Concerning Rb, which of the following are true?

(Retinoblastoma)
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births **F**
Concerning Rb, which of the following are true?
- The incidence is roughly 1/100,000 live births
- How many new cases are there every year in North America?
  - About 300
  - Higher
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  \( F \)

**How many new cases are there every year in North America?**

About 250-300
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births

How many new cases are there every year in North America?
About 250-300

In the US, what two factors influence the age at which Rb is typically diagnosed?

- Whether there is a family hx of Rb
- Laterality; ie, whether the child has unilateral vs bilateral disease
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  

**How many new cases are there every year in North America?**

About 250-300

**In the US, what two factors influence the age at which Rb is typically diagnosed?**

--Whether there is a family hx of Rb
--Laterality; ie, whether the child has unilateral disease vs bilateral disease
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  

**How many new cases are there every year in North America?**
- About 250-300

**In the US, what two factors influence the age at which Rb is typically diagnosed?**
--- Whether there is a [family hx of Rb]
--- Laterality; ie, whether the child has unilateral disease vs bilateral disease

**In the US, at what age are the following usually diagnosed?**
--- Pt with a family hx of Rb:
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births **F**

**How many new cases are there every year in North America?**
About 250-300

*In the US, what two factors influence the age at which Rb is typically diagnosed?*
-- Whether there is a family hx of Rb
-- Laterality; ie, whether the child has unilateral disease vs bilateral disease

*In the US, at what age are the following usually diagnosed?*
-- Pt with a family hx of Rb: 4 months
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births **F**

How many new cases are there every year in North America? About 250-300

In the US, what two factors influence the age at which Rb is typically diagnosed?

- Whether there is a family hx of Rb
- Laterality; ie, whether the child has unilateral disease vs bilateral disease

In the US, at what age are the following usually diagnosed?

- Pt with a family hx of Rb: 4 months
- Pt with bilateral dz:
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births

How many new cases are there every year in North America?
About 250-300

In the US, what two factors influence the age at which Rb is typically diagnosed?
- Whether there is a family hx of Rb
- Laterality; ie, whether the child has unilateral disease vs bilateral disease

In the US, at what age are the following usually diagnosed?
- Pt with a family hx of Rb: 4 months
- Pt with bilateral dz: 12 months
Concerning Rb, which of the following are true?
- The incidence is roughly 1/100,000 live births

How many new cases are there every year in North America?
About 250-300

In the US, what two factors influence the age at which Rb is typically diagnosed?
- Whether there is a family hx of Rb
- Laterality; ie, whether the child has unilateral disease vs bilateral disease

In the US, at what age are the following usually diagnosed?
- Pt with a family hx of Rb: 4 months
- Pt with bilateral dz: 12 months
- Pt with unilateral dz:
Concerning Rb, which of the following are true?
- The incidence is roughly 1/100,000 live births

How many new cases are there every year in North America?
About 250-300

In the US, what two factors influence the age at which Rb is typically diagnosed?
--Whether there is a family hx of Rb
--Laterality; ie, whether the child has unilateral disease vs bilateral disease

In the US, at what age are the following usually diagnosed?
--Pt with a family hx of Rb: 4 months
--Pt with bilateral dz: 12 months
--Pt with unilateral dz: 24 months
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births **F**

- How many new cases are there every year in North America? About 250-300

- Is the rate in developing nations higher or lower?
Concerning Rb, which of the following are true?
- The incidence is roughly 1/100,000 live births

How many new cases are there every year in North America?
About 250-300

Is the rate in developing nations higher or lower?
Higher
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births **F**
- About 250-300 new cases every year in North America
- Is the rate in developing nations higher or lower? **Higher**
- Which two areas of the world have the highest Rb rates?

*How many new cases are there every year in North America?*

*About 250-300*
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births **F**

How many new cases are there every year in North America?
About 250-300

*Is the rate in developing nations higher or lower?*
Higher

*Which two areas of the world have the highest Rb rates?*
Africa and India
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  \textcolor{red}{F}
- About 60% represent nonheritable mutations  \textcolor{green}{T}

\text{14K} - 20K
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births **F**
- About 60% represent nonheritable mutations **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative)
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  **(F)**
- About 60% represent nonheritable mutations  **(T)**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)  **(F)**
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  **F**
- About 60% represent nonheritable mutations  **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{\circ}\) relative)  **F**

What percent of Rb pts have a positive family hx for the disease?
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  **F**
- About 60% represent nonheritable mutations  **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1<sup>o</sup> relative)  **F**

What percent of Rb pts have a positive family hx for the disease?  
5-10
Q

Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  
  (but not necessarily a 1\textsuperscript{o} relative)  
  \[ \text{14K - 20K} \]  
  \[ \text{F} \]

- About 60\% represent nonheritable mutations  
  \[ \text{T} \]

- To diagnose a case as 'heritable,' family history must be positive  
  \[ \text{F} \]

What percent of Rb pts have a positive family hx for the disease?

5-10

But 60\% of Rb pts have nonheritable disease. Shouldn't that mean 40\% have inherited disease?
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  \(14K \text{ - } 20K\)  \(\text{F}\)
- About 60% represent nonheritable mutations  \(\text{T}\)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\textsuperscript{o} relative)  \(\text{F}\)

What percent of Rb pts have a positive family hx for the disease?
5-10

But 60% of Rb pts have nonheritable disease. Shouldn't that mean 40% have inherited disease?
No, it means 40% have heritable disease
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( \text{F} \)
- About 60% represent nonheritable mutations \( \text{T} \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative) \( \text{F} \)

What percent of Rb pts have a positive family hx for the disease?
5-10

But 60% of Rb pts have nonheritable disease. Shouldn’t that mean 40% have inherited disease?
No, it means 40% have heritable disease

How can a disease be heritable if it’s not inherited?
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births (F)
- About 60% represent nonheritable mutations (T)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1º relative) (T need not)

What percent of Rb pts have a positive family hx for the disease? 5-10

But 60% of Rb pts have nonheritable disease. Shouldn't that mean 40% have inherited disease? No, it means 40% have heritable disease

How can a disease be heritable if it’s not inherited? A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( \text{F} \)
- About 60% represent nonheritable mutations \( \text{T} \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\textsuperscript{o} relative). \( \text{F} \)

What percent of Rb pts have a positive family hx for the disease?

5-10

But 60\% of Rb pts have nonheritable disease. Shouldn't that mean 40\% have inherited disease?

No, it means 40\% have heritable disease

How can a disease be heritable if it's not inherited?

A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40\% of pts with heritable (ie, germline) disease can be divided into 5-10\% who inherited the disease, and the 30-35\% who possess a new germline mutation.

What about the 60\% with nonheritable disease?
Concerning Rb, which of the following are true?

- The incidence is roughly 1/400,000 live births **F**
- About 60% represent nonheritable mutations **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative) **F**

**What percent of Rb pts have a positive family hx for the disease?**
5-10

**But 60% of Rb pts have nonheritable disease. Shouldn’t that mean 40% have inherited disease?**
No, it means 40% have heritable disease

**How can a disease be heritable if it’s not inherited?**
A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways—either it is inherited (i.e., present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (i.e., germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

**What about the 60% with nonheritable disease?**
In these case, mutagenesis occurred later, in non-germline (i.e., somatic) cells
All Rb cases

Basic hereditary division of cases

? ?

Let’s review the genetic basics of Rb…
Let’s review the genetic basics of Rb...
All Rb cases

- Basic hereditary division of cases
  - Nonheritable dz (60%)
  - Heritable dz (40%)

Let’s review the genetic basics of Rb…
All Rb cases

Nonheritable dz (60%)  Heritable dz (40%)

Let’s review the genetic basics of Rb…
Let’s review the genetic basics of Rb...
All Rb cases

- Nonheritable dz (60%)
- Heritable dz (40%)
  - New germline mutation (30-35%)
  - Inherited (5-10%)

Let’s review the genetic basics of Rb…
Let’s review the genetic basics of Rb…
All Rb cases

Basic hereditary division of cases

Nonheritable dz (60%)

Heritable dz (40%)

Basic division of heritable cases

New germline mutation (30-35%)

Inherited (5-10%)

Which form(s) is/are sporadic? Both of these.
Because sporadic cases occur in the absence of a family history, it is often assumed (incorrectly) that all sporadic cases are nonheritable. To the contrary, fully 30-35% of Rb cases are both sporadic and heritable.

Let’s review the genetic basics of Rb...
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- Patients with Rb are more likely to die of a second malignancy than of Rb itself

What percent of Rb pts have a positive family hx for the disease? About 10. But 60% of Rb pts have nonheritable disease. Shouldn’t that mean 40% have inherited disease? No, it means 40% have heritable disease.

How can a disease be heritable if it’s not inherited? A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease? In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.

OK, so some Rb pts have heritable disease, and others don’t. Other than implications for genetic counseling regarding having children, does it really matter?
OK, so some Rb pts have heritable disease, and others don’t. Other than implications for genetic counseling regarding having children, does it really matter? Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb cohort. In contrast, a strong majority of pts with heritable Rb have bilateral disease. Further, they are strongly predisposed to develop a host of different primary cancers throughout life.

How can a disease be heritable if it’s not inherited? A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways—either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease? In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1st relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- Patients with Rb are more likely to die of a second malignancy than of Rb itself

What percent of Rb pts have a positive family hx for the disease? About 10, but 60% of Rb pts have nonheritable disease. Shouldn’t that mean 40% have inherited disease? No, it means 40% have heritable disease.

How can a disease be heritable if it’s not inherited?
A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways—either it is inherited (i.e., present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (i.e., germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?
In these cases, mutagenesis occurred later, in non-germline (i.e., somatic) cells.
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- Patients with Rb are more likely to die of a second malignancy than of Rb itself

What percent of Rb pts have a positive family hx for the disease? About 10

But 60% of Rb pts have nonheritable disease. Shouldn’t that mean 40% have inherited disease? No, it means 40% have heritable disease. How can a disease be heritable if it’s not inherited?

A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease? In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.

OK, so some Rb pts have heritable disease, and others don't. Other than implications for genetic counseling regarding having children, does it really matter? Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb cohort. In contrast, a strong majority of pts with heritable Rb have bilateral disease. Further, they are strongly predisposed to develop a host of different primary cancers throughout life.

In addition to bilaterality, what other sort of presentation is associated with the heritable form of Rb? Multifocal disease; ie, multiple tumors within the same eye.
OK, so some Rb pts have heritable disease, and others don't. Other than implications for genetic counseling regarding having children, does it really matter?
Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb cohort. In contrast, a strong majority of pts with heritable Rb have bilateral disease. Further, they are strongly predisposed to develop a host of different primary cancers throughout life.

In addition to bilaterality, what other sort of presentation is associated with the heritable form of Rb?
Multifocal disease; ie, multiple tumors within the same eye

How can a disease be heritable if it's not inherited?
A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?
In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1st relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- Patients with Rb are more likely to die of a second malignancy than of Rb itself

What percent of Rb pts have a positive family hx for the disease? About 10%

But 60% of Rb pts have nonheritable disease. Shouldn't that mean 40% have inherited disease?

No, it means 40% have heritable disease. How can a disease be heritable if it’s not inherited?

A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?

In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.

OK, so some Rb pts have heritable disease, and others don’t. Other than implications for genetic counseling regarding having children, does it really matter?

Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb cohort. In contrast, a strong majority of pts with heritable Rb have bilateral disease. Further, they are strongly predisposed to develop a host of different primary cancers throughout life.

What percent of heritable Rb pts develop bilateral disease?
OK, so some Rb pts have heritable disease, and others don’t. Other than implications for genetic counseling regarding having children, does it really matter? Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb cohort. In contrast, a strong majority of pts with heritable Rb have bilateral disease. Further, they are strongly predisposed to develop a host of different primary cancers throughout life.

What percent of heritable Rb pts develop bilateral disease? About 85!

How can a disease be heritable if it’s not inherited? A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease? In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.
OK, so some Rb pts have heritable disease, and others don't. Other than implications for genetic counseling regarding having children, does it really matter? Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb cohort. In contrast, a strong majority of pts with heritable Rb have bilateral disease. Further, they are strongly predisposed to develop a host of different primary cancers throughout life.

**What percent of heritable Rb pts develop bilateral disease?**

About 85!

Note that this means 15% of heritable Rb pts have *unilateral* disease. Thus, unilateral disease is **not** pathognomonic for nonheritable Rb.

*How can a disease be heritable if it's not inherited?*

A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

*What about the 60% with nonheritable disease?*

In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- Patients with Rb are more likely to die of a second malignancy than of Rb itself

What percent of Rb pts have a positive family hx for the disease?

About 10

But 60% of Rb pts have nonheritable disease. Shouldn't that mean 40% have inherited disease?

No, it means 40% have heritable disease.

How can a disease be heritable if it’s not inherited?

A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?

In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.
OK, so some Rb pts have heritable disease, and others don’t. Other than implications for genetic counseling regarding having children, does it really matter? Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb cohort. In contrast, a strong majority of pts with heritable Rb have bilateral disease. Further, they are strongly predisposed to develop a host of different primary cancers throughout life.

What percent of heritable Rb pts develop bilateral disease? About 85%

Note that this means 15% of heritable Rb pts have *unilateral* disease. Thus, unilateral disease is **not** pathognomonic for nonheritable Rb.

What finding would strongly suggest that a child with unilateral Rb harbors a germline mutation? If s/he had *multifocal dz* within the affected eye

How can a disease be heritable if it’s not inherited? A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease? In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells
OK, so some Rb pts have heritable disease, and others don't. Other than implications for genetic counseling regarding having children, does it really matter? Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb cohort. In contrast, a strong majority of pts with heritable Rb have bilateral disease. Further, they are strongly predisposed to develop a host of different primary cancers throughout life.

What percent of heritable Rb pts develop bilateral disease? About 85!

What other forms of cancer are they predisposed to, and at what stage in life do these arise?
--Early childhood:
--Late childhood - teen years:
--Early adulthood:
--Later adulthood:

How can a disease be heritable if it's not inherited? A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease? In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.
OK, so some Rb pts have heritable disease, and others don't. Other than implications for genetic counseling regarding having children, does it really matter? Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb cohort. In contrast, a strong majority of pts with heritable Rb have bilateral disease. Further, they are strongly predisposed to develop a host of different primary cancers throughout life.

What percent of heritable Rb pts develop bilateral disease? About 85!

What other forms of cancer are they predisposed to, and at what stage in life do these arise?
--Early childhood: Midline intracranial tumors
--Late childhood - teen years:
--Early adulthood:
--Later adulthood:

How can a disease be heritable if it's not inherited?
A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?
In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.
OK, so some Rb pts have heritable disease, and others don't. Other than implications for genetic counseling regarding having children, does it really matter? Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb cohort. In contrast, a strong majority of pts with heritable Rb have bilateral disease. Further, they are strongly predisposed to develop a host of different primary cancers throughout life.

What percent of heritable Rb pts develop bilateral disease?
About 85%

What other forms of cancer are they predisposed to?
---Early childhood: Midline intracranial tumors
---Late childhood - teen years:
---Early adulthood:
---Later adulthood:

How can a disease be heritable if it’s not inherited?
A heritable disease is one that is coded for in germline cells of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?
In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1st relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- Patients with Rb are more likely to die of a second malignancy than of Rb itself

What percent of Rb pts have a positive family hx for the disease? About 10%

But 60% of Rb pts have nonheritable disease. Shouldn’t that mean 40% have inherited disease?

No, it means 40% have heritable disease.

How can a disease be heritable if it’s not inherited?

A heritable disease is one that is coded for in germline cells of two ways—either it is inherited (i.e., present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (i.e., germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?

In these case, mutagenesis occurred later, in non-germline (i.e., somatic) cells.

OK, so some Rb pts have heritable disease, and others don’t. Other than implications for genetic counseling regarding having children, does it really matter?

Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb cohort. In contrast, a strong majority of pts with heritable Rb have bilateral disease. Further, they are strongly predisposed to develop a host of different primary cancers throughout life.

What percent of heritable Rb pts develop bilateral?

About 85!

What other forms of cancer are they predisposed to?

---Early childhood: Midline intracranial tumors
---Late childhood - teen years:
---Early adulthood:
---Later adulthood:

How can a disease be heritable if it’s not inherited?

A heritable disease is one that is coded for in germline cells of two ways—either it is inherited (i.e., present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (i.e., germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?

In these case, mutagenesis occurred later, in non-germline (i.e., somatic) cells.

What specific midline structure is commonly involved?

The pineal gland (i.e., a pinealoma)
OK, so some Rb pts have heritable disease, and others don't. Other than implications for genetic counseling regarding having children, does it really matter? Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb cohort. In contrast, a strong majority of pts with heritable Rb have bilateral disease. Further, they are strongly predisposed to develop a host of different primary cancers throughout life.

What percent of heritable Rb pts develop bilateral? About 85!

What other forms of cancer are they predisposed to? 
---Early childhood: Midline intracranial tumors
---Late childhood - teen years:
---Early adulthood:
---Later adulthood:

How can a disease be heritable if it's not inherited? A heritable disease is one that is coded for in germline cells of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease? In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.

What specific midline structure is commonly involved? The pineal gland (ie, a pinealoma)

Histologically speaking, what does this tumor closely resemble? A retinoblastoma

A pt with bilateral retinoblastoma + a histologically similar pinealoma is often said to be suffering from what disease? 'Trilateral' retinoblastoma
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- Patients with Rb are more likely to die of a second malignancy than of Rb itself

What percent of Rb pts have a positive family hx for the disease?
About 10%

But 60% of Rb pts have nonheritable disease. Shouldn't that mean 40% have inherited disease?
No, it means 40% have heritable disease.

How can a disease be heritable if it's not inherited?
A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (i.e., present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (i.e., germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?
In these case, mutagenesis occurred later, in non-germline (i.e., somatic) cells.

OK, so some Rb pts have heritable disease, and others don't. Other than implications for genetic counseling regarding having children, does it really matter?
Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb cohort. In contrast, a strong majority of pts with heritable Rb have bilateral disease. Further, they are strongly predisposed to develop a host of different primary cancers throughout life.

What percent of heritable Rb pts develop bilateral?
About 85!

What other forms of cancer are they predisposed to?
--- Early childhood: Midline intracranial tumors
--- Late childhood - teen years:
--- Early adulthood:
--- Later adulthood:

How can a disease be heritable if it's not inherited?
A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (i.e., present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (i.e., germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What specific midline structure is commonly involved?
The pineal gland (i.e., a pinealoma)

Histologically speaking, what does this tumor closely resemble?
A retinoblastoma

What about the 60% with nonheritable disease?
In these case, mutagenesis occurred later, in non-germline (i.e., somatic) cells.
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- Patients with Rb are more likely to die of a second malignancy than of Rb itself

What percent of Rb pts have a positive family hx for the disease? About 10%

But 60% of Rb pts have nonheritable disease. Shouldn't that mean 40% have inherited disease?

No, it means 40% have heritable disease. How can a disease be heritable if it's not inherited?

A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?

In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.

OK, so some Rb pts have heritable disease, and others don’t. Other than implications for genetic counseling regarding having children, does it really matter?

Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb cohort. In contrast, a strong majority of pts with heritable Rb have bilateral disease. Further, they are strongly predisposed to develop a host of different primary cancers throughout life.

What percent of heritable Rb pts develop bilateral?

About 85%

What other forms of cancer are they predisposed to?

--Early childhood: Midline intracranial tumors
--Late childhood - teen years:
--Early adulthood:
--Later adulthood:

How can a disease be heritable if it’s not inherited?

A heritable disease is one that is coded for in germline cells. A heritable disease can be inherited (ie, present at conception) or occur as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What specific midline structure is commonly involved?

The pineal gland (ie, a pinealoma)

Histologically speaking, what does this tumor closely resemble?

A retinoblastoma

A pt with bilateral retinoblastoma + a histologically similar pinealoma is often said to be suffering from what condition?

What about the 60% with nonheritable disease?

In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.
OK, so some Rb pts have heritable disease, and others don’t. Other than implications for genetic counseling regarding having children, does it really matter? Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb cohort. In contrast, a strong majority of pts with heritable Rb have bilateral disease. Further, they are strongly predisposed to develop a host of different primary cancers throughout life.

What percent of heritable Rb pts develop bilateral disease? About 85!

What other forms of cancer are they predisposed to?

---Early childhood: Midline intracranial tumors
---Late childhood - teen years:
---Early adulthood:
---Later adulthood:

How can a disease be heritable if it’s not inherited? A heritable disease is one that is coded for in germline cells of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease? In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.

What specific midline structure is commonly involved? The pineal gland (ie, a pinealoma)

Histologically speaking, what does this tumor closely resemble? A retinoblastoma

A pt with bilateral retinoblastoma + a histologically similar pinealoma is often said to be suffering from what condition? ‘Trilateral’ retinoblastoma
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as ‘heritable,’ family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease
- Patients with Rb are more likely to die of a second malignancy than of Rb itself

What percent of Rb pts have a positive family hx for the disease? About 10%

But 60% of Rb pts have nonheritable disease. Shouldn’t that mean 40% have inherited disease?

No, it means 40% have heritable disease. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What other forms of cancer are they predisposed to?

--- Early childhood: Midline intracranial tumors
--- Late childhood - teen years:
--- Early adulthood:
--- Later adulthood:

How can a disease be heritable if it’s not inherited?

A heritable disease is one that is coded for in germline cells of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What percent of heritable Rb pts will develop a pinealoma?

About 2-3%

What specific midline structure is commonly involved?

The pineal gland (ie, a pinealoma)

Histologically speaking, what does this tumor closely resemble?

A retinoblastoma

A pt with bilateral retinoblastoma + a histologically similar pinealoma is often said to be suffering from what condition?

‘Trilateral’ retinoblastoma

What about the 60% with nonheritable disease?

In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1st relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- Patients with Rb are more likely to die of a second malignancy than of Rb itself

What percent of Rb pts have a positive family hx for the disease? About 10%

But 60% of Rb pts have nonheritable disease. Shouldn't that mean 40% have inherited disease? No, it means 40% have heritable disease. How can a disease be heritable if it's not inherited? A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (i.e., present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (i.e., germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease? In these case, mutagenesis occurred later, in non-germline (i.e., somatic) cells.

OK, so some Rb pts have heritable disease, and others don't. Other than implications for genetic counseling regarding having children, does it really matter? Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb cohort. In contrast, a strong majority of pts with heritable Rb have bilateral disease. Further, they are strongly predisposed to develop a host of different primary cancers throughout life.

What percent of heritable Rb pts will develop a pinealoma? About 2-3%

What specific midline structure is commonly involved? The pineal gland (i.e., a pinealoma)

Histologically speaking, what does this tumor closely resemble? A retinoblastoma

A pt with bilateral retinoblastoma + a histologically similar pinealoma is often said to be suffering from what condition? ‘Trilateral’ retinoblastoma

What other forms of cancer are they predisposed to? --Early childhood: Midline intracranial tumors
--Late childhood - teen years:
--Early adulthood:
--Later adulthood:

How can a disease be heritable if it’s not inherited?
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as ‘heritable,’ family history must be positive (but not necessarily a 1st relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease
- Patients with Rb are more likely to die of a second malignancy than of Rb itself

What percent of Rb pts have a positive family hx for the disease?
About 10%
But 60% of Rb pts have nonheritable disease. Shouldn't that mean 40% have inherited disease?
No, it means 40% have heritable disease

How can a disease be heritable if it’s not inherited?
A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?
In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells

OK, so some Rb pts have heritable disease, and others don’t. Other than implications for genetic counseling regarding having children, does it really matter?
Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb cohort. In contrast, a strong majority of pts with heritable Rb have bilateral disease. Further, they are strongly predisposed to develop a host of different primary cancers throughout life.

What percent of heritable Rb pts develop bilateral disease?
About 85!

What other forms of cancer are they predisposed to, and at what stage in life do these arise?
--Early childhood: Midline intracranial tumors
--Late childhood - teen years:
  --Early adulthood:
  --Later adulthood:

How can a disease be heritable if it’s not inherited?
A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?
In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births (T)
- About 60% represent nonheritable mutations (T)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative) (F)
- The exophytic type looks like Coats disease (T)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated (T)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) (T)
- Periodic MRI brain is warranted to detect early 'trilateral' disease (T)
- Patients with Rb are more likely to die of a second malignancy than of Rb itself (F)

What percent of Rb pts have a positive family hx for the disease? About 10%

But 60% of Rb pts have nonheritable disease. Shouldn't that mean 40% have inherited disease?
No, it means 40% have heritable disease.

How can a disease be heritable if it's not inherited?
A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?
In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.

OK, so some Rb pts have heritable disease, and others don't. Other than implications for genetic counseling regarding having children, does it really matter?
Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb cohort. In contrast, a strong majority of pts with heritable Rb have bilateral disease. Further, they are strongly predisposed to develop a host of different primary cancers throughout life.

What percent of heritable Rb pts develop bilateral disease?
About 85!

What other forms of cancer are they predisposed to, and at what stage in life do these arise?
--Early childhood: Midline intracranial tumors
--Late childhood - teen years: Sarcomas
--Early adulthood: 
--Later adulthood:

How can a disease be heritable if it's not inherited?
OK, so some Rb pts have heritable disease, and others don't. Other than implications for genetic counseling regarding having children, does it really matter?
Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb cohort. In contrast, a strong majority of pts with heritable Rb have bilateral disease. **Further, they are strongly predisposed to develop a host of different primary cancers throughout life.**

What percent of heritable Rb pts develop bilateral disease?
About 85!

**What other forms of cancer are they predisposed to, and at what stage in life do these arise?**
--Early childhood: Midline intracranial tumors
--Late childhood - teen years: Sarcomas
--Early adulthood:
--Later adulthood:

*How can a disease be heritable if it's not inherited?*
A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

*What about the 60% with nonheritable disease?*
In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.
OK, so some Rb pts have heritable disease, and others don't. Other than implications for genetic counseling regarding having children, does it really matter? Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb cohort. In contrast, a strong majority of pts with heritable Rb have bilateral disease. **Further, they are strongly predisposed to develop a host of different primary cancers throughout life.**

What percent of heritable Rb pts develop bilateral disease?
About 85!

**What other forms of cancer are they predisposed to, and at what stage in life do these arise?**
--Early childhood: Midline intracranial tumors
--Late childhood - teen years: Sarcomas
--Early adulthood: Melanoma; brain tumors
--Later adulthood:

*How can a disease be heritable if it's not inherited?*
A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

*What about the 60% with nonheritable disease?*
In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- Patients with Rb are more likely to die of a second malignancy than of Rb itself

What percent of Rb pts have a positive family hx for the disease?
About 10
But 60% of Rb pts have nonheritable disease. Shouldn't that mean 40% have inherited disease?
No, it means 40% have heritable disease
How can a disease be heritable if it's not inherited?
A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?
In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells

OK, so some Rb pts have heritable disease, and others don't. Other than implications for genetic counseling regarding having children, does it really matter?
Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb cohort. In contrast, a strong majority of pts with heritable Rb have bilateral disease. Further, they are strongly predisposed to develop a host of different primary cancers throughout life.

What percent of heritable Rb pts develop bilateral disease?
About 85!

What other forms of cancer are they predisposed to, and at what stage in life do these arise?
--Early childhood: Midline intracranial tumors
--Late childhood - teen years: Sarcomas
--Early adulthood: Melanoma; brain tumors
--Later adulthood:

How can a disease be heritable if it's not inherited?
A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?
In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells
OK, so some Rb pts have heritable disease, and others don't. Other than implications for genetic counseling regarding having children, does it really matter? Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb cohort. In contrast, a strong majority of pts with heritable Rb have bilateral disease. **Further, they are strongly predisposed to develop a host of different primary cancers throughout life.**

*What percent of heritable Rb pts develop bilateral disease?*
About 85!

**What other forms of cancer are they predisposed to, and at what stage in life do these arise?**
--Early childhood: Midline intracranial tumors
--Late childhood - teen years: Sarcomas
--Early adulthood: Melanoma; brain tumors
--Later adulthood: Lung cancer; bladder cancer

*How can a disease be heritable if it's not inherited?*
A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

*What about the 60% with nonheritable disease?*
In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1st relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- Patients with Rb are more likely to die of a second malignancy than of Rb itself

What percent of Rb pts have a positive family hx for the disease? About 10%

But 60% of Rb pts have nonheritable disease. Shouldn't that mean 40% have inherited disease? No, it means 40% have heritable disease.

How can a disease be heritable if it's not inherited? A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways—either it is inherited (i.e., present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (i.e., germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What is the rule-of-thumb for the rate at which germline Rb pts will get another (i.e., non-Rb) cancer?

- Early childhood: Midline intracranial tumors
- Late childhood - teen years: Sarcomas
- Early adulthood: Melanoma; brain tumors
- Later adulthood: Lung cancer; bladder cancer

How can a disease be heritable if it's not inherited?

In these case, mutagenesis occurred later, in non-germline (i.e., somatic) cells.
OK, so some Rb pts have heritable disease, and others don't. Other than implications for genetic counseling regarding having children, does it really matter?

Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb schoolmate cohort. Here's the thing:

**What is the rule-of-thumb for the rate at which germline Rb pts will get another (ie, non-Rb) cancer?**

1% per year. So ~10% will have developed a second cancer by age 10, 20% by age 20, 30% by age 30, etc.

--Early childhood: Midline intracranial tumors
--Late childhood - teen years: Sarcomas
--Early adulthood: Melanoma; brain tumors
--Later adulthood: Lung cancer; bladder cancer

How can a disease be heritable if it's not inherited?

A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?

In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.
OK, so some Rb pts have heritable disease, and others don't. Other than implications for genetic counseling regarding having children, does it really matter?

Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb schoolmates. In contrast, pts with heritable Rb have bilateral disease and a strong predisposition to develop a host of primary cancers throughout life.

What is the rule-of-thumb for the rate at which germline Rb pts will get another (ie, non-Rb) cancer?

1% per year. So ~10% will have developed a second cancer by age 10, 20% by age 20, 30% by age 30, etc.

What is the average age of diagnosis for...

Pinealoma?

--Early childhood: Midline intracranial tumors
--Late childhood - teen years: Sarcomas
--Early adulthood: Melanoma; brain tumors
--Later adulthood: Lung cancer; bladder cancer

How can a disease be heritable if it's not inherited?

A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?

In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells
OK, so some Rb pts have heritable disease, and others don't. Other than implications for genetic counseling regarding having children, does it really matter? Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb schoolmates. On the other hand, pts with heritable Rb have a higher risk of later developing other cancers.

**What is the rule-of-thumb for the rate at which germline Rb pts will get another (ie, non-Rb) cancer?** 1% per year. So ~10% will have developed a second cancer by age 10, 20% by age 20, 30% by age 30, etc.

**What is the average age of diagnosis for…**

**Pinealoma?** 3 years

**--Early childhood: Midline intracranial tumors**

--Late childhood - teen years: Sarcomas
--Early adulthood: Melanoma; brain tumors
--Later adulthood: Lung cancer; bladder cancer

**How can a disease be heritable if it’s not inherited?** A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

**What about the 60% with nonheritable disease?** In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- Patients with Rb are more likely to die of a second malignancy than of Rb itself

Q

OK, so some Rb pts have heritable disease, and others don't. Other than implications for genetic counseling regarding having children, does it really matter? Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb schoolmate cohort. All the other diseases are essentially the same.

What is the rule-of-thumb for the rate at which germline Rb pts will get another (ie, non-Rb) cancer? 1% per year. So ~10% will have developed a second cancer by age 10, 20% by age 20, 30% by age 30, etc.

What is the average age of diagnosis for…

- Pinealoma? 3 years
- Sarcoma?

--Early childhood: Midline intracranial tumors
--Late childhood - teen years: Sarcomas
--Early adulthood: Melanoma; brain tumors
--Later adulthood: Lung cancer; bladder cancer

How can a disease be heritable if it’s not inherited? A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease? In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- Patients with Rb are more likely to die of a second malignancy than of Rb itself

---

What percent of Rb pts have a positive family hx for the disease?

About 10% But 60% of Rb pts have nonheritable disease. Shouldn't that mean 40% have inherited disease?

No, it means 40% have heritable disease

How can a disease be heritable if it’s not inherited?

A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (i.e., present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (i.e., germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?

In these case, mutagenesis occurred later, in non-germline (i.e., somatic) cells

---

OK, so some Rb pts have heritable disease, and others don't. Other than implications for genetic counseling regarding having children, does it really matter?

Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of the non-Rb cohort. In contrast, a strong majority of pts with heritable Rb have bilateral disease. Further, they are strongly predisposed to develop a host of different primary cancers throughout life.

What is the rule-of-thumb for the rate at which germline Rb pts will get another (ie, non-Rb) cancer?

1% per year. So ~10% will have developed a second cancer by age 10, 20% by age 20, 30% by age 30, etc.

What is the average age of diagnosis for...

- Pinealoma? 3 years
- Sarcoma? 13 years

---

- Early childhood: Midline intracranial tumors
- Late childhood - teen years: Sarcomas
- Early adulthood: Melanoma; brain tumors
- Later adulthood: Lung cancer; bladder cancer

---

How can a disease be heritable if it’s not inherited?

A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (i.e., present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (i.e., germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?

In these case, mutagenesis occurred later, in non-germline (i.e., somatic) cells
OK, some Rb pts have heritable disease, and others don't. Other than implications for genetic counseling regarding having children, does it really matter? Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of the non-Rb cohort. In contrast, the strong majority of pts with heritable Rb have bilateral disease. Further, they are strongly predisposed to develop a host of different primary cancers throughout life.

What is the rule-of-thumb for the rate at which germline Rb pts will get another (ie, non-Rb) cancer? 1% per year. So ~10% will have developed a second cancer by age 10, 20% by age 20, 30% by age 30, etc.

What is the average age of diagnosis for...
- Pinealoma? 3 years
- Sarcoma? 13 years
- Melanoma?

--Early childhood: Midline intracranial tumors
--Late childhood - teen years: Sarcomas
--Early adulthood: Melanoma; brain tumors
--Later adulthood: Lung cancer; bladder cancer

How can a disease be heritable if it's not inherited? A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease? In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease
- Patients with Rb are more likely to die of a second malignancy than of Rb itself

What is the rule-of-thumb for the rate at which germline Rb pts will get another (ie, non-Rb) cancer? 1% per year. So ~10% will have developed a second cancer by age 10, 20% by age 20, 30% by age 30, etc.

What is the average age of diagnosis for…
- Pinealoma? 3 years
- Sarcoma? 13 years
- Melanoma? 27 years

---Early childhood: Midline intracranial tumors
---Late childhood - teen years: Sarcomas
---Early adulthood: Melanoma; brain tumors
---Later adulthood: Lung cancer; bladder cancer

OK, so some Rb pts have heritable disease, and others don’t. Other than implications for genetic counseling regarding having children, does it really matter? Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb siblings. Early death is rare to the point.

What is the rule-of-thumb for the rate at which germline Rb pts will get another (ie, non-Rb) cancer? 1% per year. So ~10% will have developed a second cancer by age 10, 20% by age 20, 30% by age 30, etc.

What is the average age of diagnosis for…
- Pinealoma? 3 years
- Sarcoma? 13 years
- Melanoma? 27 years

---Early childhood: Midline intracranial tumors
---Late childhood - teen years: Sarcomas
---Early adulthood: Melanoma; brain tumors
---Later adulthood: Lung cancer; bladder cancer

How can a disease be heritable if it’s not inherited? A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease? In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- Patients with Rb are more likely to die of a second malignancy than of Rb itself

What percent of Rb pts have a positive family hx for the disease? About 10%

But 60% of Rb pts have nonheritable disease. Shouldn't that mean 40% have inherited disease?

No, it means 40% have heritable disease. How can a disease be heritable if it’s not inherited?

A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?

In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.

What is the rule-of-thumb for the rate at which germline Rb pts will get another (ie, non-Rb) cancer?

1% per year. So ~10% will have developed a second cancer by age 10, 20% by age 20, 30% by age 30, etc.

What is the average age of diagnosis for…

- Pinealoma? 3 years
- Sarcoma? 13 years
- Melanoma? 27 years
- Carcinomas?

--Early childhood: Midline intracranial tumors
--Late childhood - teen years: Sarcomas
--Early adulthood: Melanoma; brain tumors
--Later adulthood: Lung cancer; bladder cancer

How can a disease be heritable if it’s not inherited?
OK, so some Rb pts have heritable disease, and others don't. Other than implications for genetic counseling regarding having children, does it really matter? Yes, very much. Pts with nonheritable Rb have unilateral disease, and once cured, have a lifetime cancer risk essentially identical to that of their non-Rb school classmates. In contrast, a strong majority of pts with heritable Rb have bilateral disease. Further, they are strongly predisposed to develop a host of different primary cancers throughout life.

What percent of heritable Rb pts develop bilateral disease? About 85%

What other forms of cancer are they predisposed to, and at what stage in life do these arise?
- **Early childhood:** Midline intracranial tumors
- **Late childhood - teen years:** Sarcomas
- **Early adulthood:** Melanoma; brain tumors
- **Later adulthood:** Lung cancer; bladder cancer

What is the rule-of-thumb for the rate at which germline Rb pts will get another (ie, non-Rb) cancer? 1% per year. So ~10% will have developed a second cancer by age 10, 20% by age 20, 30% by age 30, etc.

What is the average age of diagnosis for...
- Pinealoma? 3 years
- Sarcoma? 13 years
- Melanoma? 27 years
- Carcinomas? 29 years

---

How can a disease be heritable if it's not inherited? A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease? In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.
**Concerning Rb, which of the following are true?**

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)

**What percent of Rb pts have a positive family hx for the disease?**

About 10

But 60% of Rb pts have nonheritable disease. Shouldn’t that mean 40% have inherited disease?

No, it means 40% have heritable disease

**How can a disease be heritable if it’s not inherited?**

A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation.

In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

**What about the 60% with nonheritable disease?**

In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative)

Pedigree analysis reveals what sort of inheritance pattern in families with inherited Rb?
The inheritance pattern is consistent with autosomal dominant inheritance

What percent of Rb pts have a positive family hx for the disease?
About 10

But 60% of Rb pts have nonheritable disease. Shouldn’t that mean 40% have inherited disease? No, it means 40% have heritable disease

How can a disease be heritable if it’s not inherited?
A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?
In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- Need not

Pedigree analysis reveals what sort of inheritance pattern in families with inherited Rb?
The inheritance pattern is consistent with autosomal dominant inheritance

So Rb is an AD disease, then?

What percent of Rb pts have a positive family hx for the disease?
About 10

But 60% of Rb pts have nonheritable disease. Shouldn't that mean 40% have inherited disease?
No, it means 40% have heritable disease

How can a disease be heritable if it's not inherited?
A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?
In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)

Pedigree analysis reveals what sort of inheritance pattern in families with inherited Rb?

The inheritance pattern is consistent with autosomal dominant inheritance

So Rb is an AD disease, then?
No, it is unquestionably an autosomal recessive disease. Both copies of the responsible gene (RB1) must be faulty within a given cell before abnormal replication can begin.

What percent of Rb pts have a positive family hx for the disease?
About 10

But 60% of Rb pts have nonheritable disease. Shouldn’t that mean 40% have inherited disease?
No, it means 40% have heritable disease

How can a disease be heritable if it’s not inherited?
A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?
In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells
Pedigree analysis reveals what sort of inheritance pattern in families with inherited Rb?
The inheritance pattern is consistent with autosomal dominant inheritance

So Rb is an AD disease, then?
No, it is unquestionably an autosomal recessive disease. Both copies of the responsible gene (RB1) must be faulty within a given cell before abnormal replication can begin.

What percent of Rb pts have a positive family hx for the disease?
About 10

But 60% of Rb pts have nonheritable disease. Shouldn’t that mean 40% have inherited disease?
No, it means 40% have heritable disease

How can a disease be heritable if it’s not inherited?
A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?
In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells

What is the chromosomal location of the RB1 gene?
13q14
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)

Pedigree analysis reveals what sort of inheritance pattern in families with inherited Rb? The inheritance pattern is consistent with autosomal dominant inheritance.

So Rb is an AD disease, then? No, it is unquestionably an autosomal recessive disease. Both copies of the responsible gene (RB1) must be faulty within a given cell before abnormal replication can begin.

What is the chromosomal location of the RB1 gene? 13q14

What percent of Rb pts have a positive family hx for the disease? About 10

But 60% of Rb pts have nonheritable disease. Shouldn’t that mean 40% have inherited disease? No, it means 40% have heritable disease.

How can a disease be heritable if it’s not inherited? A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease? In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)

Pedigree analysis reveals what sort of inheritance pattern in families with inherited Rb?

- The inheritance pattern is consistent with autosomal dominant inheritance
- So Rb is an AD disease, then?
- No, it is unquestionably an autosomal recessive disease. Both copies of the responsible gene (RB1) must be faulty within a given cell before abnormal replication can begin.

The fact that it is the absence of a functioning copy of RB1 that leads to the development of RB indicates what about its nature?

What percent of Rb pts have a positive family hx for the disease?

- About 10

But 60% of Rb pts have nonheritable disease. Shouldn’t that mean 40% have inherited disease?

- No, it means 40% have heritable disease

How can a disease be heritable if it’s not inherited?

A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?

In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)

Pedigree analysis reveals what sort of inheritance pattern in families with inherited Rb?
The inheritance pattern is consistent with autosomal dominant inheritance

So Rb is an AD disease, then?
No, it is unquestionably an autosomal recessive disease. **Both copies of the responsible gene (RB1)** must be faulty within a given cell before abnormal replication can begin.

The fact that it is the absence of a functioning copy of RB1 that leads to the development of RB indicates what about its nature?
That it is a **tumor-suppressor gene**

What percent of Rb pts have a positive family hx for the disease?
About 10

But 60% of Rb pts have nonheritable disease. **Shouldn’t that mean 40% have inherited disease?**
No, it means 40% have heritable disease

**How can a disease be heritable if it’s not inherited?**
A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

**What about the 60% with nonheritable disease?**
In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)

Pedigree analysis reveals what sort of inheritance pattern in families with inherited Rb?
The inheritance pattern is consistent with autosomal dominant inheritance.

So Rb is an AD disease, then?
No, it is unquestionably an autosomal recessive disease. Both copies of the responsible gene (RB1) must be faulty within a given cell before abnormal replication can begin.

If Rb is AR, why does inherited disease present with an AD-like inheritance pattern?

What percent of Rb pts have a positive family hx for the disease?
About 10

But 60% of Rb pts have nonheritable disease. Shouldn’t that mean 40% have inherited disease?
No, it means 40% have heritable disease.

How can a disease be heritable if it’s not inherited?
A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways—either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?
In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.
What percent of Rb pts have a positive family hx for the disease?
About 10

But 60% of Rb pts have nonheritable disease. Shouldn’t that mean 40% have inherited disease?
No, it means 40% have heritable disease

How can a disease be heritable if it’s not inherited?
A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways—either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?
In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1st relative)

Pedigree analysis reveals what sort of inheritance pattern in families with inherited Rb?
The inheritance pattern is consistent with autosomal dominant inheritance

So Rb is an AD disease, then?
No, it is unquestionably an autosomal recessive disease. Both copies of the responsible gene (RB1) must be faulty within a given cell before abnormal replication can begin.

If Rb is AR, why does inherited disease present with an AD-like inheritance pattern?
In inherited disease, all cells contain one defective copy of RB1. In order for clinical Rb to develop, the other copy must be inactivated. Unfortunately, there are two factors that conspire to make this almost certain to occur in at least one retinoblast:
1) the number of different mutations that can occur is substantial, and
2) the sheer number of retinoblasts provides many opportunities for such a mutation to take place (remember, all that need happen for a tumor to develop is that ONE retinoblast lose its sole functioning copy of RB1).

What percent of Rb pts have a positive family hx for the disease?
About 10

But 60% of Rb pts have nonheritable disease. Shouldn’t that mean 40% have inherited disease?
No, it means 40% have heritable disease

How can a disease be heritable if it’s not inherited?
A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways—either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?
In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)

Pedigree analysis reveals what sort of inheritance pattern in families with inherited Rb?
The inheritance pattern is consistent with autosomal dominant inheritance

So Rb is an AD disease, then?
No, it is unquestionably an autosomal recessive disease. Both copies of the responsible gene (RB1)

Given the plethora of potential mutations and the large number of retinoblasts in which they have the opportunity to occur, what percent of pts with germline loss of one RB1 gene will lose the other one in at least one cell (and therefore will develop at least one tumor)?

- 1) the number of different mutations that can occur is substantial, and
- 2) the sheer number of retinoblasts provides many opportunities for such a mutation to take place (remember, all that need happen for a tumor to develop is that ONE retinoblast lose its sole functioning copy of RB1).

What percent of Rb pts have a positive family hx for the disease?
About 10

But 60% of Rb pts have nonheritable disease. Shouldn’t that mean 40% have inherited disease?
No, it means 40% have heritable disease

How can a disease be heritable if it’s not inherited?
A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?
In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as heritable, family history must be positive (but not necessarily a 1o relative)

Pedigree analysis reveals what sort of inheritance pattern in families with inherited Rb?
The inheritance pattern is consistent with autosomal dominant inheritance.

So Rb is an AD disease, then? No, it is unquestionably an autosomal recessive disease. Both copies of the responsible gene (RB1) need not.

Given the plethora of potential mutations and the large number of retinoblasts in which they have the opportunity to occur, what percent of pts with germline loss of one RB1 gene will lose the other one in at least one cell (and therefore will develop at least one tumor)? An astonishing 90-95%!

- 1) the number of different mutations that can occur is substantial, and
- 2) the sheer number of retinoblasts provides many opportunities for such a mutation to take place (remember, all that need happen for a tumor to develop is that ONE retinoblast lose its sole functioning copy of RB1).

What percent of Rb pts have a positive family hx for the disease? About 10

But 60% of Rb pts have nonheritable disease. Shouldn’t that mean 40% have inherited disease? No, it means 40% have heritable disease.

How can a disease be heritable if it’s not inherited? A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease? In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)

14K - 20K need not

What percent of Rb pts have a positive family hx for the disease?

- About 10
- But 60% of Rb pts have nonheritable disease. Shouldn't that mean 40% have inherited disease?

- No, it means 40% have heritable disease
- How can a disease be heritable if it's not inherited?

A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?

- In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells

Pedigree analysis reveals what sort of inheritance pattern in families with inherited Rb?

The inheritance pattern is consistent with autosomal dominant inheritance

So Rb is an AD disease, then?

- No, it is unquestionably an autosomal recessive disease. Both copies of the responsible gene (RB1)

Given the plethora of potential mutations and the large number of retinoblasts in which they have the opportunity to occur, what percent of pts with germline loss of one RB1 gene will lose the other one in at least one cell (and therefore will develop at least one tumor)?

An astonishing 90-95%!

1) the number of different mutations that can occur is substantial, and
2) the sheer number of retinoblasts provides many opportunities for such a mutation to take place (remember, all that need happen for a tumor to develop is that ONE retinoblast lose its sole functioning copy of RB1).

What percent of Rb pts have a positive family hx for the disease?

This also explains the relatively high rate of nonheritable (somatic) Rb. In a nonheritable disease pt, every retinoblast starts off with two intact copies of RB1. In order for such a person to develop Rb, at least one retinoblast must undergo mutations to both copies of RB1. For most AR diseases, the chances of this happening are very low. However, as mentioned above, the combination of a high number of potential mutations, plus the large population of retinoblasts, greatly increases the odds of this unfortunate occurrence.

What about the 60% with nonheritable disease?

In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as ‘heritable,’ family history must be positive (but not necessarily a 1o relative)

What percent of Rb pts have a positive family hx for the disease? About 10.

But 60% of Rb pts have nonheritable disease. Shouldn’t that mean 40% have inherited disease?

No, it means 40% have heritable disease. How can a disease be heritable if it’s not inherited?

A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways—either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?

In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.

Pedigree analysis reveals what sort of inheritance pattern in families with inherited Rb?

The inheritance pattern is consistent with autosomal dominant inheritance.

So Rb is an AD disease, then?

No, it is unquestionably an autosomal recessive disease. Both copies of the responsible gene (RB1) need not work for clinical disease to develop.

Given the plethora of potential mutations and the large number of retinoblasts in which they have the opportunity to occur, what percent of pts with germline loss of one RB1 gene will lose the other one in at least one cell (and therefore will develop at least one tumor)?

An astonishing 90-95%!  

Could this happen in both eyes of the same child? That is, can nonheritable Rb present bilaterally?

Yes--about 2% of bilateral Rb is of this sort.
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)

Pedigree analysis reveals what sort of inheritance pattern in families with inherited Rb?
The inheritance pattern is consistent with autosomal dominant inheritance

So Rb is an AD disease, then?
No, it is unquestionably an autosomal recessive disease. Both copies of the responsible gene (RB1) must have a mutation in order for Rb to develop.

Given the plethora of potential mutations and the large number of retinoblasts in which they have the opportunity to occur, what percent of pts with germline loss of one RB1 gene will lose the other one in at least one cell (and therefore will develop at least one tumor)?
An astonishing 90-95%!

What percent of Rb pts have a positive family hx for the disease?
About 10%
But 60% of Rb pts have nonheritable disease. Shouldn’t that mean 40% have inherited disease?
No, it means 40% have heritable disease. A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways—either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What percent of Rb pts have a positive family hx for the disease?
About 10%
But 60% of Rb pts have nonheritable disease. Shouldn’t that mean 40% have inherited disease?
No, it means 40% have heritable disease. A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways—either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?
In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells.
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  
- About 60% represent nonheritable mutations  
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)

What percent of Rb pts have a positive family hx for the disease?
- About 10%  
- But 60% of Rb pts have nonheritable disease. Shouldn't that mean 40% have inherited disease?
- No, it means 40% have heritable disease

How can a disease be heritable if it's not inherited?

A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways—either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?
- In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells

Given the plethora of potential mutations and the large number of retinoblasts in which they have the opportunity to occur, what percent of pts with germline loss of one RB1 gene will lose the other one in at least one cell (and therefore will develop at least one tumor)?

An astonishing 90-95%!

This also explains the relatively high rate of nonheritable (somatic) Rb. In a nonheritable disease pt, every retinoblast starts off with two intact copies of RB1. In order for such a person to develop Rb, at least one retinoblast must undergo mutations to both copies of RB1. For most AR diseases, the chances of this happening are very low. However, as mentioned above, the combination of a high number of potential mutations, plus the large population of retinoblasts, greatly increases the odds of this unfortunate occurrence.

Could this happen in both eyes of the same child? That is, can nonheritable Rb present bilaterally?
- Yes--about 2% of bilateral Rb is somatic/nonheritable in origin

What about the 60% with nonheritable disease?
- In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)

What percent of Rb pts have a positive family hx for the disease? About 10%

But 60% of Rb pts have nonheritable disease. Shouldn’t that mean 40% have inherited disease?

No, it means 40% have heritable disease. A heritable disease is one that is coded for in germline cells. A heritable disease enters the germline in one of two ways--either it is inherited (ie, present at conception), or occurs as a new, post-conception germline mutation. In Rb, the 40% of pts with heritable (ie, germline) disease can be divided into 5-10% who inherited the disease, and the 30-35% who possess a new germline mutation.

What about the 60% with nonheritable disease?

In these case, mutagenesis occurred later, in non-germline (ie, somatic) cells

OK, so some Rb pts have heritable disease, and others don't. Other than implications for genetic counseling regarding having children, does it really matter? Yes, very much. Pts with nonheritable Rb, once cured, have a lifetime cancer risk essentially identical to that of their non-Rb cohort. In contrast, a strong majority of pts with heritable Rb have bilateral disease. Further, they are strongly predisposed to develop a host of different primary cancers throughout life.

What percent of heritable Rb pts develop bilateral disease?

About 85%!

What other forms of cancer are they predisposed to, and at what stage in life do these arise?

- Early childhood: Midline intracranial tumors
- Late childhood - teen years: Sarcomas
- Early adulthood - middle age: Melanomas; brain tumors
- Late adult years: Lung cancer; bladder cancer

Could this happen in both eyes of the same child? That is, can nonheritable Rb present bilaterally?

Yes--about 2% of bilateral Rb is somatic/nonheritable in origin.

Recall this statement from an earlier slide—we’re now talking about “the other 2%”
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  **F**
- About 60% represent nonheritable mutations  **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative)  **F**
- The *exophytic* type looks like Coats disease  **F**
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births **F**
- About 60% represent nonheritable mutations **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative). **F**
- The *exophytic* type looks like Coats disease **T**
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births **F**
- About 60% represent nonheritable mutations **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative) **F**
- The **exophytic type** looks like Coats disease **T**

*The three presentation types are…*

--Exophytic
--
--
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \[ \text{F} \]
- About 60% represent nonheritable mutations \[ \text{T} \]
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\textsuperscript{o} relative) \[ \text{F} \]
- The \textit{exophytic type} looks like Coats disease \[ \text{T} \]

\textit{The three presentation types are…}

--Exophytic
--Endophytic
--Diffuse infiltrating
 Concerning Rb, which of the following are true?

- The incidence is roughly 1/400,000 live births. **F**
- About 60% represent nonheritable mutations. **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative). **F**
- The **exophytic type** looks like Coats disease. **T**

*The three presentation types are...and their respective growth patterns are...*

--**Exophytic:**
--Endophytic
--Diffuse infiltrating
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  \( F \)
- About 60% represent nonheritable mutations  \( T \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{\circ}\) relative)  \( F \)
- The **exophytic type** looks like Coats disease  \( T \)

*The three presentation types are...* and their respective growth patterns are...

---**Exophytic:** Subretinal growth

---**Endophytic**

---**Diffuse infiltrating**
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( F \)
- About 60% represent nonheritable mutations \( T \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\textsuperscript{st} relative) \( F \)
- The \textit{exophytic type} looks like Coats disease \( T \)

The three presentation types are...and their respective growth patterns are...
---Exophytic: Subretinal growth
---Endophytic
---Diffuse infiltrating

What does an exophytic tumor look like on DFE?
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( F \)
- About 60% represent nonheritable mutations \( T \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{st}\) relative) \( F \)
- The **exophytic type** looks like Coats disease \( T \)

---

The three presentation types are...and their respective growth patterns are...

--- Exophytic: Subretinal growth
--- Endophytic
--- Diffuse infiltrating

---

What does an exophytic tumor look like on DFE?

A yellow-white mass with retinal vessels coursing over it
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  \(14K - 20K\) \(F\)
- About 60% represent nonheritable mutations  \(T\)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{\circ}\) relative)  \(F\)
- The \textit{exophytic type} looks like Coats disease  \(T\)

The three presentation types are...and their respective growth patterns are...

- \textit{Exophytic: Subretinal growth}
- \textit{Endophytic}
- \textit{Diffuse infiltrating}

\textbf{What does an exophytic tumor look like on DFE?}

\textbf{A yellow-white \textbf{mass} with retinal vessels coursing over it}

\textbf{But Coats disease doesn’t include a mass, so how can these two conditions look alike?}
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  \( F \)
- About 60% represent nonheritable mutations  \( T \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\textsuperscript{st} relative)  \( F \)
- The \textbf{exophytic type} looks like Coats disease  \( T \)

The three presentation types are...and their respective growth patterns are...

- \textbf{Exophytic: Subretinal growth}
- Endophytic
- Diffuse infiltrating

What does an exophytic tumor look like on DFE?
A yellow-white \textbf{mass} with retinal vessels coursing over it

But Coats disease doesn’t include a mass, so how can these two conditions look alike? Exophytic tumors are frequently associated with exuberant subretinal fluid, which can obscure the tumor mass
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( F \)
- About 60% represent nonheritable mutations \( T \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\( \text{st} \) relative) \( F \)
- The **exophytic type** looks like Coats disease \( T \)

*The three presentation types are...and their respective growth patterns are...*

--Exophytic: Subretinal growth
--Endophytic:
--Diffuse infiltrating
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  \( F \)
- About 60% represent nonheritable mutations  \( T \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{\circ}\) relative)  \( F \)
- The **exophytic type** looks like Coats disease  \( T \)

*The three presentation types are...and their respective growth patterns are...*

--- Exophytic: Subretinal growth
--- **Endophytic**: Vertical, into-the-vitreous growth
--- Diffuse infiltrating
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \(14K-20K\) \(\text{F}\)
- About 60% represent nonheritable mutations \(T\)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative) \(F\)

- The **exophytic type** looks like Coats disease \(T\)

---

The three presentation types are...and their respective growth patterns are...

-- **Exophytic**: Subretinal growth
-- **Endophytic**: Vertical, into-the-vitreous growth
-- Diffuse infiltrating

---

What does 'into the vitreous' indicate about the relationship between the tumor and the retina?
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( \times \)  
  - About 60% represent nonheritable mutations \( \times \)
  - To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1st relative) \( \times \)
  - The **exophytic type** looks like Coats disease \( \checkmark \)

The three presentation types are...and their respective growth patterns are...

-- Exophytic: Subretinal growth
-- **Endophytic:** Vertical, into-the-vitreous growth
-- Diffuse infiltrating

What does 'into the vitreous' indicate about the relationship between the tumor and the retina?
It indicates that the tumor has broken through the internal limiting membrane
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  **F**
- About 60% represent nonheritable mutations  **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^\circ\) relative)  **F**
- The **exophytic type** looks like Coats disease  **T**

*The three presentation types are...and their respective growth patterns are...*

--Exophytic: Subretinal growth
--Endophytic: Vertical, into-the-vitreous growth
--Diffuse infiltrating:
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( \text{F} \)
- About 60% represent nonheritable mutations \( \text{T} \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{o}\) relative) \( \text{F} \)
- The \textbf{exophytic type} looks like Coats disease \( \text{T} \)

The three presentation types are…and their respective growth patterns are…
---Exophytic: Subretinal growth
---Endophytic: Vertical, into-the-vitreous growth
---\textbf{Diffuse infiltrating}: Lateral diffuse growth within the retina
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  \( F \)
- About 60% represent nonheritable mutations  \( T \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a \( 1^\circ \) relative)  \( F \)
- The **exophytic type** looks like Coats disease  \( T \)

The three presentation types are... and their respective growth patterns are...

--Exophytic: Subretinal growth
--Endophytic: Vertical, into-the-vitreous growth
--**Diffuse infiltrating**: Lateral diffuse growth within the retina

**Diffuse infiltrating Rb differs from its exo- and endophytic counterparts in many respects.** What are they?

--It is much less common ( \( \% \) of all Rb) than the other two forms
Concerning Rb, which of the following are true?

- The incidence is roughly 1/400,000 live births **F**
- About 60% represent nonheritable mutations **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative) **F**
- The *exophytic type* looks like Coats disease **T**

The three presentation types are...and their respective growth patterns are...
- Exophytic: Subretinal growth
- Endophytic: Vertical, into-the-vitreous growth
- **Diffuse infiltrating:** Lateral diffuse growth within the retina

*Diffuse infiltrating Rb differs from its exo- and endophytic counterparts in many respects. What are they?*  
--It is much less common ( <2% of all Rb) than the other two forms
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  \( F \)
- About 60% represent nonheritable mutations  \( T \) need not
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a \( 1^\circ \) relative)  \( F \)
- The **exophytic type** looks like Coats disease  \( T \)

---

**The three presentation types are...and their respective growth patterns are...**

-- Exophytic: Subretinal growth
-- Endophytic: Vertical, into-the-vitreous growth
-- **Diffuse infiltrating:** Lateral diffuse growth within the retina

*Diffuse infiltrating Rb differs from its exo- and endophytic counterparts in many respects. What are they?*

-- It is much **less** common (\(<2\%\) of all Rb) than the other two forms
-- It strikes **older vs. younger** children
Concerning Rb, which of the following are true?

- The incidence is roughly 1/400,000 live births $\text{F}$
- About 60% represent nonheritable mutations $\text{T}$
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative) $\text{F}$
- The **exophytic type** looks like Coats disease $\text{T}$

The three presentation types are...and their respective growth patterns are...

- Exophytic: Subretinal growth
- Endophytic: Vertical, into-the-vitreous growth
- **Diffuse infiltrating**: Lateral diffuse growth within the retina

Diffuse infiltrating Rb differs from its exo- and endophytic counterparts in many respects. What are they?

- It is much **less** common ( <2% of all Rb) than the other two forms
- It strikes **older** children ( >5 )
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( \pmb{F} \)
- About 60% represent nonheritable mutations \( \pmb{T} \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\textsuperscript{st} relative) \( \pmb{F} \)
- The \textit{exophytic type} looks like Coats disease \( \pmb{T} \)

\textbf{The three presentation types are...and their respective growth patterns are...}

--- Exophytic: Subretinal growth
--- Endophytic: Vertical, into-the-vitreous growth
--- **Diffuse infiltrating**: Lateral diffuse growth within the retina

**Diffuse infiltrating** Rb differs from its exo- and endophytic counterparts in many respects. What are they?

--- It is much \textbf{less} common (\(<2\%\) of all Rb) than the other two forms
--- It strikes \textbf{older} children (\(>5\))
--- It is virtually always \textbf{uni- v bilateral}
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( \text{F} \)
- About 60% represent nonheritable mutations \( \text{T} \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{\circ}\) relative) \( \text{F} \)
- The **exophytic type** looks like Coats disease \( \text{T} \)

The three presentation types are...and their respective growth patterns are...

- Exophytic: Subretinal growth
- Endophytic: Vertical, into-the-vitreous growth
- **Diffuse infiltrating**: Lateral diffuse growth within the retina

*Diffuse infiltrating Rb differs from its exo- and endophytic counterparts in many respects. What are they?*

- It is much **less** common (\(<2\%\) of all Rb) than the other two forms
- It strikes **older** children (\(>5\))
- It is virtually always **unilateral**
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births **F**
- About 60% represent nonheritable mutations **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative) **F**
- The **exophytic type** looks like Coats disease **T**

The three presentation types are...and their respective growth patterns are...
- Exophytic: Subretinal growth
- Endophytic: Vertical, into-the-vitreous growth
- **Diffuse infiltrating**: Lateral diffuse growth within the retina

*Diffuse infiltrating Rb differs from its exo- and endophytic counterparts in many respects. What are they?*
- It is much **less** common ( <2% of all Rb) than the other two forms
- It strikes **older** children ( >5 )
- It is virtually always **unilateral**
- It is virtually always...
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  (false)
- About 60% represent nonheritable mutations  (true)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\textsuperscript{st} relative)  (false)
- The \textit{exophytic type} looks like Coats disease  (true)

\textit{The three presentation types are...and their respective growth patterns are...}

- \textit{Exophytic:} Subretinal growth
- \textit{Endophytic:} Vertical, into-the-vitreous growth
- \textit{Diffuse infiltrating:} Lateral diffuse growth within the retina

\textit{Diffuse infiltrating Rb differs from its exo- and endophytic counterparts in many respects. What are they?}

- It is much \textbf{less} common ( \textless 2\% of all Rb) than the other two forms
- It strikes \textbf{older} children ( \textgreater 5 )
- It is virtually always \textbf{unilateral}
- It is virtually always \textbf{nonheritable}
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( \text{F} \)
- About 60% represent nonheritable mutations \( \text{T} \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative) \( \text{F} \)
- The **exophytic type** looks like Coats disease \( \text{T} \)

The three presentation types are...and their respective growth patterns are...

- Exophytic: Subretinal growth
- Endophytic: Vertical, into-the-vitreous growth
- **Diffuse infiltrating**: Lateral diffuse growth within the retina

*Diffuse infiltrating Rb differs from its exo- and endophytic counterparts in many respects. What are they?*

-- It is much **less** common ( <2% of all Rb) than the other two forms
-- It strikes **older** children ( >5 )
-- It is virtually always **unilateral**
-- It is virtually always **nonheritable**
-- It grows at a much **slower** rate than the other two forms
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( F \)
- About 60% represent nonheritable mutations \( T \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative) \( F \)
- The \textit{exophytic type} looks like Coats disease \( T \)

\textbf{The three presentation types are...and their respective growth patterns are...}
--Exophytic: Subretinal growth
--Endophytic: Vertical, into-the-vitreous growth
--\textbf{Diffuse infiltrating:} Lateral diffuse growth within the retina

\textit{Diffuse infiltrating Rb differs from its exo- and endophytic counterparts in many respects. What are they?}
--It is much \textbf{less} common ( \(<2\%\) of all Rb) than the other two forms
--It strikes \textbf{older} children ( \(>5\) )
--It is virtually always \textbf{unilateral}
--It is virtually always \textbf{nonheritable}
--It grows at a much \textbf{slower} rate than the other two forms
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( \text{F} \)
- About 60% represent nonheritable mutations \( \text{T} \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{o}\) relative) \( \text{F} \)
- The **exophytic type** looks like Coats disease \( \text{T} \)

---

*The three presentation types are... and their respective growth patterns are...*

- **Exophytic**: Subretinal growth
- **Endophytic**: Vertical, into-the-vitreous growth
- **Diffuse infiltrating**: Lateral diffuse growth within the retina

*Diffuse infiltrating Rb differs from its exo- and endophytic counterparts in many respects. What are they?*

- It is much **less** common ( 2\% of all Rb) than the other two forms
- It strikes **older** children ( >5 )
- It is virtually always **unilateral**
- It is virtually always **nonheritable**
- It grows at a much **slower** rate than the other two forms
- No distinct **tumor mass** is present (hence its name)
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( F \)
- About 60% represent nonheritable mutations \( T \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{\circ}\) relative) \( F \)
- The exophytic type looks like Coats disease \( T \)

The three presentation types are...and their respective growth patterns are...

-- Exophytic: Subretinal growth
-- Endophytic: Vertical, into-the-vitreous growth
-- Diffuse infiltrating: Lateral diffuse growth within the retina

**Diffuse infiltrating Rb differs from its exo- and endophytic counterparts in many respects. What are they?**

-- It is much **less** common ( \(<2\%\) of all Rb) than the other two forms
-- It strikes **older** children ( \(>5\) )
-- It is virtually always **unilateral**
-- It is virtually always **nonheritable**
-- It grows at a much **slower** rate than the other two forms
-- No distinct **tumor mass** is present (hence its name)
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  \( \text{F} \)
- About 60% represent nonheritable mutations  \( \text{T} \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{\circ}\) relative)  \( \text{F} \)
- The **exophytic type** looks like Coats disease  \( \text{T} \)

---

Diffuse infiltrating Rb differs from its exo- and endophytic counterparts in many respects. What are they?

- It is much **less** common ( <2\% of all Rb) than the other two forms
- It strikes **older** children ( >5 )
- It is virtually always **unilateral**
- It is virtually always **nonheritable**
- It grows at a much **slower** rate than the other two forms
- No distinct **tumor mass** is present (hence its name)
- **Calcification** is usually absent
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  \( \times \)
- About 60% represent nonheritable mutations  \( \checkmark \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{st}\) relative)  \( \times \)
- The exophytic type looks like Coats disease  \( \checkmark \)

*Diffuse infiltrating Rb differs from its exo- and endophytic counterparts in many respects. What are they?*

- It is much less common ( <2\% of all Rb) than the other two forms
- It strikes older children ( >5 )
- It is virtually always unilateral
- It is virtually always nonheritable
- It grows at a much slower rate than the other two forms
- No distinct tumor mass is present (hence its name)
- Calcification is usually absent
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( F \)
- About 60% represent nonheritable mutations \( T \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{\text{st}}\) relative) \( F \)
- The \textbf{exophytic type} looks like Coats disease \( T \)

\textbf{The three presentation types are...and their respective growth patterns are...}

--Exophytic: Subretinal growth
--Endophytic: Vertical, into-the-vitreous growth
--\textbf{Diffuse infiltrating:} Lateral diffuse growth within the retina

\textit{Diffuse infiltrating Rb differs from its exo- and endophytic counterparts in many respects. What are they?}

--It is much \textbf{less} common (\(<2\%\) of all Rb) than the other two forms
--It strikes \textbf{older} children (\(>5\))
--It is virtually always \textbf{unilateral}
--It is virtually always \textbf{nonheritable}
--It grows at a much \textbf{slower} rate than the other two forms
--No distinct \textbf{tumor mass} is present (hence its name)
--\textbf{Calcification} is usually absent
--It presents with a \textbf{red eye}, \textbf{AC cell/pseudohypopyon}, and \textbf{clumped vitreous cells}
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( \text{F} \)
- About 60% represent nonheritable mutations \( \text{T} \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{\circ}\) relative) \( \text{F} \)
- The exophytic type looks like Coats disease \( \text{T} \)

The three presentation types are...and their respective growth patterns are...

- Exophytic: Subretinal growth
- Endophytic: Vertical, into-the-vitreous growth
- **Diffuse infiltrating**: Lateral diffuse growth within the retina

Diffuse infiltrating Rb differs from its exo- and endophytic counterparts in many respects. What are they?

- It is much **less** common (\(<2\%\) of all Rb) than the other two forms
- It strikes **older** children (\(>5\))
- It is virtually always **unilateral**
- It is virtually always **nonheritable**
- It grows at a much **slower** rate than the other two forms
- No distinct **tumor mass** is present (hence its name)
- **Calcification** is usually absent
- It presents with a **red eye**, AC cell/pseudohypopyon, and **clumped vitreous cells**
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  \( \text{F} \)
- About 60% represent nonheritable mutations  \( \text{T} \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)  \( \text{F} \)
- The \textbf{exophytic type} looks like Coats disease  \( \text{T} \)

The three presentation types are...and their respective growth patterns are...

--Exophytic: Subretinal growth
--Endophytic: Vertical, into-the-vitreous growth

\textbf{Diffuse infiltrating:} Lateral diffuse growth within the retina

Diffuse infiltrating Rb differs from its exo- and endophytic counterparts in many respects. What are they?

--It is much less common ( <2% of all Rb) than the other two forms
--It strikes older children ( >5 )
--It is virtually always unilateral
--It is virtually always nonheritable

Diffuse infiltrating Rb \textit{is the form that can present as a uveitis 'masquerade syndrome' with vitritis and a pseudohypopyon}

--Calcification is usually absent
--It presents with a \textbf{red eye}, AC cell/pseudohypopyon, and \textbf{clumped vitreous cells}
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  F
- About 60% represent nonheritable mutations  T
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative)  F
- The **exophytic type** looks like Coats disease  T

The three presentation types are...and their respective growth patterns are...

- **Exophytic:** Subretinal growth
- **Endophytic:** Vertical, into-the-vitreous growth
- **Diffuse infiltrating:** Lateral diffuse growth within the retina

Diffuse infiltrating Rb is the form that can present as a uveitis ‘masquerade syndrome’ with vitritis and a **pseudohypopyon**

How does the pseudohypopyon of diffuse infiltrating Rb differ from a true inflammatory hypopyon?

- Unlike a hypopyon, the pseudohypopyon will shift easily with changes in head position
- The pseudohypopyon is **snow-white**, as opposed to the yellowish tinge of a true hypopyon
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  \( F \)
- About 60% represent nonheritable mutations  \( T \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{\circ}\) relative)  \( F \)
- The exophytic type looks like Coats disease  \( T \)

**The three presentation types are...and their respective growth patterns are...**
- Exophytic: Subretinal growth
- Endophytic: Vertical, into-the-vitreous growth
- **Diffuse infiltrating:** Lateral diffuse growth within the retina

**Diffuse infiltrating Rb is the form that can present as a uveitis 'masquerade syndrome' with vitritis and a pseudohypopyon**

- Calcification is usually absent
- It presents with a red eye, AC cell/pseudohypopyon, and clumped vitreous cells

**How does the pseudohypopyon of diffuse infiltrating Rb differ from a true inflammatory hypopyon?**
- Unlike a hypopyon, the pseudohypopyon will shift easily with changes in head position
- The pseudohypopyon is **snow-white**, as opposed to the **yellowish tinge** of a true hypopyon
Concerning Rb, which of the following are true?

- The incidence is roughly 1/400,000 live births **F**
- About 60% represent nonheritable mutations **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative) **F**
- The **exophytic type** looks like **Coats disease** **T**

What else do Coats dz and Rb have in common in terms of presentation?
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  **F**
- About 60% represent nonheritable mutations  **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative)  **F**
- The **exophytic type** looks like Coats disease  **T**

What else do Coats dz and Rb have in common in terms of presentation?
Both present with leukocoria
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( \times \)
- About 60% represent nonheritable mutations \( \checkmark \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{o}\) relative) \( \times \)
- The *exophytic type* looks like *Coats disease* \( \checkmark \)

*What else do Coats dz and Rb have in common in terms of presentation?*
Both present with leukocoria

*In what proportion of Rb pts is leukocoria the presenting sign?*
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births **F**
- About 60% represent nonheritable mutations **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative) **F**
- The **exophytic type** looks like Coats disease **T**

What else do Coats dz and Rb have in common in terms of presentation?
Both present with leukocoria

In what proportion of Rb pts is leukocoria the presenting sign?
About half
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  
  - F
- About 60% represent nonheritable mutations  
  - T
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative).  
  - F
- The *exophytic type* looks like Coats disease  
  - T

What else do Coats dz and Rb have in common in terms of presentation? Both present with *leukocoria*

*In what proportion of Rb pts is *leukocoria* the presenting sign?* About half

*What is the next-most common presenting sign?*
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( \text{F} \)
- About 60% represent nonheritable mutations \( \text{T} \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{st}\) relative) \( \text{F} \)
- The **exophytic type** looks like Coats disease \( \text{T} \)

*What else do Coats dz and Rb have in common in terms of presentation?*
Both present with **leukocoria**

*In what proportion of Rb pts is leukocoria the presenting sign?*
About half

*What is the next-most common presenting sign?*
Strabismus. *(Always consider Rb in infants who present with strabismus!)*
Leukocoria DDx:

Mnemonics forthcoming!
Q

Leukocoria DDx:

- Leukocoria
- Cataract
- Myelinated RNFL

Candidate mnemonic #1

LEUKOCORIA

Missing:
--
--
--

Candidate mnemonic #2

WHITE PUPIL

Missing:
--
--

This one includes more but leaves out one of the most important—Coats disease.

---Leukocoria

134
Leukocoria DDx:
- Rb
- Coats
- PHPV
- ROP
- FEVR
- Incontinentia pigmenti
- Cataract
- Uveitis
- Myelinated RNFL
- RD
- Toxocara

Candidate mnemonic #1:
- Lens problem (cataract)
- FEVR
- Uveitis
- K
- ROP
- Coats disease
- O
- Incontinentia pigmenti
- A

Candidate mnemonic #2:
- White (myelinated) RNFL
- HI
- Toxocara
- FEVR
- Rb
- PHPV
- Uveitis
- ROP
- Incontinentia pigmenti
- Lens problem (cataract)

Missing:
- PHPV
- Myelinated RNFL
- RD
- Toxocara

This one includes more but leaves out one of the most important—Coats disease
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  \( \textcolor{red}{F} \)
- About 60% represent nonheritable mutations  \( \textcolor{green}{T} \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\textsuperscript{o} relative)  \( \textcolor{red}{F} \)
- The \textit{exophytic} type looks like Coats disease  \( \textcolor{green}{T} \)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births **F**
- About 60% represent nonheritable mutations **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative) **F**
- The *exophytic* type looks like Coats disease **T**
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated **F**
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  **F**
- About 60% represent nonheritable mutations  **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{st}\) relative)  **F**
- The exophytic type looks like Coats disease  **T**
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  **F**

**Biopsy and/or FNA should be undertaken under only the most extraordinary of circumstances, when all other diagnostic maneuvers have proven futile. Why?**
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births **F**
- About 60% represent nonheritable mutations **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative) **F**
- The exophytic type looks like Coats disease **T**
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated **F**

**Biopsy and/or FNA should be undertaken under only the most extraordinary of circumstances, when all other diagnostic maneuvers have proven futile. Why? Because it incurs a significant risk of disseminating tumor cells**
Q

Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  \(\text{F}\)
- About 60% represent nonheritable mutations  \(\text{T}\)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{\circ}\) relative)  \(\text{T}\)
- The *exophytic* type looks like Coats disease  \(\text{T}\)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap should not be obtained if enucleation is being contemplated  \(\text{F}\)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)  \(\text{F}\)
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  **F**
- About 60% represent nonheritable mutations  **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(\circ\) relative)  **F**
- The *exophytic* type looks like Coats disease  **T**
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  **F**
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)  **F**
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as ‘heritable,’ family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)

In what way is CT superior to MRI in confirming the diagnosis of Rb?

CT is better able to detect intralesional calcifications.

In what way is MRI superior to CT?

Heritable Rb pts are at increased risk for developing cancers, and exposing them to even low-dose radiation (as occurs during CT scanning) poses an at least theoretical increase in that risk; MRI does not.

What three specific findings are you looking for on imaging?

--Extraocular extension--Optic nerve invasion--A pinealoma (ie, ‘trilateral disease’)
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  [T]
- About 60% represent nonheritable mutations  [F]
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1st relative)  [F]
- The exophytic type looks like Coats disease  [T]
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  [F]
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)  [F]

In what way is CT superior to MRI in confirming the diagnosis of Rb?
CT is better able to detect intralesional calcifications

In what way is MRI superior to CT?
Heritable Rb pts are at increased risk for developing cancers, and exposing them to even low-dose radiation (as occurs during CT scanning) poses an at least theoretical increase in that risk; MRI does not.

What three specific findings are you looking for on imaging?
-- Extraocular extension -- Optic nerve invasion -- A pinealoma (i.e., 'trilateral disease')
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)

In what way is CT superior to MRI in confirming the diagnosis of Rb? CT is better able to detect **intralesional calcifications**

What commonly-available alternative imaging technique is also effective for demonstrating intralesional calcifications?

What commonly-available alternative imaging technique is also effective for demonstrating intralesional calcifications?

B-scan ultrasonography
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)

In what way is CT superior to MRI in confirming the diagnosis of Rb? CT is better able to detect **intralesional calcifications**

What commonly-available alternative imaging technique is also effective for demonstrating intralesional calcifications? **B-scan ultrasonography**
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)

In what way is CT superior to MRI in confirming the diagnosis of Rb?
- CT is better able to detect intralesional calcifications

In what way is MRI superior to CT?
- Heritable Rb pts are at increased risk for developing cancers, and exposing them to even low-dose radiation (as occurs during CT scanning) poses an at least theoretical increase in that risk; MRI does not.

What three specific findings are you looking for on imaging?
- Extraocular extension
- Optic nerve invasion
- A pinealoma (ie, 'trilateral disease')
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  

- About 60% represent nonheritable mutations

- To diagnose a case as ‘heritable,’ family history must be positive (but not necessarily a 1o relative)

- The exophytic type looks like Coats disease

- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated

- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)

In what way is CT superior to MRI in confirming the diagnosis of Rb?
CT is better able to detect intralesional calcifications

In what way is MRI superior to CT?
Heritable Rb pts are at increased risk for developing cancers, and exposing them to even low-dose radiation (as occurs during CT scanning) poses an at least theoretical increase in that risk; MRI does not.
In what way is CT superior to MRI in confirming the diagnosis of Rb?
CT is better able to detect intralesional calcifications.

In what way is MRI superior to CT?
Heritable Rb pts are at increased risk for developing cancers, and exposing them to even low-dose radiation (as occurs during CT scanning) poses an at least theoretical increase in that risk; MRI does not. 

For this reason, MRI is now preferred over CT in the workup of Rb.

- The exophytic type looks like Coats disease  
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)

In what way is CT superior to MRI in confirming the diagnosis of Rb?
CT is better able to detect intralesional calcifications

In what way is MRI superior to CT?
Heritable Rb pts are at increased risk for developing cancers, and exposing them to even low-dose radiation (as occurs during CT scanning) poses an at least theoretical increase in that risk; MRI does not.

What three specific findings are you looking for on imaging?
- Extraocular extension
- Optic nerve invasion
- A pinealoma (ie, 'trilateral disease')
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as ‘heritable,’ family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)

In what way is CT superior to MRI in confirming the diagnosis of Rb?
CT is better able to detect intralesional calcifications.

In what way is MRI superior to CT?
Heritable Rb pts are at increased risk for developing cancers, and exposing them to even low-dose radiation (as occurs during CT scanning) poses an at least theoretical increase in that risk; MRI does not.

What three specific findings are you looking for on imaging?
- Extraocular extension
- Optic nerve invasion
- A pinealoma (i.e., ‘trilateral disease’)

The exophytic type looks like Coats disease.
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births **T**
- About 60% represent nonheritable mutations **F**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative) **F**
- The exophytic type looks like Coats disease **T**
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated **F**
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) **F**

In what way is CT superior to MRI in confirming the diagnosis of Rb? CT is better able to detect intralesional calcifications.

In what way is MRI superior to CT?

- Heritable Rb pts are at increased risk for developing cancers, and exposing them to even low-dose radiation (as occurs during CT scanning) poses an at least theoretical increase in that risk. MRI is superior.

What three specific findings should not be present if imaging reveals extraocular extension and/or optic nerve invasion?

- Extraocular extension
- Optic nerve invasion
- A pinealoma (ie, ‘trilateral disease’)

What needs to be undertaken if imaging reveals extraocular extension and/or optic nerve invasion?

- A metastatic workup
- Bone scan
- Lumbar puncture to check for tumor cells in the CSF
- Bone marrow biopsy to check for tumor cells

What does this entail?

- Bone scan
- Lumbar puncture
- Bone marrow biopsy
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as ‘heritable,’ family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)

In what way is CT superior to MRI in confirming the diagnosis of Rb?
CT is better able to detect intralesional calcifications.

In what way is MRI superior to CT?
Heritable Rb pts are at increased risk for developing cancers, and exposing them to even low-dose radiation (as occurs during CT scanning) poses an at least theoretical increase in that risk. MRI is superior.

What three specific findings should be looked for on imaging?
- Extraocular extension
- Optic nerve invasion
- A pinealoma (i.e., ‘trilateral disease’)

What needs to be undertaken if imaging reveals extraocular extension and/or optic nerve invasion?
A metastatic workup

- Bone scan
- Lumbar puncture to check for tumor cells in the CSF
- Bone marrow biopsy to check for tumor cells
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)

In what way is CT superior to MRI in confirming the diagnosis of Rb? CT is better able to detect intralesional calcifications.

In what way is MRI superior to CT? Heritable Rb pts are at increased risk for developing cancers, and exposing them to even low-dose radiation (as occurs during CT scanning) poses an at least theoretical increase in that risk. MRI is superior in that sense.

What three specific findings should not be missed on imaging?

- Extraocular extension
- Optic nerve invasion
- A pinealoma (i.e., ‘trilateral disease’)

What needs to be undertaken if imaging reveals extraocular extension and/or optic nerve invasion?

A metastatic workup

What does this entail?

- Bone scan
- Lumbar puncture to check for tumor cells in the CSF
- Bone marrow biopsy to check for tumor cells
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  
- About 60% represent nonheritable mutations  
- To diagnose a case as ‘heritable,’ family history must be positive (but not necessarily a 1o relative)  
- The exophytic type looks like Coats disease

- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)

In what way is CT superior to MRI in confirming the diagnosis of Rb?
CT is better able to detect intralesional calcifications

In what way is MRI superior to CT?

- Heritable Rb pts are at increased risk for developing cancers, and exposing them to even low-dose radiation (as occurs during CT scanning) poses an at least theoretical increase in that risk. MRI is superior.

What needs to be undertaken if imaging reveals extraocular extension and/or optic nerve invasion?
A metastatic workup

What does this entail?
- Bone scan
- Lumbar puncture to check for tumor cells in the CSF
- Bone marrow biopsy to check for tumor cells
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)

In what way is CT superior to MRI in confirming the diagnosis of Rb?
CT is better able to detect intralesional calcifications.

In what way is MRI superior to CT?
Heritable Rb pts are at increased risk for developing cancers, and exposing them to even low-dose radiation (as occurs during CT scanning) poses an at least theoretical increase in that risk. MRI images

What needs to be undertaken if imaging reveals extraocular extension and/or optic nerve invasion?
A metastatic workup

What does this entail?
- Bone scan
- Lumbar puncture to check for tumor cells in the CSF
- Bone marrow biopsy to check for tumor cells

What three specific findings are you looking for on imaging?
- Extraocular extension
- Optic nerve invasion
- A pinealoma (i.e., “trilateral disease”)

What is the most common mechanism by which Rb escapes the eye?
Direct extension via the optic nerve, which allows access to the subarachnoid space.
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births (T)
- About 60% represent nonheritable mutations (F)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative) (T)
- The exophytic type looks like Coats disease (T)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated (F)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) (F)

In what way is CT superior to MRI in confirming the diagnosis of Rb?
CT is better able to detect intrallesional calcifications

In what way is MRI superior to CT?
Heritable Rb pts are at increased risk for developing cancers, and exposing them to even low-dose radiation (as occurs during CT scanning) poses an at least theoretical increase in that risk. MRI is preferred.

What three specific findings are you looking for on imaging?
- Extraocular extension
- Optic nerve invasion
- A pinealoma (i.e., 'trilateral disease')

What needs to be undertaken if imaging reveals extraocular extension and/or optic nerve invasion?
A metastatic workup

What does this entail?
- Bone scan
- Lumbar puncture to check for tumor cells in the CSF
- Bone marrow biopsy to check for tumor cells

What is the most common mechanism by which Rb escapes the eye?
Direct extension via the optic nerve, which allows access to the subarachnoid space.
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  \( F \)
- About 60% represent nonheritable mutations  \( T \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{o}\) relative)  \( F \)
- The *exophytic* type looks like Coats disease  \( T \)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  \( F \)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)  \( F \)
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease

14K - 20K need not
should not
• Concerning Rb, which of the following are true?
  • The incidence is roughly 1/100,000 live births \[\mathbf{F}\]
  • About 60% represent nonheritable mutations \[\mathbf{T}\]
  • To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative) \[\mathbf{F}\]
  • The \textit{exophytic} type looks like Coats disease \[\mathbf{T}\]
  • Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated \[\mathbf{F}\]
  • CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) \[\mathbf{F}\]
  • Periodic MRI brain is warranted to detect early ‘trilateral’ disease \[\mathbf{F}\]
Q

Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births **F**
- About 60% represent nonheritable mutations **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative) **F**
- The exophytic type looks like Coats disease **T**
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated **F**
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) **F**
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease **F**

**Why isn’t periodic MRI surveillance for midline intracranial tumors warranted?**
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births **F**
- About 60% represent nonheritable mutations **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative) **F**
- The exophytic type looks like Coats disease **T**
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated **F**
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) **F**
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease **F**

Why isn’t periodic MRI surveillance for midline intracranial tumors warranted? Because early detection has not been shown to prolong survival
Q

Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  **F**
- About 60% represent nonheritable mutations  **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative)  **F**
- The *exophytic* type looks like Coats disease  **T**
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  **F**
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)  **F**
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease  **F**

*Why isn’t periodic MRI surveillance for midline intracranial tumors warranted?*

Because early detection has not been shown to prolong survival

*What is the average life expectancy after diagnosis of such a tumor?*
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \(^{F}\)
- About 60% represent nonheritable mutations \(^{T}\)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{o}\) relative) \(^{F}\)
- The exophytic type looks like Coats disease \(^{T}\)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated \(^{F}\)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) \(^{F}\)
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease \(^{F}\)

Why isn’t periodic MRI surveillance for midline intracranial tumors warranted?
Because early detection has not been shown to prolong survival

What is the average life expectancy after diagnosis of such a tumor?
About 9 months
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births **F**
- About 60% represent nonheritable mutations **T**  
  need not

- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1º relative) **F**
- The *exophytic* type looks like Coats disease **T**

- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated **F**
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) **F**
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease **F**
- The Reese-Ellsworth classification system is the current preferred method for staging Rb

14K - 20K

not

should not

^
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  F
- About 60% represent nonheritable mutations  T
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1º relative)  F
- The *exophytic* type looks like Coats disease  T
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  F
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)  F
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease  F
- The Reese-Ellsworth classification system is the current preferred method for staging Rb  F
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( F \)
- About 60% represent nonheritable mutations \( T \)
- To diagnose a case as 'heritable,' family history must be positive \( T \)
- The exophytic type looks like Coats disease \( T \)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated \( F \)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) \( T \)
- Periodic MRI brain is warranted to detect early 'trilateral' disease \( F \)
- The Reese-Ellsworth classification system is the current preferred method for staging Rb \( F \)

The Reese-Ellsworth classification system was the standard for many years. Why has it fallen out of favor?

The Reese-Ellsworth system was based on the assumption that the primary treatment modality was external-beam radiation therapy (XBRT). Now that XBRT is no longer the first-line treatment for most cases of Rb, the Reese-Ellsworth system is not as useful.

Did XBRT fall out of favor because it was ineffective?

No, it was quite effective—Rb is highly vulnerable to radiation therapy. If not a lack of efficacy, then why did XBRT fall from favor?

Because it significantly increases the risk of secondary malignancies later in life.
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  
  - F
- About 60% represent nonheritable mutations  
  - T
- To diagnose a case as 'heritable,' family history must be positive  
  - F
- The exophytic type looks like Coats disease  
  - T
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  
  - F
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)  
  - T
- Periodic MRI brain is warranted to detect early 'trilateral' disease  
  - F
- The Reese-Ellsworth classification system is the current preferred method for staging Rb  
  - F

The Reese-Ellsworth classification system was the standard for many years. Why has it fallen out of favor?
The Reese-Ellsworth system was based on the assumption that the primary treatment modality was  

- four words (and their abb.)  
  - Now that  
  - abb.  

...is no longer the first-line treatment for most cases of Rb, the Reese-Ellsworth system is not as useful.
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( F \)
- About 60% represent nonheritable mutations \( T \)

The Reese-Ellsworth classification system was the standard for many years. Why has it fallen out of favor?

The Reese-Ellsworth system was based on the assumption that the primary treatment modality was external-beam radiation therapy (XBRT). Now that XBRT is no longer the first-line treatment for most cases of Rb, the Reese-Ellsworth system is not as useful.

- The Reese-Ellsworth classification system is the current preferred method for staging Rb \( F \)
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births **F**
- About 60% represent nonheritable mutations **T**
- To diagnose a case as ‘heritable,’ family history must be positive **F**
- The exophytic type looks like Coats disease **T**
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated **F**
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) **T**
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease **F**
- The Reese-Ellsworth classification system is the current preferred method for staging Rb **F**

---

The Reese-Ellsworth classification system was the standard for many years. Why has it fallen out of favor?

The Reese-Ellsworth system was based on the assumption that the primary treatment modality was external-beam radiation therapy (XBRT). Now that XBRT is no longer the first-line treatment for most cases of Rb, the Reese-Ellsworth system is not as useful.

Did XBRT fall out of favor because it was ineffective?

The Reese-Ellsworth classification system is the current preferred method for staging Rb **F**
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  \( \text{F} \)
- About 60% represent nonheritable mutations  \( \text{T} \)
- To diagnose a case as ‘heritable,’ family history must be positive (but not necessarily a 1o relative)  \( \text{F} \)
- The exophytic type looks like Coats disease  \( \text{T} \)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  \( \text{F} \)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)  \( \text{T} \)
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease  \( \text{F} \)
- The Reese-Ellsworth classification system is the current preferred method for staging Rb  \( \text{F} \)

The Reese-Ellsworth classification system was the standard for many years. Why has it fallen out of favor?

The Reese-Ellsworth system was based on the assumption that the primary treatment modality was external-beam radiation therapy (XBRT). Now that XBRT is no longer the first-line treatment for most cases of Rb, the Reese-Ellsworth system is not as useful.

Did XBRT fall out of favor because it was ineffective?

No, it was quite effective--Rb is highly vulnerable to radiation therapy

Did XBRT fall out of favor because it was ineffective?

No, it was quite effective--Rb is highly vulnerable to radiation therapy

Did XBRT fall out of favor because it was ineffective?

No, it was quite effective--Rb is highly vulnerable to radiation therapy

The Reese-Ellsworth classification system was the standard for many years. Why has it fallen out of favor?

The Reese-Ellsworth system was based on the assumption that the primary treatment modality was external-beam radiation therapy (XBRT). Now that XBRT is no longer the first-line treatment for most cases of Rb, the Reese-Ellsworth system is not as useful.
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( \times \) **F**
- About 60% represent nonheritable mutations \( \checkmark \)
- To diagnose a case as 'heritable,' family history must be positive \( \times \)
- The exophytic type looks like Coats disease \( \checkmark \)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated \( \times \)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) \( \checkmark \)
- Periodic MRI brain is warranted to detect early 'trilateral' disease \( \times \)
- The Reese-Ellsworth classification system is the current preferred method for staging Rb \( \times \)

---

The Reese-Ellsworth classification system was the standard for many years. Why has it fallen out of favor?

The Reese-Ellsworth system was based on the assumption that the primary treatment modality was external-beam radiation therapy (XBRT). Now that XBRT is no longer the first-line treatment for most cases of Rb, the Reese-Ellsworth system is not as useful.

Did XBRT fall out of favor because it was ineffective?
No, it was quite effective--Rb is highly vulnerable to radiation therapy

If not a lack of efficacy, then why did XBRT fall from favor?

The Reese-Ellsworth classification system was no longer the current preferred method for staging Rb.
Concerning Rb, which of the following are true?

- The incidence is roughly 1/400,000 live births  \( \text{F} \)
- About 60\% represent nonheritable mutations  \( \text{T} \)
- To diagnose a case as ‘heritable,’ family history must be positive (but not necessarily a 1° relative)  \( \text{T} \)
- The exophytic type looks like Coats disease  \( \text{T} \)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  \( \text{F} \)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)  \( \text{T} \)
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease  \( \text{F} \)
- The Reese-Ellsworth classification system is the current preferred method for staging Rb  \( \text{F} \)

The Reese-Ellsworth classification system was the standard for many years. Why has it fallen out of favor?
The Reese-Ellsworth system was based on the assumption that the primary treatment modality was external-beam radiation therapy (XBRT). Now that XBRT is no longer the first-line treatment for most cases of Rb, the Reese-Ellsworth system is not as useful.

Did XBRT fall out of favor because it was ineffective?
No, it was quite effective--Rb is highly vulnerable to radiation therapy

If not a lack of efficacy, then why did XBRT fall from favor?
Because it significantly increases the risk of secondary malignancies later in life
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  

- About 60% represent nonheritable mutations  

- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1º relative)  

- The exophytic type looks like Coats disease  

- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  

- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)  

- Periodic MRI brain is warranted to detect early ‘trilateral’ disease  

- The Reese-Ellsworth classification system is the current preferred method for staging Rb

What classification system has replaced the outmoded Reese-Ellsworth system?

The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based?

The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR defined?
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  
- About 60% represent nonheritable mutations  
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative)  
- The exophytic type looks like Coats disease  
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)  
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease  
- The Reese-Ellsworth classification system is the current preferred method for staging Rb  

What classification system has replaced the outmoded Reese-Ellsworth system?

The International Classification for Intraocular Retinoblastoma (ICIR)
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  
- About 60% represent nonheritable mutations  
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative)  
- The exophytic type looks like Coats disease  
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)  
- Periodic MRI brain is warranted to detect early 'trilateral' disease  
- The Reese-Ellsworth classification system is the current preferred method for staging Rb

What classification system has replaced the outmoded Reese-Ellsworth system?

The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based?

- The International Classification for Intraocular Retinoblastoma (ICIR)

How are the five groups in the ICIR defined?

- The International Classification for Intraocular Retinoblastoma (ICIR)
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  
- About 60% represent nonheritable mutations  
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative)  
- The exophytic type looks like Coats disease  
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)  
- Periodic MRI brain is warranted to detect early 'trilateral' disease  
- The Reese-Ellsworth classification system is the current preferred method for staging Rb

What classification system has replaced the outmoded Reese-Ellsworth system?
The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based?
The probability that the eye can be saved with systemic chemotherapy

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based?
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- The Reese-Ellsworth classification system is the current preferred method for staging Rb

What classification system has replaced the outmoded Reese-Ellsworth system? The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based? The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR defined?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Risk of losing the eye if tx'd with chemo only</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>(Start here)</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- The Reese-Ellsworth classification system is the current preferred method for staging Rb

What classification system has replaced the outmoded Reese-Ellsworth system?
The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based?
The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR defined?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Risk of losing the eye if tx'd with chemo only</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- The Reese-Ellsworth classification system is the current preferred method for staging Rb

What classification system has replaced the outmoded Reese-Ellsworth system? The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based? The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR defined?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Risk of losing the eye if tx’d with chemo only</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>How low/high?</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- The Reese-Ellsworth classification system is the current preferred method for staging Rb

What classification system has replaced the outmoded Reese-Ellsworth system? The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based? The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR defined?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Risk of losing the eye if tx’d with chemo only</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong></td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Very low</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Concerning Rb, which of the following are true?**

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as ‘heritable,’ family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease
- The Reese-Ellsworth classification system is the current preferred method for staging Rb

**What classification system has replaced the outmoded Reese-Ellsworth system?**

The International Classification for Intraocular Retinoblastoma (ICIR)

**The Reese-Ellsworth system was built around XBRT; on what is the ICIR based?**

The probability that the eye can be saved with systemic chemotherapy

**How are the five groups in the ICIR defined?**

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Risk of losing the eye if tx’d with chemo only</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Very low</td>
</tr>
<tr>
<td>B</td>
<td><em>(Next)</em></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births (T)
- About 60% represent nonheritable mutations (T)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative) (F)
- The exophytic type looks like Coats disease (T)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated (F)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) (T)
- Periodic MRI brain is warranted to detect early 'trilateral' disease (F)
- The Reese-Ellsworth classification system is the current preferred method for staging Rb (F)

What classification system has replaced the outmoded Reese-Ellsworth system? The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based? The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR defined?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Risk of losing the eye if tx’d with chemo only</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Very low</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- The Reese-Ellsworth classification system is the current preferred method for staging Rb

What classification system has replaced the outmoded Reese-Ellsworth system?
The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based?
The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR defined?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Risk of losing the eye if tx’d with chemo only</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Very low</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td>How low/high?</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- The Reese-Ellsworth classification system is the current preferred method for staging Rb

What classification system has replaced the outmoded Reese-Ellsworth system? The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based? The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR defined?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Risk of losing the eye if tx’d with chemo only</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Very low</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td>Low</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- The Reese-Ellsworth classification system is the current preferred method for staging Rb

What classification system has replaced the outmoded Reese-Ellsworth system? The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based? The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR defined?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Risk of losing the eye if tx’d with chemo only</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Very low</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td>Low</td>
</tr>
<tr>
<td>C</td>
<td>(Next)</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as ‘heritable,’ family history must be positive (but not necessarily a 1st relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease
- The Reese-Ellsworth classification system is the current preferred method for staging Rb

What classification system has replaced the outmoded Reese-Ellsworth system?
The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based?
The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR defined?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Risk of losing the eye if tx’d with chemo only</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Very low</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td>Low</td>
</tr>
<tr>
<td>C</td>
<td>Local extraretinal spread (ie, subretinal fluid and/or vitreous seeding)</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births (T)
- About 60% represent nonheritable mutations (F)
- To diagnose a case as 'heritable,' family history must be positive (T)
- The exophytic type looks like Coats disease (T)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated (F)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) (T)
- Periodic MRI brain is warranted to detect early 'trilateral' disease (F)
- The Reese-Ellsworth classification system is the current preferred method for staging Rb (F)

What classification system has replaced the outmoded Reese-Ellsworth system? The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based? The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR defined?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Risk of losing the eye if tx’d with chemo only</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Very low</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td>Low</td>
</tr>
<tr>
<td>C</td>
<td>Local extraretinal spread (ie, subretinal fluid and/or vitreous seeding)</td>
<td>How low/high?</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- The Reese-Ellsworth classification system is the current preferred method for staging Rb

What classification system has replaced the outmoded Reese-Ellsworth system?
The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based?
The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR defined?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Risk of losing the eye if tx’d with chemo only</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Very low</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td>Low</td>
</tr>
<tr>
<td>C</td>
<td>Local extraretinal spread (ie, subretinal fluid and/or vitreous seeding)</td>
<td>Moderate</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**What classification system has replaced the outmoded Reese-Ellsworth system?**
The International Classification for Intraocular Retinoblastoma (ICIR)

**The Reese-Ellsworth system was built around XBRT; on what is the ICIR based?**
The probability that the eye can be saved with systemic chemotherapy

**How are the five groups in the ICIR defined?**

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Risk of losing the eye if tx’d with chemo only</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Very low</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td>Low</td>
</tr>
<tr>
<td>C</td>
<td>Local extraretinal spread (ie, subretinal fluid and/or vitreous seeding)</td>
<td>Moderate</td>
</tr>
<tr>
<td>D</td>
<td>(Next)</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- The Reese-Ellsworth classification system is the current preferred method for staging Rb

What classification system has replaced the outmoded Reese-Ellsworth system?
The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based?
The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR defined?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Risk of losing the eye if tx’d with chemo only</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Very low</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td>Low</td>
</tr>
<tr>
<td>C</td>
<td>Local extraretinal spread (ie, subretinal fluid and/or vitreous seeding)</td>
<td>Moderate</td>
</tr>
<tr>
<td>D</td>
<td>Extensive extraretinal spread</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as ‘heritable,’ family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease
- The Reese-Ellsworth classification system is the current preferred method for staging Rb

What classification system has replaced the outmoded Reese-Ellsworth system? The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based?

The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR defined?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Risk of losing the eye if tx’d with chemo only</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Very low</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td>Low</td>
</tr>
<tr>
<td>C</td>
<td>Local extraretinal spread (ie, subretinal fluid and/or vitreous seeding)</td>
<td>Moderate</td>
</tr>
<tr>
<td>D</td>
<td>Extensive extraretinal spread</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Concerning Rb, which of the following are true?

1. The incidence is roughly 1/100,000 live births
2. About 60% represent nonheritable mutations
3. To diagnose a case as ‘heritable,’ family history must be positive (but not necessarily a 1o relative)
4. The exophytic type looks like Coats disease
5. Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
6. CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
7. Periodic MRI brain is warranted to detect early ‘trilateral’ disease
8. The Reese-Ellsworth classification system is the current preferred method for staging Rb

What classification system has replaced the outmoded Reese-Ellsworth system?

The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based?

The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR defined?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Risk of losing the eye if tx’d with chemo only</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Very low</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td>Low</td>
</tr>
<tr>
<td>C</td>
<td>Local extraretinal spread (ie, subretinal fluid and/or vitreous seeding)</td>
<td>Moderate</td>
</tr>
<tr>
<td>D</td>
<td>Extensive extraretinal spread</td>
<td>High</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What classification system has replaced the outmoded Reese-Ellsworth system? The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based? The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR defined?
**What classification system has replaced the outmoded Reese-Ellsworth system?**
The International Classification for Intraocular Retinoblastoma (ICIR)

**The Reese-Ellsworth system was built around XBRT; on what is the ICIR based?**
The probability that the eye can be saved with systemic chemotherapy

**How are the five groups in the ICIR defined?**

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Risk of losing the eye if tx’d with chemo only</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Very low</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td>Low</td>
</tr>
<tr>
<td>C</td>
<td>Local extraretinal spread (ie, subretinal fluid and/or vitreous seeding)</td>
<td>Moderate</td>
</tr>
<tr>
<td>D</td>
<td>Extensive extraretinal spread</td>
<td>High</td>
</tr>
<tr>
<td>E</td>
<td>(Next)</td>
<td></td>
</tr>
</tbody>
</table>
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as ‘heritable,’ family history must be positive (but not necessarily a 1st relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease
- The Reese-Ellsworth classification system is the current preferred method for staging Rb

What classification system has replaced the outmoded Reese-Ellsworth system?  The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based?
The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR defined?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Risk of losing the eye if tx’d with chemo only</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Very low</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td>Low</td>
</tr>
<tr>
<td>C</td>
<td>Local extraretinal spread (ie, subretinal fluid and/or vitreous seeding)</td>
<td>Moderate</td>
</tr>
<tr>
<td>D</td>
<td>Extensive extraretinal spread</td>
<td>High</td>
</tr>
<tr>
<td>E</td>
<td>Profoundly compromised eye (eg, NVG, tumor-lens touch, vitreous hemorrhage, aseptic orbital cellulitis secondary to tumor necrosis, etc)</td>
<td></td>
</tr>
</tbody>
</table>

The International Classification for Intraocular Retinoblastoma (ICIR)
What classification system has replaced the outmoded Reese-Ellsworth system?
The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based?
The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR defined?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Risk of losing the eye if tx’d with chemo only</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Very low</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td>Low</td>
</tr>
<tr>
<td>C</td>
<td>Local extraretinal spread (ie, subretinal fluid and/or vitreous seeding)</td>
<td>Moderate</td>
</tr>
<tr>
<td>D</td>
<td>Extensive extraretinal spread</td>
<td>High</td>
</tr>
<tr>
<td>E</td>
<td>Profoundly compromised eye (eg, NVG, tumor-lens touch, vitreous hemorrhage, aseptic orbital cellulitis secondary to tumor necrosis, etc)</td>
<td>How low/high?</td>
</tr>
</tbody>
</table>
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- The Reese-Ellsworth classification system is the current preferred method for staging Rb

What classification system has replaced the outmoded Reese-Ellsworth system? The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based? The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR defined?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Risk of losing the eye if tx’d with chemo only</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Very low</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td>Low</td>
</tr>
<tr>
<td>C</td>
<td>Local extraretinal spread (ie, subretinal fluid and/or vitreous seeding)</td>
<td>Moderate</td>
</tr>
<tr>
<td>D</td>
<td>Extensive extraretinal spread</td>
<td>High</td>
</tr>
<tr>
<td>E</td>
<td>Profoundly compromised eye (eg, NVG, tumor-lens touch, vitreous hemorrhage, aseptic orbital cellulitis secondary to tumor necrosis, etc)</td>
<td>Very high</td>
</tr>
</tbody>
</table>
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- The Reese-Ellsworth classification system is the current preferred method for staging Rb

What classification system has replaced the outmoded Reese-Ellsworth system? The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based? The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR treated?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Preferred Treatment (in unilateral Rb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>?</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Local extraretinal spread (ie, subretinal fluid and/or vitreous seeding)</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Extensive extraretinal spread</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Profoundly compromised eye (eg, NVG, tumor-lens touch, vitreous hemorrhage, aseptic orbital cellulitis secondary to tumor necrosis, etc)</td>
<td></td>
</tr>
</tbody>
</table>
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- The Reese-Ellsworth classification system is the current preferred method for staging Rb

What classification system has replaced the outmoded Reese-Ellsworth system? The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based? The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR treated?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Preferred Treatment (in unilateral Rb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Laser</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td>(Chemoreduction is usually not needed for these small, discrete tumors)</td>
</tr>
<tr>
<td>C</td>
<td>Local extraretinal spread (ie, subretinal and/or vitreous seeding)</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Extensive extraretinal spread</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Profoundly compromised eye (eg, NVG, tumor-lens touch, vitreous hemorrhage, aseptic orbital cellulitis secondary to tumor necrosis, etc)</td>
<td></td>
</tr>
</tbody>
</table>
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births (T)
- About 60% represent nonheritable mutations (T)
- To diagnose a case as 'heritable,' family history must be positive (F)
- The exophytic type looks like Coats disease (T)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated (F)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) (T)
- Periodic MRI brain is warranted to detect early 'trilateral' disease (F)
- The Reese-Ellsworth classification system is the current preferred method for staging Rb (F)

What classification system has replaced the outmoded Reese-Ellsworth system? The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based? The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR treated?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Preferred Treatment (in unilateral Rb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Laser</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td>?</td>
</tr>
<tr>
<td>C</td>
<td>Local extraretinal spread (ie, subretinal fluid and/or vitreous seeding)</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Extensive extraretinal spread</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Profoundly compromised eye (eg, NVG, tumor-lens touch, vitreous hemorrhage, aseptic orbital cellulitis secondary to tumor necrosis, etc)</td>
<td></td>
</tr>
</tbody>
</table>
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- The Reese-Ellsworth classification system is the current preferred method for staging Rb

What classification system has replaced the outmoded Reese-Ellsworth system? The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based? The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR treated?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Preferred Treatment (in unilateral Rb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Laser</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td>Chemo + laser; Plaque therapy</td>
</tr>
<tr>
<td>C</td>
<td>Local extraretinal spread (ie, subretinal fluid and/or vitreous seeding)</td>
<td>?</td>
</tr>
<tr>
<td>D</td>
<td>Extensive extraretinal spread</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Profoundly compromised eye (eg, NVG, tumor-lens touch, vitreous hemorrhage, aseptic orbital cellulitis secondary to tumor necrosis, etc)</td>
<td></td>
</tr>
</tbody>
</table>

A classification system that has replaced the outmoded Reese-Ellsworth system is the International Classification for Intraocular Retinoblastoma (ICIR). The Reese-Ellsworth system was built around the probability that the eye can be saved with systemic chemotherapy. The ICIR is based on the probability that the eye can be saved with systemic chemotherapy. How are the five groups in the ICIR treated?
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- The Reese-Ellsworth classification system is the current preferred method for staging Rb

What classification system has replaced the outmoded Reese-Ellsworth system?
The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based?
The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR treated?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Preferred Treatment (in unilateral Rb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Laser</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td>Chemo + laser; Plaque therapy</td>
</tr>
<tr>
<td>C</td>
<td>Local extraretinal spread (ie, subretinal fluid and/or vitreous seeding)</td>
<td>Heavy chemo</td>
</tr>
<tr>
<td>D</td>
<td>Extensive extraretinal spread</td>
<td>?</td>
</tr>
<tr>
<td>E</td>
<td>Profoundly compromised eye (eg, NVG, tumor-lens touch, vitreous hemorrhage, aseptic orbital cellulitis secondary to tumor necrosis, etc)</td>
<td></td>
</tr>
</tbody>
</table>

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based? The probability that the eye can be saved with systemic chemotherapy

The International Classification for Intraocular Retinoblastoma (ICIR)

How are the five groups in the ICIR treated?
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early 'trilateral' disease
- The Reese-Ellsworth classification system is the current preferred method for staging Rb

What classification system has replaced the outmoded Reese-Ellsworth system? The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based? The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR treated?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Preferred Treatment (in unilateral Rb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Laser</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td>Chemo + laser; Plaque therapy</td>
</tr>
<tr>
<td>C</td>
<td>Local extraretinal spread (ie, subretinal fluid and/or vitreous seeding)</td>
<td>Heavy chemo</td>
</tr>
<tr>
<td>D</td>
<td>Extensive extraretinal spread</td>
<td>Probably enucleate</td>
</tr>
<tr>
<td>E</td>
<td>Profoundly compromised eye (eg, NVG, tumor-lens touch, vitreous hemorrhage, aseptic orbital cellulitis secondary to tumor necrosis, etc)</td>
<td>?</td>
</tr>
</tbody>
</table>
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as ‘heritable,’ family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease
- The Reese-Ellsworth classification system is the current preferred method for staging Rb

What classification system has replaced the outmoded Reese-Ellsworth system? The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based? The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR treated?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Preferred Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Laser</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td>Chemo + laser; Plaque therapy</td>
</tr>
<tr>
<td>C</td>
<td>Local extraretinal spread (ie, subretinal fluid and/or vitreous seeding)</td>
<td>Heavy chemo</td>
</tr>
<tr>
<td>D</td>
<td>Extensive extraretinal spread</td>
<td>Probably enucleate</td>
</tr>
<tr>
<td>E</td>
<td>Profoundly compromised eye (eg, NVG, tumor-lens touch, vitreous hemorrhage, aseptic orbital cellulitis secondary to tumor necrosis, etc)</td>
<td>Definitely enucleate</td>
</tr>
</tbody>
</table>
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
  - T
- About 60% represent nonheritable mutations
  - F
- To diagnose a case as ‘heritable,’ family history must be positive (but not necessarily a 1st relative)
  - F
- The exophytic type looks like Coats disease
  - T
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
  - F
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
  - T
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease
  - F
- The Reese-Ellsworth classification system is the current preferred method for staging Rb
  - F

What classification system has replaced the outmoded Reese-Ellsworth system?
The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based?
The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR treated?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Preferred Treatment (in unilateral Rb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Laser</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td>Chemo + laser; Plaque therapy</td>
</tr>
<tr>
<td></td>
<td><strong>Unilateral Rb management in a nutshell--if you remember nothing else, just remember this:</strong></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Local extraretinal spread (ie, subretinal fluid and/or vitreous seeding)</td>
<td>Heavy chemo</td>
</tr>
<tr>
<td>D</td>
<td>Extensive extraretinal spread</td>
<td>Probably enucleate</td>
</tr>
<tr>
<td>E</td>
<td>Profoundly compromised eye (eg, NVG, tumor-lens touch, vitreous hemorrhage, aseptic orbital cellulitis secondary to tumor necrosis, etc)</td>
<td>Definitely enucleate</td>
</tr>
</tbody>
</table>
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  
  *Answer: T*

- About 60% represent nonheritable mutations  
  *Answer: T*

- To diagnose a case as 'heritable,' family history must be positive  
  *Answer: F (but not necessarily a 1o relative)*

- The exophytic type looks like Coats disease  
  *Answer: T*

- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  
  *Answer: F*

- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)  
  *Answer: T*

- Periodic MRI brain is warranted to detect early 'trilateral' disease  
  *Answer: F*

- The Reese-Ellsworth classification system is the current preferred method for staging Rb  
  *Answer: F*

---

**What classification system has replaced the outmoded Reese-Ellsworth system?**

The International Classification for Intraocular Retinoblastoma (ICIR)

**The Reese-Ellsworth system was built around XBRT; on what is the ICIR based?**

The probability that the eye can be saved with systemic chemotherapy

**How are the five groups in the ICIR treated?**

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Preferred Treatment (in unilateral Rb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Laser</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td>Chemo + laser; Plaque therapy</td>
</tr>
</tbody>
</table>
|       | *Unilateral Rb management in a nutshell--if you remember nothing else, just remember this:*
|       | For relatively localized tumors: ‘Chemoreduction with focal consolidation’  |                                        |
| E     | Profoundly compromised eye (e.g., NVG, tumor-lens touch, vitreous hemorrhage, aseptic orbital cellulitis secondary to tumor necrosis, etc) | Definitely enucleate                     |
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as ‘heritable,’ family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease
- The Reese-Ellsworth classification system is the current preferred method for staging Rb

What classification system has replaced the outmoded Reese-Ellsworth system? The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based? The probability that the eye can be saved with systemic chemotherapy

How are the five groups in the ICIR treated?

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Preferred Treatment (in unilateral Rb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>Laser</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td>Chemo + laser; Plaque therapy</td>
</tr>
<tr>
<td></td>
<td><strong>Unilateral Rb management in a nutshell--if you remember nothing else, just remember this:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>For relatively localized tumors: ‘Chemoreduction with focal consolidation’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>For advanced tumors: <strong>Enucleation</strong></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Local extraretinal spread (ie, subretinal fluid and/or vitreous seeding)</td>
<td>Heavy chemo</td>
</tr>
<tr>
<td>D</td>
<td>Extensive extraretinal spread</td>
<td>Probably enucleate</td>
</tr>
<tr>
<td>E</td>
<td>Profoundly compromised eye (eg, NVG, tumor-lens touch, vitreous hemorrhage, aseptic orbital cellulitis secondary to tumor necrosis, etc)</td>
<td>Definitely enucleate</td>
</tr>
</tbody>
</table>
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births
- About 60% represent nonheritable mutations
- To diagnose a case as ‘heritable,’ family history must be positive (but not necessarily a 1o relative)
- The exophytic type looks like Coats disease
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease
- The Reese-Ellsworth classification system is the current preferred method for staging Rb

What classification system has replaced the outmoded Reese-Ellsworth system? The International Classification for Intraocular Retinoblastoma (ICIR)

The Reese-Ellsworth system was built around XBRT; on what is the ICIR based? The probability that the eye can be saved with systemic chemotherapy

**How are the five groups in the ICIR treated?**

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Preferred Treatment (in bilateral Rb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tumor(s) confined to retina, small, and far from the foveola and ONH</td>
<td>?</td>
</tr>
<tr>
<td>B</td>
<td>Tumor(s) confined to retina; otherwise fail to qualify for Group A</td>
<td>?</td>
</tr>
<tr>
<td>C</td>
<td>In contrast, treatment decisions in <strong>bilateral Rb</strong> are considerably more complex, and well beyond the scope of this review.</td>
<td>?</td>
</tr>
<tr>
<td>D</td>
<td>Extensive extraretinal spread</td>
<td>?</td>
</tr>
<tr>
<td>E</td>
<td>Profoundly compromised eye (eg, NVG, tumor-lens touch, vitreous hemorrhage, aseptic orbital cellulitis secondary to tumor necrosis, etc)</td>
<td>?</td>
</tr>
</tbody>
</table>
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  \[\text{F}\]
- About 60% represent nonheritable mutations  \[\text{T}\]
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\textsuperscript{o} relative)  \[\text{F}\]
- The \textit{exophytic} type looks like Coats disease  \[\text{T}\]
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  \[\text{F}\]
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)  \[\text{F}\]
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease  \[\text{F}\]
- The Reese-Ellsworth classification system is the current preferred method for staging Rb  \[\text{F}\]
- Patients with Rb are more likely to die of a second malignancy than of Rb itself  \[\text{F}\]
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births: **F**
- About 60% represent nonheritable mutations: **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative): **F**
- The *exophytic* type looks like Coats disease: **T**
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated: **F**
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present): **F**
- Periodic MRI brain is warranted to detect early 'trilateral' disease: **F**
- The Reese-Ellsworth classification system is the current preferred method for staging Rb: **F**
- Patients with Rb are more likely to die of a second malignancy than of Rb itself: **T**
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  **F**
- About 60% represent nonheritable mutations  **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1st relative)  **F**
- The *exophytic* type looks like Coats disease  **T**
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  **F**
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)  **F**
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease  **F**
- The Reese-Ellsworth classification system is the current preferred method for staging Rb  **F**
- Patients with Rb are more likely to die of a second malignancy than of Rb itself  **T**
- The histologic hallmark is the Homer Wright rosette
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births **F**
- About 60% represent nonheritable mutations **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1st relative) **F**
- The exophytic type looks like Coats disease **T**
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated **F**
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) **F**
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease **F**
- The Reese-Ellsworth classification system is the current preferred method for staging Rb **F**
- Patients with Rb are more likely to die of a second malignancy than of Rb itself **T**
- The histologic hallmark is the Homer-Wright rosette **F**
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births. **F**
- About 60% represent nonheritable mutations. **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative). **F**
- The *exophytic* type looks like Coats disease. **T**
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated. **F**
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present). **F**
- Periodic MRI brain is warranted to detect early 'trilateral' disease. **F**
- The Reese-Ellsworth classification system is the current preferred method for staging Rb. **F**
- Patients with Rb are more likely to die of a second malignancy than of Rb itself. **T**

*With respect to Rb histology, the term ‘rosette’ is used in three contexts. What are they?*

- *Flexner-Wintersteiner rosettes*
- *Pseudorosettes*
- *Homer Wright rosettes*
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  \( \times \)
- About 60\% represent nonheritable mutations  \( \checkmark \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1st relative)  \( \times \)
- The exophytic type looks like Coats disease  \( \checkmark \)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  \( \times \)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)  \( \times \)
- Periodic MRI brain is warranted to detect early 'trilateral' disease  \( \times \)
- The Reese-Ellsworth classification system is the current preferred method for staging Rb  \( \checkmark \)
- Patients with Rb are more likely to die of a second malignancy than of Rb itself  \( \checkmark \)
- The histologic hallmark is the Homer Wright rosette  \( \times \)

With respect to Rb histology, the term ‘rosette’ is used in three contexts. What are they?

- Flexner-Wintersteiner rosettes  \( \checkmark \)
- Pseudorosettes  \( \checkmark \)
- Homer Wright rosettes  \( \times \)
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births **F**
- About 60% represent nonheritable mutations **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{st}\) relative) **F**
- The exophytic type looks like Coats disease **T**
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated **F**
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) **F**
- Periodic MRI brain is warranted to detect early 'trilateral' disease **F**
- The Reese-Ellsworth classification system is the current preferred method for staging Rb **F**
- Patients with Rb are more likely to die of a second malignancy than of Rb itself **T**
- The histologic hallmark is the Homer Wright rosette **F**

*With respect to Rb histology, the term ‘rosette’ is used in three contexts. What are they?*

-- Flexner-Wintersteiner rosettes
-- Pseudorosettes
-- Homer Wright rosettes

*Again with respect to Rb histology, another ‘-ette’ term is key. What is it?*

Flexner-Wintersteiner
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  \( \text{F} \)
- About 60% represent nonheritable mutations  \( \text{T} \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a first-degree relative)  \( \text{F} \)
- The exophytic type looks like Coats disease  \( \text{T} \)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  \( \text{F} \)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)  \( \text{F} \)
- Periodic MRI brain is warranted to detect early 'trilateral' disease  \( \text{F} \)
- The Reese-Ellsworth classification system is the current preferred method for staging Rb  \( \text{T} \)
- Patients with Rb are more likely to die of a second malignancy than of Rb itself  \( \text{T} \)
- The histologic hallmark is the Homer-Wright rosette  \( \text{F} \)

With respect to Rb histology, the term ‘rosette’ is used in three contexts. What are they?

- Flexner-Wintersteiner rosettes
- Pseudorosettes
- Homer Wright rosettes

Again with respect to Rb histology, another ‘-ette’ term is key. What is it?

‘Fleurette’
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births **F**
- About 60% represent nonheritable mutations **T**
- To diagnosis a case as 'heritable,' family history must be positive (but not necessarily a 1st relative) **F**
- The exophytic type looks like Coats disease **T**
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated **F**
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) **F**
- Periodic MRI brain is warranted to detect early 'trilateral' disease **F**
- The Reese-Ellsworth classification system is the current preferred method for staging Rb **F**
- Patients with Rb are more likely to die of a second malignancy than of Rb itself **T**
- The histologic hallmark is the Homer-Wright rosette **F**

What is the characteristic appearance of a Flexner-Wintersteiner rosette?

- Flexner-Wintersteiner rosettes
- Pseudorosettes
- Homer Wright rosettes

Again with respect to Rb histology, another 'ette' term is key. What is it?

- Fleurette

With respect to Rb histology, the term 'rosette' is used in three contexts. What are they?

- Flexner-Wintersteiner rosettes
- Pseudorosettes
- Homer Wright rosettes

In a nutshell, the formation of Flexner-Wintersteiner rosettes can be described as an attempt by tumor cells to do something. Do what?

- F-W rosettes represent an attempt at differentiation into retinal structures
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( \text{F} \)
- About 60% represent nonheritable mutations \( \text{T} \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative) \( \text{F} \)
- The exophytic type looks like Coats disease \( \text{T} \)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated \( \text{F} \)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) \( \text{F} \)
- Periodic MRI brain is warranted to detect early 'trilateral' disease \( \text{F} \)
- The Reese-Ellsworth classification system is the current preferred method for staging Rb \( \text{F} \)
- Patients with Rb are more likely to die of a second malignancy than of Rb itself \( \text{T} \)
- The histologic hallmark is the Homer-Wright rosette \( \text{F} \)

What is the characteristic appearance of a Flexner-Wintersteiner rosette? A number of retinoblasts organized in a circle around a lumen

With respect to Rb histology, the term 'rosette' is used in three contexts. What are they?

- Flexner-Wintersteiner rosettes
- Pseudorosettes
- Homer Wright rosettes

Again with respect to Rb histology, another 'ette' term is key. What is it?

- Fleurette

Flexner-Wintersteiner rosettes represent an attempt at differentiation into retinal structures
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births. **F**
- About 60% represent nonheritable mutations. **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1st relative). **F**
- Flexner-Wintersteiner rosettes look like Coats disease. **T**
- Tissue diagnosis is necessary if enucleation is being contemplated. **F**
- CT orbits have a role in purely intraocular Rb (i.e., even if no orbital extension is present). **F**
- Periodic MRI brain is warranted to detect early 'trilateral' disease. **F**
- The Reese-Ellsworth classification system is the current preferred method for staging Rb. **F**
- Patients with Rb are more likely to die of a second malignancy than of Rb itself. **T**
- The histologic hallmark is the Homer Wright rosette. **F**

**What is the characteristic appearance of a Flexner-Wintersteiner rosette?**

A number of retinoblasts organized in a circle around a lumen.

**Is the lumen empty?**

Yes, but it is lined by a structure often described as 'refractile.'

**With respect to Rb histology, the term 'rosette' is used in three contexts. What are they?**

- Flexner-Wintersteiner rosettes
- Pseudorosettes
- Homer Wright rosettes

**Again with respect to Rb histology, another ‘-ette’ term is key. What is it?**

‘Fleurette’

**Flexner-Wintersteiner Homer Wright**
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( F \)
- About 60\% represent nonheritable mutations \( T \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1st relative) \( F \)
- The exophytic type looks like Coats disease \( T \)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated \( F \)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) \( F \)
- Periodic MRI brain is warranted to detect early 'trilateral' disease \( F \)
- The Reese-Ellsworth classification system is the current preferred method for staging Rb \( F \)
- Patients with Rb are more likely to die of a second malignancy than of Rb itself \( T \)
- The histologic hallmark is the Homer Wright rosette \( F \)

What is the characteristic appearance of a Flexner-Wintersteiner rosette?
A number of retinoblasts organized in a circle around a lumen

Is the lumen empty?
Yes, but it is lined by a structure often described as

---

Flexner-Wintersteiner rosettes
Pseudorosettes
Homer Wright rosettes

Again with respect to Rb histology, another 'ette' term is key. What is it?

Fleurette
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births. \( F \)
- About 60% represent nonheritable mutations. \( T \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1st degree relative). \( T \)
- The exophytic type looks like Coats disease. \( T \)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated. \( F \)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present). \( F \)
- Periodic MRI brain is warranted to detect early 'trilateral' disease. \( F \)
- The Reese-Ellsworth classification system is the current preferred method for staging Rb. \( F \)
- Patients with Rb are more likely to die of a second malignancy than of Rb itself. \( T \)
- The histologic hallmark is the Homer-Wright rosette. \( F \)

What is the characteristic appearance of a Flexner-Wintersteiner rosette?
A number of retinoblasts organized in a circle around a lumen.

Is the lumen empty?
Yes, but it is lined by a structure often described as 'refractile.'

With respect to Rb histology, the term 'rosette' is used in three contexts. What are they?
- Flexner-Wintersteiner rosettes
- Pseudorosettes
- Homer Wright rosettes

Again with respect to Rb histology, another '-ette' term is key. What is it?
‘Fleurette’

Flexner-Wintersteiner rosettes represent an attempt at differentiation into retinal structures.
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births. **F**
- About 60% represent nonheritable mutations. **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative). **F**
- The exophytic type looks like Coats disease. **T**
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated. **F**
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present). **F**
- Periodic MRI brain is warranted to detect early 'trilateral' disease. **F**
- The Reese-Ellsworth classification system is the current preferred method for staging Rb. **F**
- Patients with Rb are more likely to die of a second malignancy than of Rb itself. **T**
- The histologic hallmark is the Homer-Wright rosette. **F**

What is the characteristic appearance of a Flexner-Wintersteiner rosette? A number of retinoblasts organized in a circle around a lumen. **F**

Is the lumen empty? Yes, but it is lined by a structure often described as ‘refractile.’ **F**

What normal retinal structure correlates with this refractile lining? The retinal outer membrane. **F**

Flexner-Wintersteiner rosettes, Pseudorosettes, Homer-Wright rosettes. **F**

Again with respect to Rb histology, another ‘-ette’ term is key. What is it? Fleurette. **F**
Concerning Rb, which of the following are true?

- The incidence is roughly 1/400,000 live births \( F \)
- About 60% represent nonheritable mutations \( T \)
- To diagnosis a case as 'heritable,' family history must be positive (but not necessarily a 1o relative) \( F \)
- The exophytic type looks like Coats disease \( T \)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated \( F \)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) \( F \)
- Periodic MRI brain is warranted to detect early 'trilateral' disease \( F \)
- The Reese-Ellsworth classification system is the current preferred method for staging Rb \( F \)
- Patients with Rb are more likely to die of a second malignancy than of Rb itself \( T \)
- The histologic hallmark is the Homer-Wright rosette \( F \)

---

What is the characteristic appearance of a Flexner-Wintersteiner rosette? A number of retinoblasts organized in a circle around a lumen

Is the lumen empty? Yes, but it is lined by a structure often described as ‘refractile’

What normal retinal structure correlates with this refractile lining? The retinal outer membrane

With respect to Rb histology, another ‘-ette’ term is key. What is it? ‘Fleurette’

---

Flexner-Wintersteiner rosettes

Pseudorosettes

Homer Wright rosettes
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( F \)
- About 60% represent nonheritable mutations \( T \)
- To diagnose a case as ‘heritable,’ family history must be positive (but not necessarily a 1o relative) \( F \)
- The \text{exophytic} type looks like Coats disease \( T \)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated \( F \)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) \( F \)
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease \( F \)
- The Reese-Ellsworth classification system is the current preferred method for staging Rb \( F \)
- Patients with Rb are more likely to die of a second malignancy than of Rb itself \( T \)
- The histologic hallmark is the Homer-Wright rosette \( F \)

\begin{itemize}
  \item What is the characteristic appearance of a Flexner-Wintersteiner rosette?
    
    A number of retinoblasts organized in a circle around a lumen
  \item Is the lumen empty?
    
    Yes, but it is lined by a structure often described as ‘refractile’
  \item Is the Flexner-Wintersteiner rosette pathognomonic for Rb?
    
    No, but it is commonly present in Rb, and quite rare in other tumors
  \item With respect to Rb histology, the term ‘rosette’ is used in three contexts. What are they?
    
    -- Flexner-Wintersteiner rosettes
    -- Pseudorosettes
    -- Homer Wright rosettes
  \item Again with respect to Rb histology, another ‘-ette’ term is key. What is it?
    
    ‘Fleurette’
\end{itemize}
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births F
- About 60% represent nonheritable mutations T
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative) F
- The exophytic type looks like Coats disease T
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated F
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) F
- Periodic MRI brain is warranted to detect early 'trilateral' disease F
- The Reese-Ellsworth classification system is the current preferred method for staging Rb F
- Patients with Rb are more likely to die of a second malignancy than of Rb itself T
- The histologic hallmark is the Homer-Wright rosette F

What is the characteristic appearance of a Flexner-Wintersteiner rosette? A number of retinoblasts organized in a circle around a lumen

Is the lumen empty? Yes, but it is lined by a structure often described as ‘refractile’

Is the Flexner-Wintersteiner rosette pathognomonic for Rb? No, but it is commonly present in Rb, and quite rare in other tumors

With respect to Rb histology, another ‘-ette’ term is key. What are they?--Flexner-Wintersteiner rosettes
--Pseudorosettes
--Homer Wright rosettes

Again with respect to Rb histology, another ‘-ette’ term is key. What is it? ‘Fleurette’
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births **F**
- About 60% represent nonheritable mutations **T**
- To diagnose a case as ‘heritable,’ family history must be positive (but not necessarily a 1o relative) **T**
- The exophytic type looks like Coats disease **T**
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated **F**
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) **F**
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease **F**
- The Reese-Ellsworth classification system is the current preferred method for staging Rb **F**
- Patients with Rb are more likely to die of a second malignancy than of Rb itself **T**
- The histologic hallmark is the Homer-Wright rosette **F**

What is the characteristic appearance of a Flexner-Wintersteiner rosette?
A number of retinoblasts organized in a circle around a lumen

**Is the lumen empty?**
Yes, but it is lined by a structure often described as ‘refractile’

**Is the Flexner-Wintersteiner rosette pathognomonic for Rb?**
No, but it is commonly present in Rb, and quite rare in other tumors

In a nutshell, the formation of Flexner-Wintersteiner rosettes can be described as an attempt by tumor cells to do something. Do what?

With respect to Rb histology, the term ‘rosette’ is used in three contexts. What are they?

-- Flexner-Wintersteiner rosettes
-- Pseudorosettes
-- Homer Wright rosettes

Again with respect to Rb histology, another ‘-ette’ term is key. What is it?

‘Fleurette’
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( F \)
- About 60% represent nonheritable mutations \( T \)
- To diagnose a case as ‘heritable,’ family history must be positive \( F \)
- The exophytic type looks like Coats disease \( T \)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated \( F \)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) \( F \)
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease \( F \)
- The Reese-Ellsworth classification system is the current preferred method for staging Rb \( F \)
- Patients with Rb are more likely to die of a second malignancy than of Rb itself \( T \)
- The histologic hallmark is the Homer Wright rosette \( F \)

---

**What is the characteristic appearance of a Flexner-Wintersteiner rosette?**

A number of retinoblasts organized in a circle around a lumen

**Is the lumen empty?**

Yes, but it is lined by a structure often described as ‘refractile’

**Is the Flexner-Wintersteiner rosette pathognomonic for Rb?**

No, but it is commonly present in Rb, and quite rare in other tumors

**In a nutshell, the formation of Flexner-Wintersteiner rosettes can be described as an attempt by tumor cells to do something. Do what?**

They represent an attempt at differentiation into retinal structures

---

**Flexner-Wintersteiner rosettes**

- Pseudorosettes
- Homer Wright rosettes

Again with respect to Rb histology, another ‘-ette’ term is key. What is it?

‘Fleurette’

---

**With respect to Rb histology, the term ‘rosette’ is used in three contexts. What are they?**

- Flexner-Wintersteiner rosettes
- Pseudorosettes
- Homer Wright rosettes

---

**The histologic hallmark is the Homer Wright rosette**

---
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  
  - F
- About 60% represent nonheritable mutations  
  - T
- To diagnose a case as 'heritable,' family history must be positive  
  (but not necessarily a 1° relative).  
  - F
- The exophytic type looks like Coats disease  
  - T
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap  
  must be obtained if enucleation is being contemplated  
  - F
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital  
  extension is present)  
  - F
- Periodic MRI brain is warranted to detect early 'trilateral' disease  
  - F
- The Reese-Ellsworth classification system is the current preferred  
  method for staging Rb  
  - F
- Patients with Rb are more likely to die of a second malignancy than  
  of Rb itself  
  - T
- The histologic hallmark is the Homer-Wright rosette  
  - F

What are pseudorosettes?

With respect to Rb histology, the term ‘rosette’ is used in three contexts. What are they?

- Flexner-Wintersteiner rosettes  
  - F
- Pseudorosettes  
  - F
- Homer Wright rosettes  
  - F

Again with respect to Rb histology, another ‘-ette’ term is key. What is it?

- Fleurette
Concerning Rb, which of the following are true?

- The incidence is roughly 1/400,000 live births **F**
- About 60% represent nonheritable mutations **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1st relative) **F**
- The exophytic type looks like Coats disease **T**
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated **F**
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) **F**
- Periodic MRI brain is warranted to detect early 'trilateral' disease **F**
- The Reese-Ellsworth classification system is the current preferred method for staging Rb **F**
- Patients with Rb are more likely to die of a second malignancy than of Rb itself **T**
- The histologic hallmark is the Homer Wright rosette **F**

What are pseudorosettes?
A description of the histologic appearance of the tumor with respect to how it organizes around blood vessels

With respect to Rb histology, the term 'rosette' is used in three contexts. What are they?

- Flexner-Wintersteiner rosettes
- Pseudorosettes
- Homer Wright rosettes

Again with respect to Rb histology, another ‘-ette’ term is key. What is it?

- Fleurette

Flexner-Wintersteiner rosettes
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( \text{T} \)
- About 60% represent nonheritable mutations \( \text{F} \)
- To diagnose a case as 'heritable,' family history must be positive (but need not be positive in a 1° relative) \( \text{F} \)
- The exophytic type looks like Coats disease \( \text{T} \)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated \( \text{F} \)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) \( \text{F} \)
- Periodic MRI brain is warranted to detect early 'trilateral' disease \( \text{F} \)
- The Reese-Ellsworth classification system is the current preferred method for staging Rb \( \text{F} \)
- Patients with Rb are more likely to die of a second malignancy than of Rb itself \( \text{T} \)
- The histologic hallmark is the Homer-Wright rosette \( \text{F} \)

**What are pseudorosettes?**
A description of the histologic appearance of the tumor with respect to how it organizes around blood vessels

**How does the tumor tend to organize with respect to blood vessels?**

With respect to Rb histology, the term 'rosette' is used in three contexts: What are they?

- Flexner-Wintersteiner rosettes
- **Pseudorosettes**
- Homer Wright rosettes

Again with respect to Rb histology, another 'ette' term is key. What is it?

- ‘Fleurette’

Flexner-Wintersteiner
Homer-Wright
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  \( \text{F} \)
- About 60% represent nonheritable mutations  \( \text{T} \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1o relative)  \( \text{F} \)
- The exophytic type looks like Coats disease  \( \text{T} \)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  \( \text{F} \)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)  \( \text{F} \)
- Periodic MRI brain is warranted to detect early 'trilateral' disease  \( \text{F} \)
- The Reese-Ellsworth classification system is the current preferred method for staging Rb  \( \text{F} \)
- Patients with Rb are more likely to die of a second malignancy than of Rb itself  \( \text{T} \)
- The histologic hallmark is the Homer Wright rosette  \( \text{F} \)

What are pseudorosettes?

A description of the histologic appearance of the tumor with respect to how it organizes around blood vessels

How does the tumor tend to organize with respect to blood vessels?

Like other fast-growing tumors, Rb has a tendency to ‘outgrow’ its blood supply. That is, tumor cells frequently end up so far from a blood vessel that they are unable to have their metabolic needs met. Cells in these areas die, and subsequently necrose. Thus, at low mag, an Rb tumor will be characterized by cuffs of living cells surrounding blood vessels, with the cuffs in turn being surrounded by areas of necrosis. A pseudorosette is the blood vessel along with its cuff of viable cells.

With respect to Rb histology, the term ‘rosette’ is used in three contexts. What are they?

- Flexner-Wintersteiner rosettes
  --Pseudorosettes
- Homer Wright rosettes

Again with respect to Rb histology, another ‘-ette’ term is key. What is it?

- Fleurette
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births legates
- About 60% represent nonheritable mutations  
- To diagnose a case as 'heritable,' family history must be positive  
- The exophytic type looks like Coats disease  
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)  
- Periodic MRI brain is warranted to detect early 'trilateral' disease  
- The Reese-Ellsworth classification system is the current preferred method for staging Rb  
- Patients with Rb are more likely to die of a second malignancy than of Rb itself  
- The histologic hallmark is the Homer Wright rosette

The areas of necrosis are characterized by the presence of a substance of some import. What is it? 

Calcium

A description of the histologic appearance of the tumor with respect to how it organizes around blood vessels. How does the tumor tend to organize with respect to blood vessels? 

Like other fast-growing tumors, Rb has a tendency to 'outgrow' its blood supply. That is, tumor cells frequently end up so far from a blood vessel that they are unable to have their metabolic needs met. Cells in these areas die, and subsequently necrose. Thus, at low mag, an Rb tumor will be characterized by cuffs of living cells surrounding blood vessels, with the cuffs in turn being surrounded by areas of necrosis. A pseudorosette is the blood vessel along with its cuff of viable cells.

With respect to Rb histology, the term 'rosette' is used in three contexts. What are they? 

--Flexner-Wintersteiner rosettes  
--Pseudorosettes  
--Homer Wright rosettes

Again with respect to Rb histology, another ‘-ette’ term is key. What is it? 

‘Fleurette’
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \(\times\)  
  \(\text{False}\)

- About 60\% represent nonheritable mutations \(\checkmark\)

- To diagnose a case as 'heritable,' family history must be positive \(\checkmark\)

- The exophytic type looks like Coats disease \(\checkmark\)

- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap need not be obtained if enucleation is being contemplated \(\times\)

- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) \(\times\)

- Periodic MRI brain is warranted to detect early 'trilateral' disease \(\times\)

- The Reese-Ellsworth classification system is the current preferred method for staging Rb \(\checkmark\)

- Patients with Rb are more likely to die of a second malignancy than of Rb itself \(\checkmark\)

With respect to Rb histology, the term 'rosette' is used in three contexts. What are they?

- Flexner-Wintersteiner rosettes
- Pseudorosettes
- Homer Wright rosettes

Again with respect to Rb histology, another 'ette' term is key. What is it?

- Fleurette

The histologic hallmark is the Homer Wright rosette \(\times\)

The areas of necrosis are characterized by the presence of a substance of some import. What is it?

- Calcium
Concerning Rb, which of the following are true?

- The incidence is roughly 1/400,000 live births **F**
- About 60% represent nonheritable mutations **T**
- To diagnose a case as 'heritable,' family history must be positive **F**
- The exophytic type looks like Coats disease **T**
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated **F**
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) **F**
- Periodic MRI brain is warranted to detect early ‘trilateral’ disease **F**
- The Reese-Ellsworth classification system is the current preferred method for staging Rb **F**
- Patients with Rb are more likely to die of a second malignancy than of Rb itself **T**
- The histologic hallmark is the Homer Wright rosette **F**

*The areas of necrosis are characterized by the presence of a substance of some import. What is it? Calcium*

*Why is the presence of calcium within areas of necrosis important?*

With respect to Rb histology, the term 'rosette' is used in three contexts. What are they?

- Flexner-Wintersteiner rosettes
- Pseudorosettes
- Homer Wright rosettes

*Again with respect to Rb histology, another 'ette' term is key. What is it? Fleurette*
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \(\text{F}\)
- About 60% represent nonheritable mutations \(\text{T}\)
- To diagnose a case as 'heritable,' family history must be positive \(\text{F}\)
- The exophytic type looks like Coats disease \(\text{T}\)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated \(\text{F}\)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) \(\text{F}\)
- Periodic MRI brain is warranted to detect early 'trilateral' disease \(\text{F}\)
- The Reese-Ellsworth classification system is the current preferred method for staging Rb \(\text{F}\)
- Patients with Rb are more likely to die of a second malignancy than of Rb itself \(\text{T}\)
- The histologic hallmark is the Homer Wright rosette \(\text{F}\)

What? A description of the histologic appearance of the tumor with respect to how it organizes around blood vessels.

How does the tumor tend to organize with respect to blood vessels? Like other fast-growing tumors, Rb has a tendency to 'outgrow' its blood supply. That is, tumor cells frequently end up so far from a blood vessel that they are unable to have their metabolic needs met. Cells in these areas die, and subsequently necrose. Thus, at low mag, an Rb tumor will be characterized by cuffs of living cells surrounding blood vessels, with the cuffs in turn being surrounded by areas of necrosis. A pseudorosette is the blood vessel along with its cuff of viable cells.

Why is the presence of calcium within areas of necrosis important? It is this calcium that shows up on imaging, thus providing an important diagnostic clue that one is dealing with Rb.

The areas of necrosis are characterized by the presence of a substance of some import. What is it? Calcium

Again with respect to Rb histology, another '-ette' term is key. What is it? 'Fleurette'
Concerning Rb, which of the following are true?

- The incidence is roughly $1/100,000$ live births.  
  - F
- About $60\%$ represent nonheritable mutations.  
  - T
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative).  
  - F
- The exophytic type looks like Coats disease.  
  - T
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated.  
  - F
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present).  
  - F
- Periodic MRI brain is warranted to detect early 'trilateral' disease.  
  - F
- The Reese-Ellsworth classification system is the current preferred method for staging Rb.  
  - T
- Patients with Rb are more likely to die of a second malignancy than of Rb itself.  
  - T
- The histologic hallmark is the Homer Wright rosette.  
  - F

What is the characteristic appearance of a Homer Wright rosette?

- Like a Flexner-Wintersteiner rosette, it is composed of a number of retinoblasts organized in a circle around a lumen.
- The lumen contains an eosinophilic structure called a 'neurofibrillary tangle.'
- No, it is not pathognomonic for Rb as it is commonly present in other tumors.

Again with respect to Rb histology, another 'ette' term is key. What is it?

- Flexner-Wintersteiner
- Pseudorosettes
- Homer Wright rosettes

With respect to Rb histology, the term 'rosette' is used in three contexts. What are they?

- Flexner-Wintersteiner rosettes
- Pseudorosettes
- Homer Wright rosettes

Fleurerette
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births **F**
- About 60% represent nonheritable mutations **T** need not
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative) **F**
- The exophytic type looks like Coats disease **T**
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated **F**
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) **F**
- Periodic MRI brain is warranted to detect early 'trilateral' disease **F**
- The Reese-Ellsworth classification system is the current preferred method for staging Rb **F**
- Patients with Rb are more likely to die of a second malignancy than of Rb itself **T**
- The histologic hallmark is the Homer Wright rosette **F**

What is the characteristic appearance of a Homer Wright rosette? Like a Flexner-Wintersteiner rosette, it is composed of a number of retinoblasts organized in a circle around a lumen.

With respect to Rb histology, the term 'rosette' is used in three contexts. What are they?
- Flexner-Wintersteiner rosettes
- Pseudorosettes
- Homer Wright rosettes

Again with respect to Rb histology, another 'ette' term is key. What is it? 'Fleurette'

[Reference image and text]
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  \( \text{F} \)
- About 60% represent nonheritable mutations  \( \text{T} \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{st}\) relative)  \( \text{F} \)
- The exophytic type looks like Coats disease  \( \text{T} \)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  \( \text{F} \)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)  \( \text{F} \)
- Periodic MRI brain is warranted to detect early 'trilateral' disease  \( \text{F} \)
- The Reese-Ellsworth classification system is the current preferred method for staging Rb  \( \text{F} \)
- Patients with Rb are more likely to die of a second malignancy than of Rb itself  \( \text{T} \)
- The histologic hallmark is the Homer Wright rosette  \( \text{F} \)

---

**What is the characteristic appearance of a Homer Wright rosette?**

Like a Flexner-Wintersteiner rosette, it is composed of a number of retinoblasts organized in a circle around a lumen.

**Is the lumen empty?**

- No, it contains an eosinophilic structure called a 'neurofibrillary tangle'.

---

**With respect to Rb histology, the term 'rosette' is used in three contexts. What are they?**

- Flexner-Wintersteiner rosettes
- Pseudorosettes
- Homer Wright rosettes

---

**Again with respect to Rb histology, another ‘-ette’ term is key. What is it?**

- Fleurette

---

Flexner-Wintersteiner Homer-Wright
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births: **F**
- About 60% represent nonheritable mutations: **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1st relative): **F**
- The exophytic type looks like Coats disease: **T**
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated: **F**
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present): **F**
- Periodic MRI brain is warranted to detect early 'trilateral' disease: **F**
- The Reese-Ellsworth classification system is the current preferred method for staging Rb: **F**
- Patients with Rb are more likely to die of a second malignancy than of Rb itself: **T**
- The histologic hallmark is the Homer Wright rosette: **F**

**What is the characteristic appearance of a Homer Wright rosette?**
- Like a Flexner-Wintersteiner rosette, it is composed of a number of retinoblasts organized in a circle around a lumen.

**Is the lumen empty?**
- No, it contains an eosinophilic structure called a 'neurofibrillary tangle'.

With respect to Rb histology, the term 'rosette' is used in three contexts. What are they?
- Flexner-Wintersteiner rosettes
- Pseudorosettes
- Homer Wright rosettes

Again with respect to Rb histology, another '-ette' term is key. What is it?
- Fleurette
Concerning Rb, which of the following are true?

- The incidence is roughly 1/400,000 live births  \( F \)
- About 60% represent nonheritable mutations  \( T \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{st}\) relative)  \( F \)
- The exophytic type looks like Coats disease  \( T \)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  \( F \)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)  \( F \)
- Periodic MRI brain is warranted to detect early 'trilateral' disease  \( F \)
- The Reese-Ellsworth classification system is the current preferred method for staging Rb  \( F \)
- Patients with Rb are more likely to die of a second malignancy than of Rb itself  \( T \)
- The histologic hallmark is the Homer Wright rosette  \( F \)

What is the characteristic appearance of a Homer Wright rosette?
Like a Flexner-Wintersteiner rosette, it is composed of a number of retinoblasts organized in a circle around a lumen.

Is the lumen empty?
No, it contains an eosinophilic structure called a 'neurofibrillary tangle.'

With respect to Rb histology, the term 'rosette' is used in three contexts. What are they?
- Flexner-Wintersteiner rosettes
- Pseudorosettes
- Homer Wright rosettes

Again with respect to Rb histology, another '-ette' term is key. What is it?
'Fleurette'

Flexner-Wintersteiner Homer Wright
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births **F**
- About 60% represent nonheritable mutations **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1st relative) **F**
- The exophytic type looks like Coats disease **T**
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated **F**
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) **F**
- Periodic MRI brain is warranted to detect early 'trilateral' disease **F**
- The Reese-Ellsworth classification system is the current preferred method for staging Rb **F**
- Patients with Rb are more likely to die of a second malignancy than of Rb itself **T**
- The histologic hallmark is the Homer Wright rosette **F**

**What is the characteristic appearance of a Homer Wright rosette?**
Like a Flexner-Wintersteiner rosette, it is composed of a number of retinoblasts organized in a circle around a lumen.

**Is the lumen empty?**
No, it contains an eosinophilic structure called a ‘neurofibrillary tangle’.

**Is the Homer Wright rosette pathognomonic for Rb?**
No. It is not always encountered in Rb, and is commonly present in other tumors.

**With respect to Rb histology, the term ‘rosette’ is used in three contexts. What are they?**
- Flexner-Wintersteiner rosettes
- Pseudorosettes
- Homer Wright rosettes

**Again with respect to Rb histology, another ‘-ette’ term is key. What is it?**
‘Fleurette’

**Flexner-Wintersteiner rosettes**
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( \text{F} \)
- About 60% represent nonheritable mutations \( \text{T} \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{o}\) relative) \( \text{F} \)
- Exophytic type looks like Coats disease \( \text{T} \)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated \( \text{F} \)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) \( \text{F} \)
- Periodic MRI brain is warranted to detect early 'trilateral' disease \( \text{F} \)
- Reese-Ellsworth classification system is the current preferred method for staging Rb \( \text{F} \)
- Patients with Rb are more likely to die of a second malignancy than of Rb itself \( \text{T} \)
- The histologic hallmark is the Homer Wright rosette \( \text{F} \)

What is the characteristic appearance of a Homer Wright rosette?
Like a Flexner-Wintersteiner rosette, it is composed of a number of retinoblasts organized in a circle around a lumen

Is the lumen empty?
No, it contains an eosinophilic structure called a ‘neurofibrillary tangle’

Is the Homer Wright rosette pathognomonic for Rb?
No. It is not always encountered in Rb, and is commonly present in other tumors

With respect to Rb histology, another ‘-ette’ term is key. What is it?
‘Fleurette’

What are the three contexts in which the term ‘rosette’ is used?
- Flexner-Wintersteiner rosettes
- Pseudorosettes
- Homer Wright rosettes

With respect to Rb histology, another ‘-ette’ term is key. What is it?
‘Fleurette’

The histologic hallmark is the Homer Wright rosette
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births. **F**
- About 60% represent nonheritable mutations. **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative). **F**
- The exophytic type looks like Coats disease. **T**
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated. **F**
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present). **F**
- Periodic MRI brain is warranted to detect early 'trilateral' disease. **F**
- The Reese-Ellsworth classification system is the current preferred method for staging Rb. **F**
- Patients with Rb are more likely to die of a second malignancy than of Rb itself. **T**
- The histologic hallmark is the Homer-Wright rosette. **F**

What is a fleurette?

A small cluster of Rb cells that have differentiated into photoreceptor-like structures.

What does it look like?

It is a curvilinear structure, with extensions described as 'bulbous.'

Are fleurettes more, or less common than Flexner-Wintersteiner rosettes?

As fleurettes represent a more advanced form of tumor-cell differentiation, it should come as no surprise that they are less commonly encountered than Flexner-Wintersteiner rosettes.
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  **F**
- About 60% represent nonheritable mutations  **T**
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative)  **F**
- The exophytic type looks like Coats disease  **T**
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  **F**
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)  **F**
- Periodic MRI brain is warranted to detect early 'trilateral' disease  **F**
- The Reese-Ellsworth classification system is the current preferred method for staging Rb  **F**
- Patients with Rb are more likely to die of a second malignancy than of Rb itself  **T**
- The histologic hallmark is the Homer-Wright rosette  **F**

What is a fleurette?
A small cluster of Rb cells that have differentiated into photoreceptor-like structures

Again with respect to Rb histology, another ‘-ette’ term is key. What is it?

‘Fleurette’

Flexner-Wintersteiner rosette
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  \( \text{F} \)
- About 60% represent nonheritable mutations \( \text{T} \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\textsuperscript{o} relative) \( \text{F} \)
- The exophytic type looks like Coats disease \( \text{T} \)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap need not be obtained if enucleation is being contemplated \( \text{F} \)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) \( \text{F} \)
- Periodic MRI brain is warranted to detect early 'trilateral' disease \( \text{F} \)
- The Reese-Ellsworth classification system is the current preferred method for staging Rb \( \text{F} \)
- Patients with Rb are more likely to die of a second malignancy than of Rb itself \( \text{T} \)

What is a fleurette?
A small cluster of Rb cells that have differentiated into photoreceptor-like structures

What does it look like?
It is a curvilinear structure, with extensions described as 'bulbous'

Again with respect to Rb histology, another 'ette' term is key. What is it?

'Fleurette'
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( \text{F} \)
- About 60% represent nonheritable mutations \( \text{T} \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1° relative) \( \text{F} \)
- The exophytic type looks like Coats disease \( \text{T} \)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated \( \text{F} \)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) \( \text{F} \)
- Periodic MRI brain is warranted to detect early 'trilateral' disease \( \text{F} \)
- The Reese-Ellsworth classification system is the current preferred method for staging Rb \( \text{F} \)
- Patients with Rb are more likely to die of a second malignancy than of Rb itself \( \text{T} \)
- The histologic hallmark is the Homer-Wright rosette \( \text{F} \)

**What is a fleurette?**
A small cluster of Rb cells that have differentiated into photoreceptor-like structures

**What does it look like?**
It is a curvilinear structure, with extensions described as 'bulbous'

Again with respect to Rb histology, another ‘-ette’ term is key. What is it?

‘Fleurette’
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  \( ^F \)
- About 60% represent nonheritable mutations \( ^T \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{st}\) relative) \( ^F \)
- The exophytic type looks like Coats disease \( ^T \)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated \( ^F \)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) \( ^F \)
- Periodic MRI brain is warranted to detect early 'trilateral' disease \( ^F \)
- The Reese-Ellsworth classification system is the current preferred method for staging Rb \( ^F \)
- Patients with Rb are more likely to die of a second malignancy than of Rb itself \( ^T \)
- The histologic hallmark is the Homer-Wright rosette  \( ^F \)

**What is a fleurette?**
A small cluster of Rb cells that have differentiated into photoreceptor-like structures

**What does it look like?**
It is a curvilinear structure, with extensions described as ‘bulbous’

Again with respect to Rb histology, another ‘-ette’ term is key. What is it?

‘Fleurette’
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births \( F \)
- About 60% represent nonheritable mutations \( T \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\textsuperscript{st} relative) \( F \)
- The \textit{exophytic} type looks like Coats disease \( T \)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated \( F \)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) \( F \)
- Periodic MRI brain is warranted to detect early 'trilateral' disease \( F \)
- The Reese-Ellsworth classification system is the current preferred method for staging Rb \( F \)
- Patients with Rb are more likely to die of a second malignancy than of Rb itself \( T \)
- The histologic hallmark is the Homer-Wright rosette \( F \)

\textbf{Q}

\begin{itemize}
  \item What is a fleurette?
    A small cluster of Rb cells that have differentiated into photoreceptor-like structures
  \item What does it look like?
    It is a curvilinear structure, with extensions described as ‘bulbous’
  \item Are fleurettes more, or less common than Flexner-Wintersteiner rosettes?
    As fleurettes represent a more advanced form of tumor-cell differentiation, it should come as no surprise that they are less commonly encountered than Flexner-Wintersteiner rosettes
  \item Again with respect to Rb histology, another ‘-ette’ term is key. What is it?
    ‘Fleurette’
\end{itemize}
Concerning Rb, which of the following are true?

- The incidence is roughly 1/100,000 live births  F
- About 60% represent nonheritable mutations  T
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\textsuperscript{st} relative)  F
- The exophytic type looks like Coats disease  T
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated  F
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present)  F
- Periodic MRI brain is warranted to detect early 'trilateral' disease  F
- The Reese-Ellsworth classification system is the current preferred method for staging Rb  F
- Patients with Rb are more likely to die of a second malignancy than of Rb itself  T
- The histologic hallmark is the Homer-Wright rosette  F

What is a fleurette?
A small cluster of Rb cells that have differentiated into photoreceptor-like structures

What does it look like?
It is a curvilinear structure, with extensions described as ‘bulbous’

Are fleurettes more, or less common than Flexner-Wintersteiner rosettes?
- F As fleurettes represent a more advanced form of tumor-cell differentiation, it should come as no surprise that they are less commonly encountered than are Flexner-Wintersteiner rosettes

Again with respect to Rb histology, another ‘-ette’ term is key. What is it?

‘Fleurette’
Concerning Rb, which of the following are true?

- The incidence is roughly 1/400,000 live births \( \times \)
- About 60% represent nonheritable mutations \( \Box \)
- To diagnose a case as 'heritable,' family history must be positive (but not necessarily a 1\(^{\circ}\) relative) \( \times \)
- The exophytic type looks like Coats disease \( \Box \)
- Tissue diagnosis via fine-needle aspiration (FNA) or vitreous tap must be obtained if enucleation is being contemplated \( \times \)
- CT orbits has a role in purely intraocular Rb (i.e., even if no orbital extension is present) \( \times \)
- Periodic MRI brain is warranted to detect early 'trilateral' disease \( \times \)
- The Reese-Ellsworth classification system is the current preferred method for staging Rb \( \Box \)
- Patients with Rb are more likely to die of a second malignancy than of Rb itself \( \Box \)
- The histologic hallmark is the Homer Wright rosette \( \times \)

With respect to Rb histology, what is a fleurette?

A small cluster of Rb cells that have differentiated into photoreceptor-like structures.

What does it look like?

It is a curvilinear structure, with extensions described as ‘bulbous.’

Are fleurettes more, or less common than Flexner-Wintersteiner rosettes?

As fleurettes represent a more advanced form of tumor-cell differentiation, it should come as no surprise that they are less commonly encountered than are Flexner-Wintersteiner rosettes.

What is another ‘-ette’ term key in Rb histology?

‘Fleurette’