

# Prognostic Factors that Predict Durable Response and Survival with Salvage Radiosurgery for Brain Metastases



Goldie Kurtz<sup>1</sup>, Gelareh Zadeh<sup>2</sup>, Genevieve Gingras-Hill<sup>1</sup>, Barbara-Ann Millar<sup>1</sup>, Normand Laperriere<sup>1</sup>, Mark Bernstein<sup>2</sup>, Cynthia Ménard<sup>1</sup>, Caroline Chung<sup>1</sup>

<sup>1</sup>Department of Radiation Oncology, Princess Margaret Cancer Centre, Toronto, Ontario

<sup>2</sup>Department of Neurosurgery, Toronto Western Hospital, Toronto, Ontario

# Disclosures

- No conflicts to declare

# Introduction

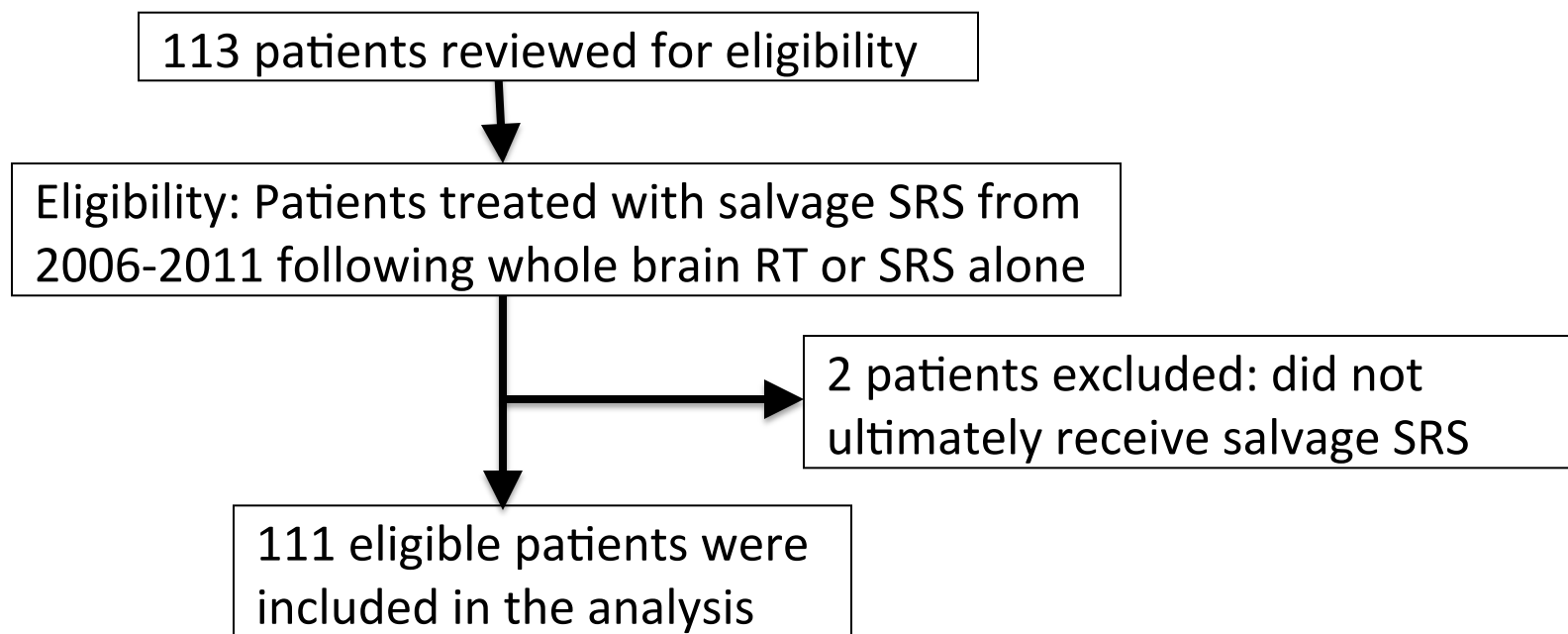
- At present, there are no guidelines for the role of salvage SRS and no criteria to guide selection of appropriate candidates for this salvage treatment<sup>1</sup>
- Particularly following prior whole brain radiotherapy, SRS may be offered more liberally with the aim of limiting toxicity of repeat whole brain radiation

# Purpose

- To evaluate the clinical outcomes following salvage SRS following prior brain radiotherapy (SRS and/or WBRT)
- To identify which patient, tumor, or treatment-related factors are predictive of better outcomes

# Methods: Patient Selection

- Retrospective review from an established prospective REB approved Brain Oligometastases Database



# Data Analysis

❖ **Data collection:** patient demographics (age, performance status, and extracranial control), tumor (histology), and treatment data (prior RT dose, fractionation, and timing; and salvage SRS dose)

❖ **Endpoints:**

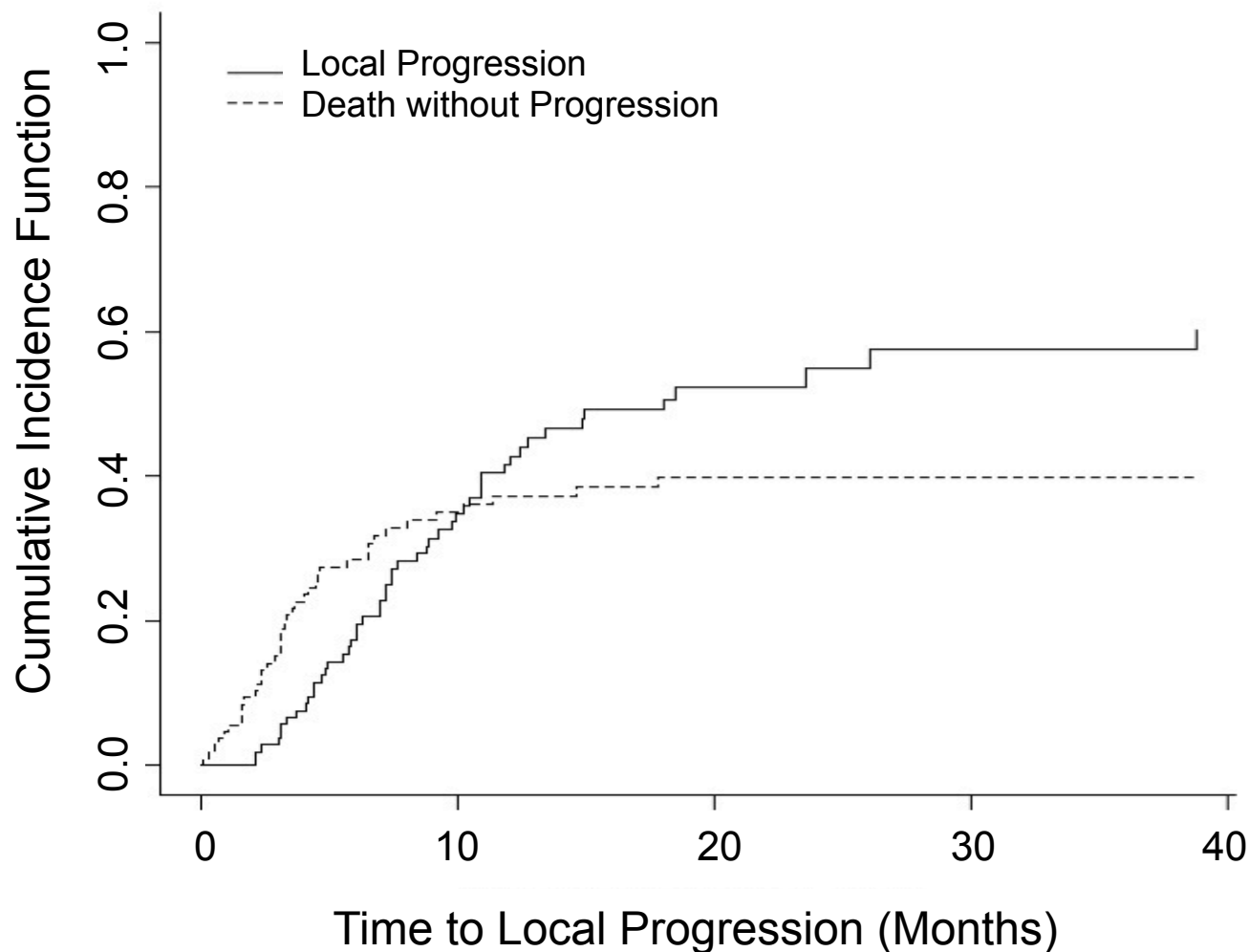
- LC = time from salvage SRS to first date of radiological progression of the treated tumor(s)
- PFS = time from salvage SRS to date of any intracranial progression or death
- OS = date of salvage SRS treatment to date of death

❖ **Statistical Analysis:** Univariate and multivariable analyses

# Patient Demographics at Salvage SRS

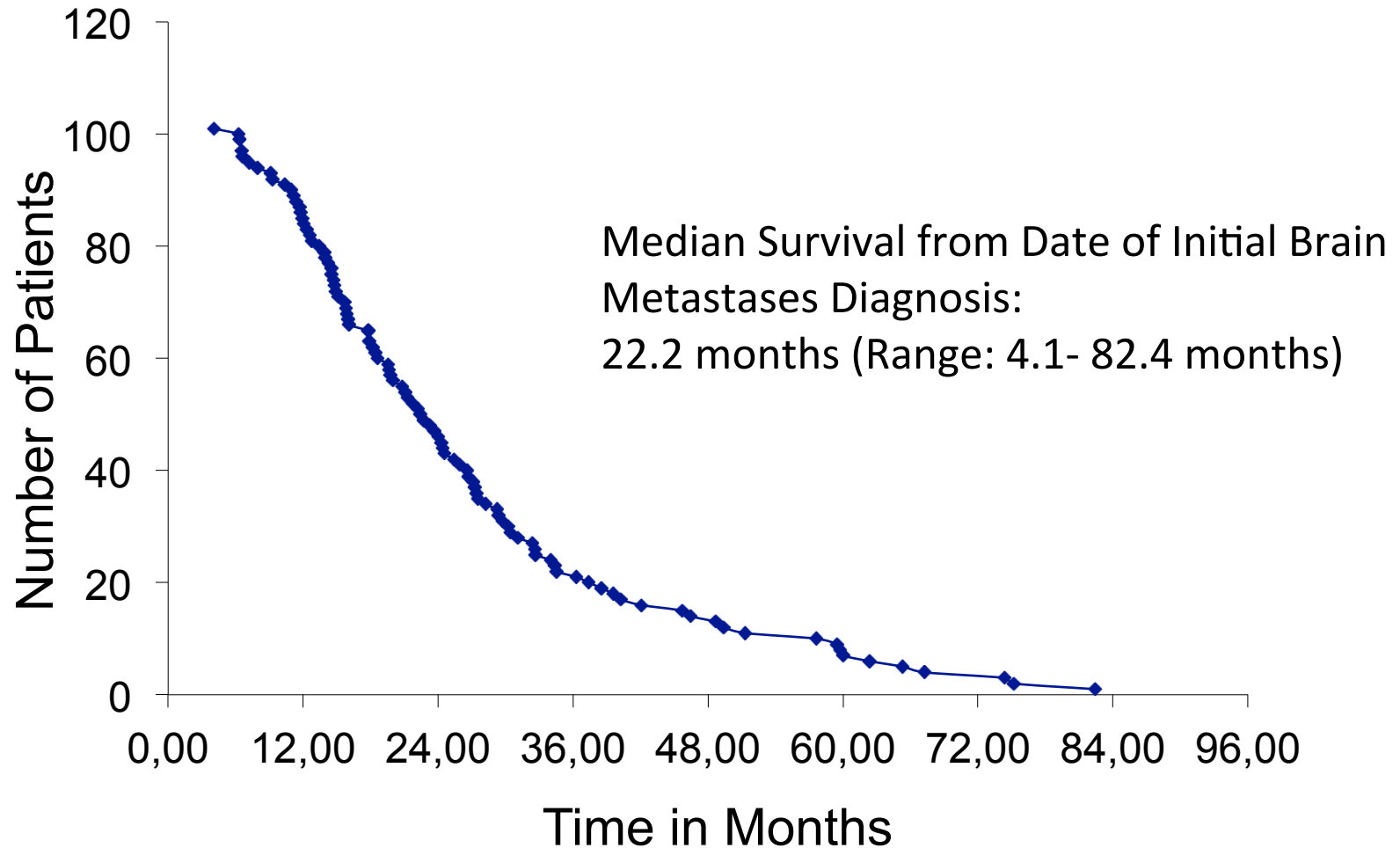
<b>Gender</b>	<b>Male: 33% Female: 67%</b>
<b>Age</b>	<b>Mean 57.9 years (range 32-88)</b>
<b>Histology</b>	<b>Lung: 49.6%</b> <b>Breast: 20.7%</b> <b>Other: 29.7%</b>
<b>Extracranial Disease Status</b>	<b>Controlled: 47.7%</b> <b>Uncontrolled: 33.3%</b> <b>Unspecified: 18.9%</b>
<b>Performance Status</b>	<b>ECOG 0 – 1: 78.4%</b> <b>ECOG 2 – 3: 14.4%</b> <b>Unspecified: 7.2%</b>
<b>Number of Metastases Treated</b>	<b>Mean: 2 per patient (range 1-12)</b>
<b>Dose Delivered per Metastasis</b>	<b>Median: 21 Gy (range 12-24 Gy)</b>
<b>Follow-up</b>	<b>Median: 241 days (range 0 – 2054)</b>

# Local Control of Mets Treated with Salvage SRS

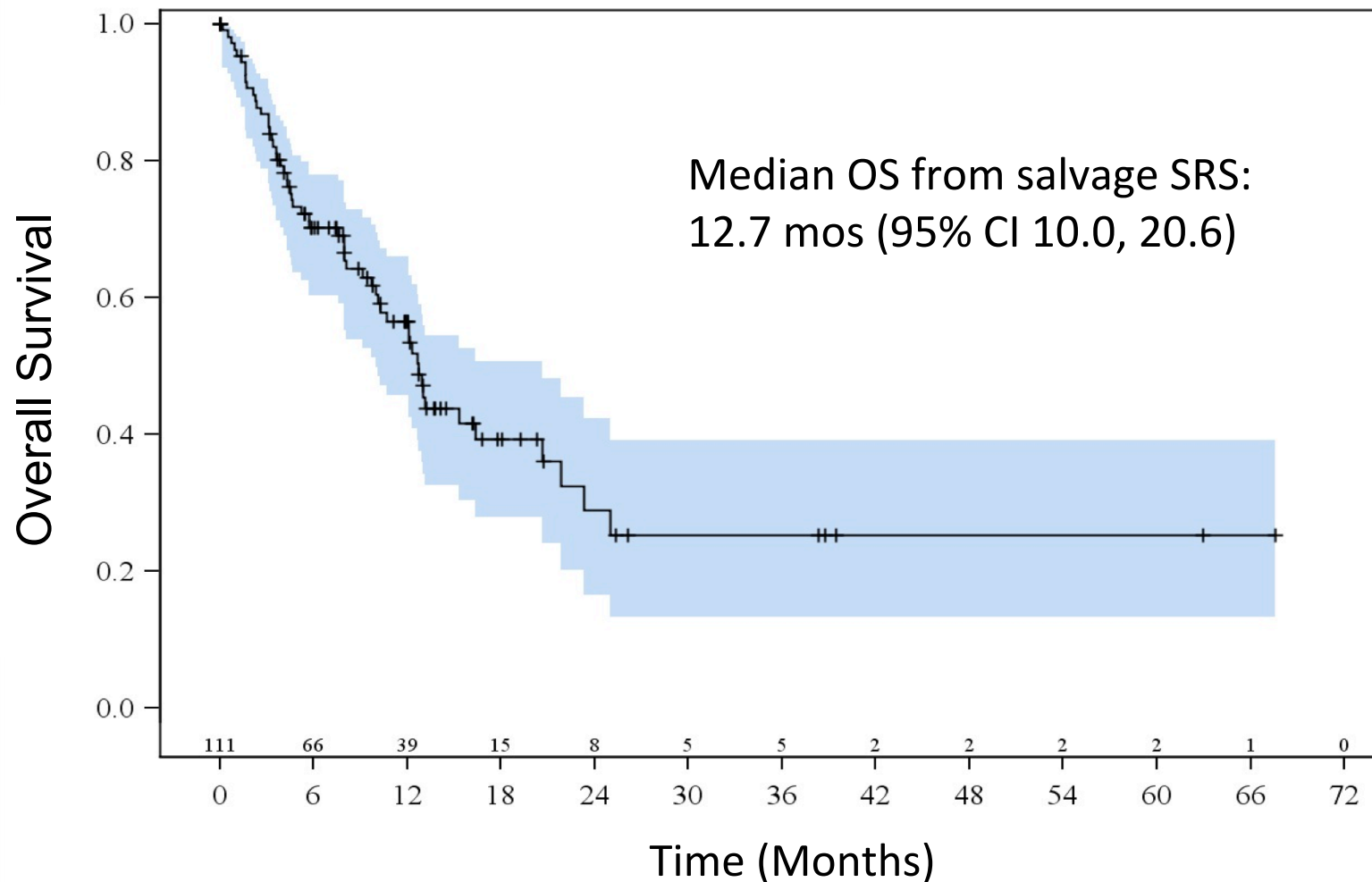




# Survival from Initial Diagnosis of Brain Metastasis



# Overall Survival Following Salvage SRS



# Summary of Outcomes Following Salvage SRS

<u>Time</u>	<u>OS</u>	<u>LC</u>	<u>PFS</u>
<b>6 mos</b>	70.2%	82.6%	52.5%
<b>1 yr</b>	56.5%	58.4%	21.7%
<b>2 yrs</b>	28.9%	45.2%	4.6%
<b>3 yrs</b>	25.3%	42.5%	2.3%

# Prognostic Factors Affecting Survival

<b>Variable</b>	<b>Multivariable Analysis <i>p</i>-value</b>
<b>Age</b>	<b>0.034</b>
<b>ECOG (0,1 vs. 2,3)</b>	<b>0.016</b>
<b>Extracranial Control</b>	<b>0.022</b>
<b>Intracranial Control</b>	<b>0.031</b>

# Discussion

- As patients survive longer with brain metastatic disease, the management of recurrent brain metastases is a growing challenge<sup>1</sup>
- In our study, salvage SRS was associated with prolonged survival and with durable local control
  - Median OS of 12.7 months from time of salvage SRS
  - 3-year OS: 25.3%
  - 2-year LC: 45%
- Further prospective investigations of salvage SRS for brain metastases should aim to measure its impact on QoL and treatment-related toxicity.

# Conclusions

Salvage SRS is an effective treatment for recurrent brain metastases, particularly in selected patients:

*Young patients with good performance status and controlled extracranial disease*



c

Thank you  
Questions

Int J Radiation Oncol Biol  
Phys 88(1):137-142, 2014