | +14   |                  |
| 5.    | If the patient had morning sickness during a pregnancy (if applicable)                                   | +7    |                  |
| 6.    | If the patient is taking non-prescribed anti-emetics at home                                             | +23   |                  |
| 7.    | If the patient had 1 or more vomiting episodes during the first 24 hours after chemotherapy              | +7    |                  |
| 8.    | If the patient is about to receive cycle 3 or beyond                                                     | -7    |                  |
| 9.    | For every hour the patient slept the night before chemotherapy                                           | -1    |                  |

# METHODOLOGY



**STUDY SITE:** Department of Oncology at a Tertiary Care Teaching Hospital in India

**STUDY DESIGN:** Prospective Observational Study

**STUDY SIZE:** 128 patients

**Inclusion criteria :** Individuals above the age of 18 years with confirmed histological malignancy undergoing chemotherapy

**Exclusion criteria:** Patients undergoing radiotherapy and Patients who are unwilling to participate in the study

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# PROCEDURE

Patients who satisfied inclusion criteria were included in the study after obtaining written informed consent



Prior to every cycle of chemotherapy, the scoring-systems were applied to stratify patients into low and high risk groups



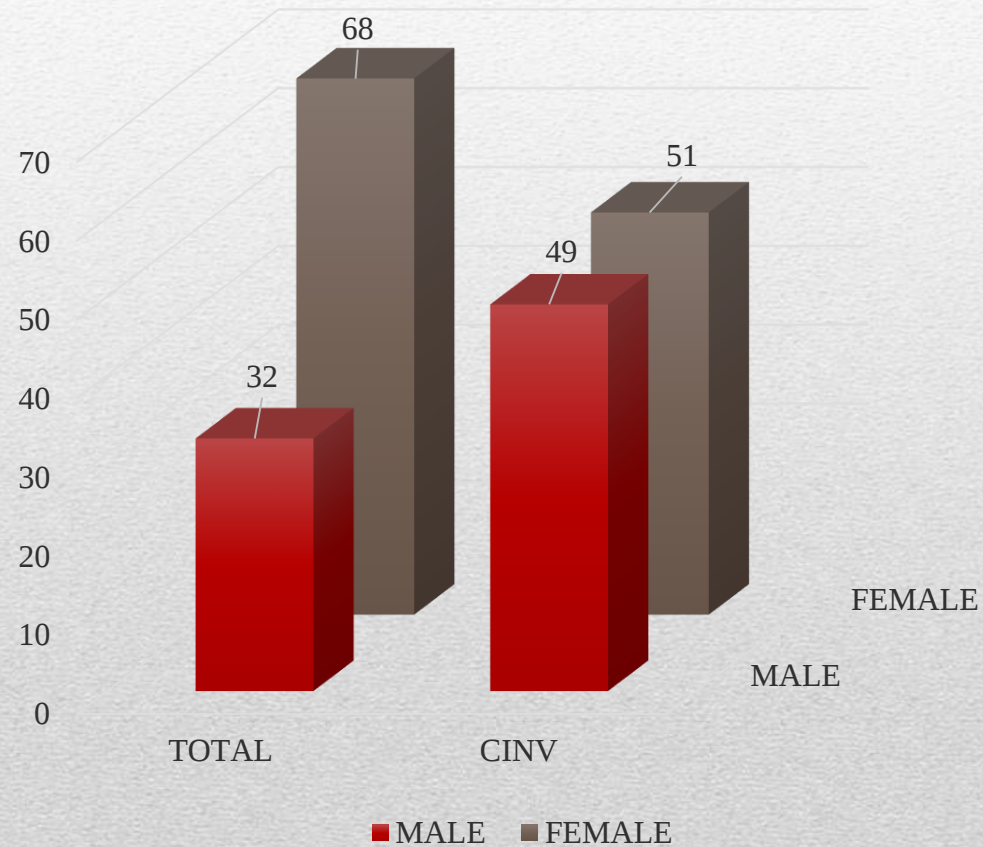
Patients were followed-up after day 1 & on day 5 of chemotherapy to record any evidences of acute & delayed CINV through phone call



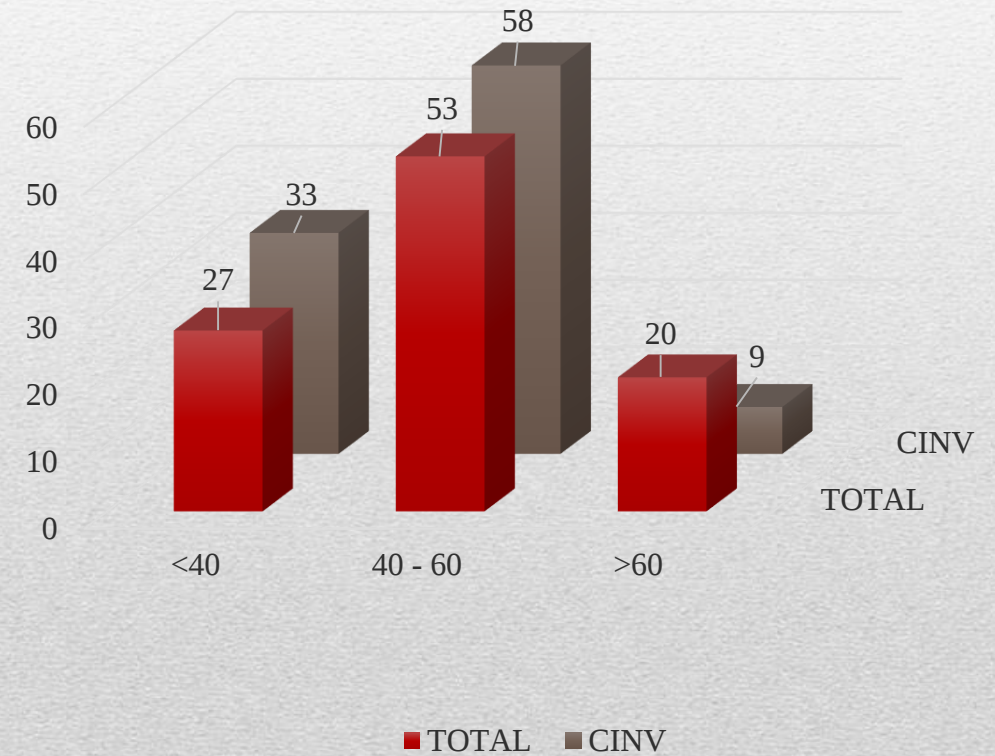
The external validity of the scoring systems were assessed using an area under the receiver operating characteristic curve (AUROC) analysis

# RESULTS

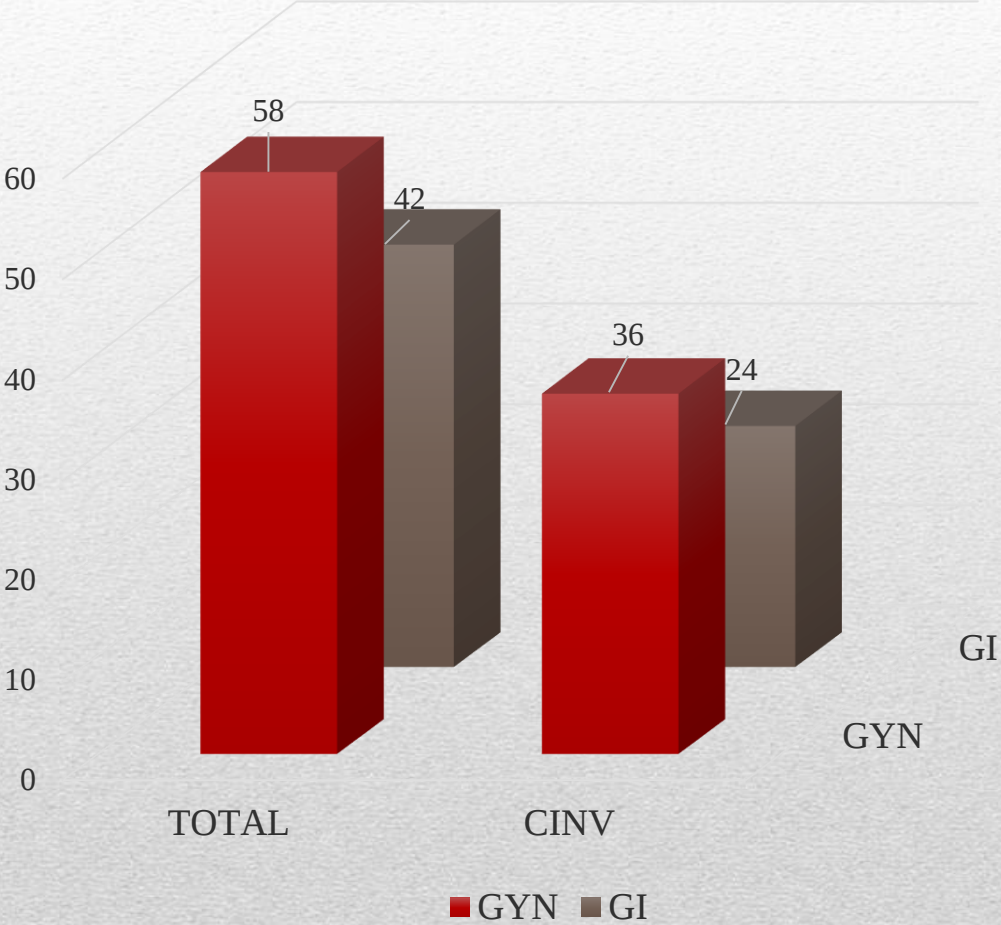
## GENDER DISTRIBUTION



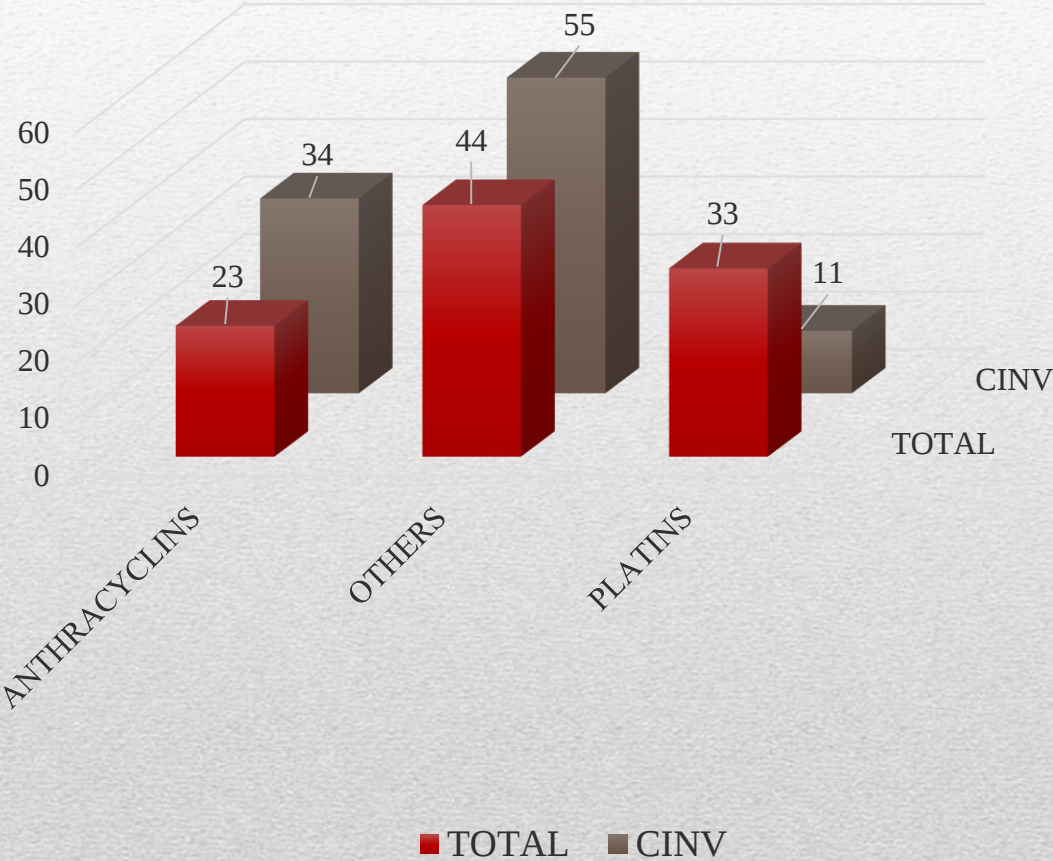
## AGE DISTRIBUTION



# DISTRIBUTION OF CANCERS

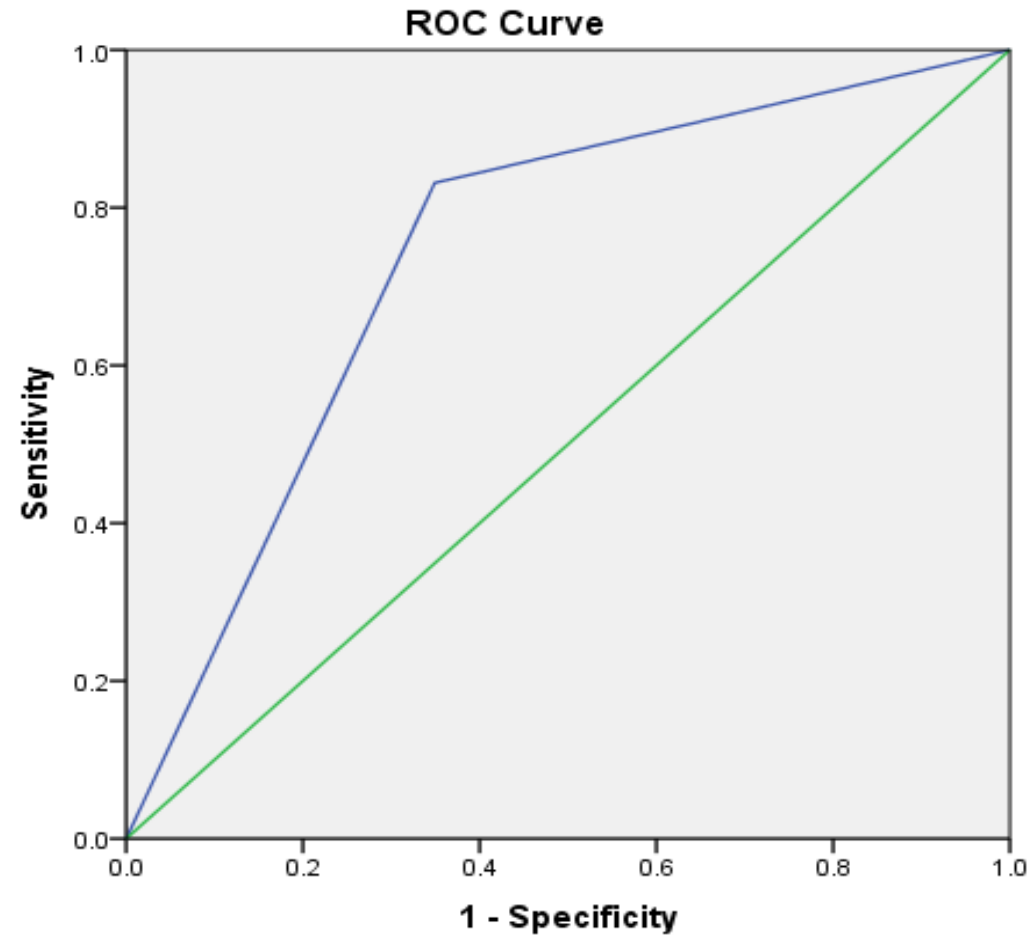


# TREATMENT OPTIONS



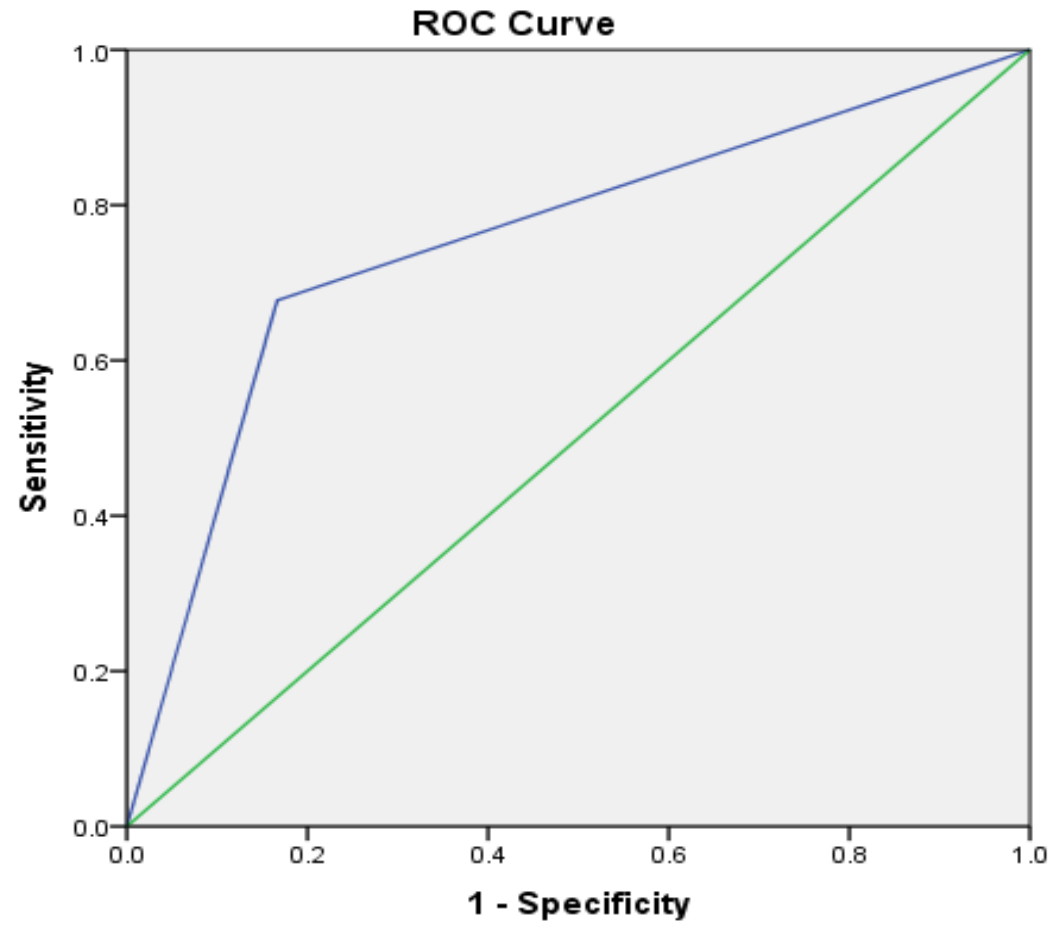
| Sl no.                                 | ACUTE       | DELAYED     |
|----------------------------------------|-------------|-------------|
| 1. Sensitivity                         | 83.1%       | 83.3%       |
| 2. Specificity                         | 65.1%       | 67.7%       |
| 3. Odds Ratio                          | 4.39        | 3.088       |
| <b>4. Area under the curve (AUROC)</b> | <b>0.75</b> | <b>0.71</b> |

# ACUTE CINV



Diagonal segments are produced by ties.

# DELAYED CINV



Diagonal segments are produced by ties.

# DISCUSSION

- Consequences of CINV
  - Oncologists pay less attention to potential patient risk factors
  - Identification of high risk patients helps initiate an action plan for early intervention
  - Low risk patients might be able to receive less anti-emetic therapy, sparing them the toxicities of those medications
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# DISCUSSION

- Patients identified to be at high risk for Acute CINV were 3.8 ( $p= 0.005$ ) times more likely to develop grade 2 or greater CINV
  - Patients identified to be at high risk for Delayed CINV were 6.6 ( $p= 0.002$ ) times more likely to develop grade 2 or greater CINV
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# CONCLUSION

- The study concludes that the Risk scoring algorithm is able to accurately identify patients at high risk for delayed CINV
  - The clinical application of the prediction tool will be an important source of individual patient risk information for the oncology clinician and may enhance patient care by optimizing the use of the antiemetics in a proactive manner
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# **LIMITATIONS**

- Smaller sample size
  - Patient data were obtained from only a single institution.
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# THANK YOU FOR LISTENING!

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