The first and only biologic FDA approved for first- and second-line MCRC[1]

Avastin:

A foundation for overall survival (OS) in first- and second-line MCRC when combined with IV 5-FU–based therapy

- Avastin is the only FDA-approved biologic to achieve the primary efficacy endpoints across 3 distinct IV 5-FU–based chemotherapy backbones in MCRC[2-4]
  - IFL (Phase III Study 2107; primary endpoint: OS)
  - FOLFOX4 (Phase III Study E3200; primary endpoint: OS)
  - IV 5-FU/LV (Phase II Study 0780; coprimary endpoint: TTP)

MCRC=metastatic colorectal cancer; IV=intravenous; 5-FU=5-fluorouracil; IFL=5-FU/leucovorin (LV)/irinotecan; FOLFOX4=5-FU/LV/oxaliplatin; TTP=time to progression.

Indication

Avastin is indicated for the first- or second-line treatment of patients with metastatic carcinoma of the colon or rectum in combination with intravenous 5-fluorouracil–based chemotherapy.

Boxed WARNINGS

- **Gastrointestinal (GI) perforation**
  - Serious and sometimes fatal GI perforation occurs at a higher incidence (up to 2.4%) in Avastin-treated patients compared to controls. Discontinue Avastin for GI perforation
- **Surgery and wound healing complications**
  - The incidence of wound healing and surgical complications, including serious and fatal complications, is increased in Avastin-treated patients
  - Discontinue in patients with wound dehiscence. Discontinue at least 28 days prior to elective surgery
  - Do not initiate Avastin for at least 28 days after surgery and until the surgical wound is fully healed
- **Hemorrhage**
  - Severe or fatal hemorrhage, hemoptysis, GI bleeding, CNS hemorrhage, and vaginal bleeding are increased in Avastin-treated patients. Do not administer Avastin to patients with serious hemorrhage or recent hemoptysis

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AVASTIN®
bevacizumab

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- **Gastrointestinal (GI) perforation**
  - — Serious and sometimes fatal GI perforation occurs at a higher incidence in Avastin-treated patients compared to controls
  - — The incidences of GI perforation ranged from 0.3% to 2.4% across clinical studies
  - — Discontinue Avastin in patients with GI perforation
- **Surgery and wound healing complications**
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  - — Do not initiate Avastin for at least 28 days after surgery and until the surgical wound is fully healed. The appropriate interval between termination of Avastin and subsequent elective surgery required to reduce the risks of impaired wound healing/wound dehiscence has not been determined
  - — Discontinue Avastin at least 28 days prior to elective surgery and in patients with wound healing complications requiring medical intervention
- **Hemorrhage**
  - — Severe or fatal hemorrhage, including hemoptysis, GI bleeding, hematemesis, central nervous system hemorrhage, epistaxis, and vaginal bleeding, occurred up to 5-fold more frequently in patients receiving Avastin. Across indications, the incidence of grade ≥3 hemorrhagic events among patients receiving Avastin ranged from 1.2% to 4.6%
  - — Do not administer Avastin to patients with serious hemorrhage or recent hemoptysis (≥1/2 tsp of red blood)
  - — Discontinue Avastin in patients with serious hemorrhage (ie, requiring medical intervention)

Additional serious adverse events

- Additional serious and sometimes fatal adverse events with increased incidence in the Avastin-treated arm vs control included
  - — Non-GI fistula formation (≤0.3%)
  - — Arterial thromboembolic events (grade ≥3, 2.4%)
  - — Proteinuria including nephrotic syndrome (<1%)
- Additional serious adverse events with increased incidence in the Avastin-treated arm vs control included
  - — Hypertension (grade 3–4, 5%–18%)
  - — Reversible posterior leukoencephalopathy syndrome (RPLS) (<0.1%)
- Infusion reactions with the first dose of Avastin were uncommon (<3%), and severe reactions occurred in 0.2% of patients
- Inform females of reproductive potential of the risk of ovarian failure prior to starting treatment with Avastin

Most common adverse events

- Most common adverse reactions observed in Avastin patients at a rate >10% and at least twice the control arm rate were
  - — Epistaxis
  - — Headache
  - — Hypertension
  - — Rhinitis
  - — Proteinuria
  - — Taste alteration
  - — Dry skin
  - — Rectal hemorrhage
  - — Lacrimation disorder
  - — Back pain
  - — Exfoliative dermatitis
- Across all studies, Avastin was discontinued in 8.4% to 21% of patients because of adverse reactions

Pregnancy warning

- Avastin may impair fertility
- Based on animal data, Avastin may cause fetal harm
- Advise patients of the potential risk to the fetus during and following Avastin and the need to continue adequate contraception for at least 6 months following the last dose of Avastin
- For nursing mothers, discontinue nursing or Avastin, taking into account the importance of Avastin to the mother
- The most common grade 3–4 events in Study 2107, which occurred at a ≥2% higher incidence in the Avastin plus IFL vs IFL groups, were asthenia (10% vs 7%), abdominal pain (8% vs 5%), pain (8% vs 5%), hypertension (12% vs 2%), deep vein thrombosis (9% vs 5%), intra-abdominal thrombosis (3% vs 1%), syncope (3% vs 1%), diarrhea (34% vs 25%), constipation (4% vs 2%), leukopenia (37% vs 31%), and neutropenia (21% vs 14%)
- The most common grade 3–5 (nonhematologic) and 4–5 (hematologic) events in Study E3200, which occurred at a higher incidence (≥2%) in the Avastin plus FOLFOX4 vs FOLFOX4 groups, were diarrhea (18% vs 13%), nausea (12% vs 5%), vomiting (11% vs 4%), dehydration (10% vs 5%), ileus (4% vs 1%), neuropathy–sensory (17% vs 9%), neurologic–other (5% vs 3%), fatigue (19% vs 13%), abdominal pain (8% vs 5%), headache (3% vs 0%), hypertension (9% vs 2%), and hemorrhage (5% vs 1%)

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References: 1. Avastin Prescribing Information. Genentech, Inc. September 2011. **2.** Hurwitz H, Fehrenbacher L, Novotny W, et al. *N Engl J Med.* 2004;350:2335-2342. **3.** Giantonio BJ, Catalano PJ, Meropol NJ, et al. *J Clin Oncol.* 2007;25:1539-1544. **4.** Kabbinavar F, Hurwitz H, Fehrenbacher L, et al. *J Clin Oncol.* 2003;21:60-65.

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AVASTIN® bevacizumab

In combination with IV 5-FU–based therapy:

Avastin is the only FDA-approved biologic with significant OS improvements in both first- and second-line MCRC[1-3]

Avastin: The only biologic to achieve the primary efficacy endpoints across 3 distinct IV 5-FU–based chemotherapy backbones in MCRC[2-4]

Data in combination with

IFL	FOLFOX4	IV 5-FU/LV
Phase III Study 2107 (Primary endpoint: OS)	Phase III Study E3200 (Primary endpoint: OS)	Phase II Study 0780* (Coprimary endpoint: TTP)

*Study 0780 (N=104): Coprimary endpoints=TTP and response rate (RR). TTP (9.0 vs 5.2 months, *P*=0.005) was significantly better for patients receiving Avastin (5 mg/kg) plus IV 5-FU vs IV 5-FU alone. RR (32% vs 17%, *P*=0.086) was not significantly different.[4]

- The National Comprehensive Cancer Network guidelines include bevacizumab as a first-line treatment option for MCRC in combination with FOLFOX, FOLFIRI, or IV 5-FU/LV[5]

Safety of Avastin in MCRC has been evaluated in 2 large Phase III pivotal trials[2,3]

Additional safety data collected in >5400 patients
across 3 large observational studies[6-9]

Real world experience
in >201,000 MCRC patients spanning >7 years[10]

- The #1 oncologist-prescribed biologic for first- and second-line MCRC based on chart review audit[11†]

IV=intravenous; 5-FU=5-fluorouracil; OS=overall survival; MCRC=metastatic colorectal cancer; IFL=5-FU/leucovorin (LV)/irinotecan; FOLFOX4=5-FU/LV/oxaliplatin; TTP=time to progression; FOLFIRI=5-FU/LV/irinotecan.

†Based on data from May 2010 to August 2011.

Indication

Avastin is indicated for the first- or second-line treatment of patients with metastatic carcinoma of the colon or rectum in combination with intravenous 5-fluorouracil–based chemotherapy.

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AVASTIN® bevacizumab

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AVASTIN® bevacizumab

In combination with IV 5-FU–based therapy in first-line MCRC:

Avastin is the only FDA-approved biologic with an overall survival (OS) benefit in first-line MCRC[1,2]

Indication

Avastin is indicated for the first- or second-line treatment of patients with metastatic carcinoma of the colon or rectum in combination with intravenous 5-fluorouracil–based chemotherapy.

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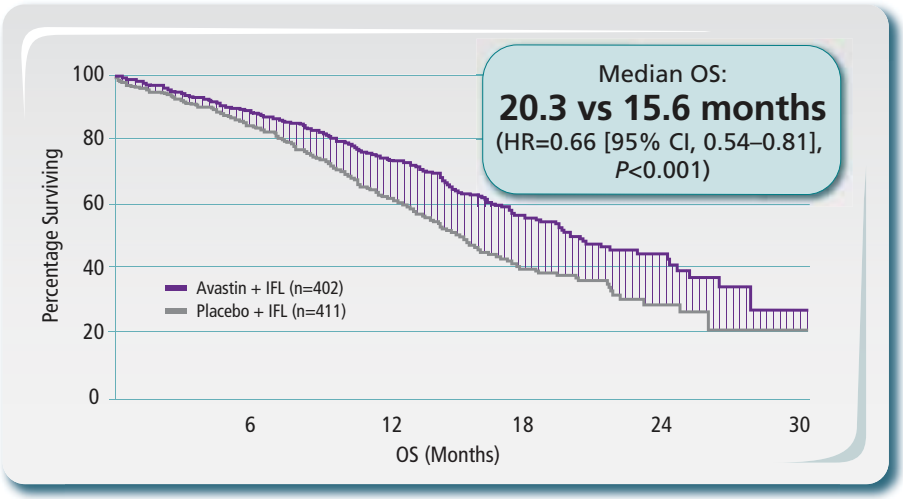
AVASTIN® bevacizumab

The only FDA-approved biologic with an OS benefit in first-line MCRC[1-3]

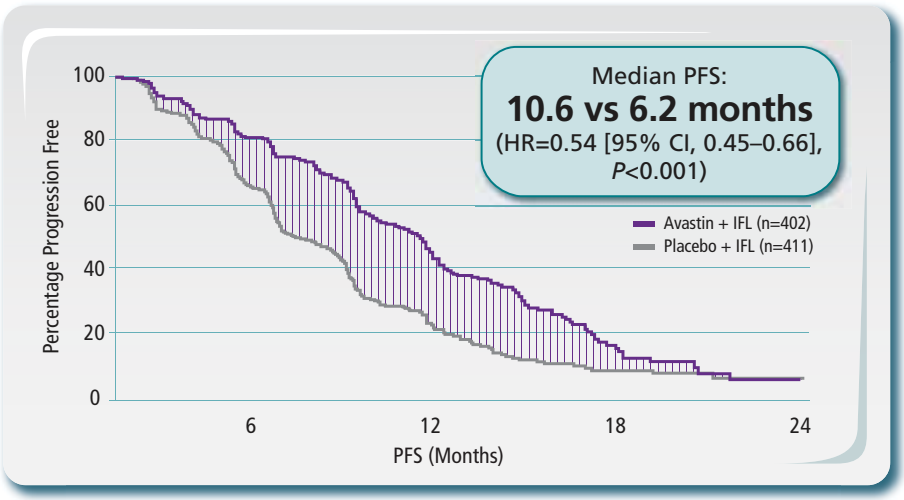
4.7-month increase in median OS with Avastin plus IFL in pivotal Study 2107[1,3]



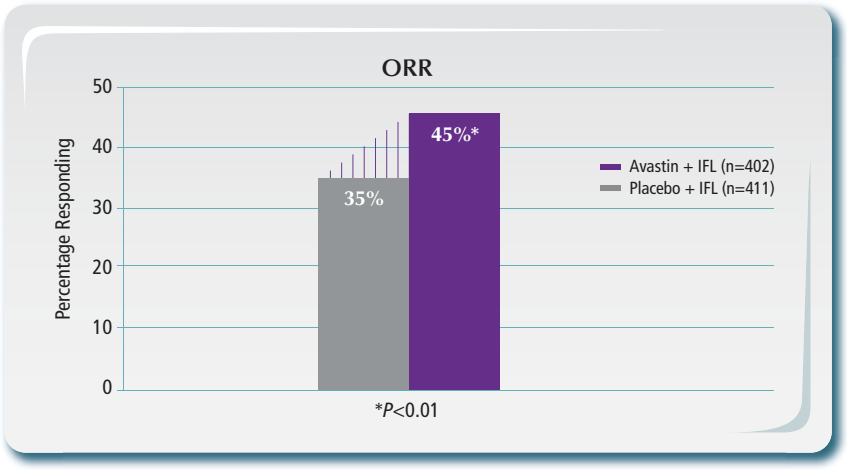
IV=intravenous; 5-FU=5-fluorouracil; MCRC=metastatic colorectal cancer; IFL=5-FU/leucovorin (LV)/irinotecan; HR=hazard ratio; CI=confidence interval.

- At 1 year, 74% of Avastin-treated patients were alive vs 63% of those receiving placebo plus IFL[2]
- At 2 years, 45% of Avastin-treated patients were alive vs 30% of those receiving placebo plus IFL[3]

4.4-month increase in median progression-free survival (PFS) with Avastin plus IFL[1-3]



Avastin plus IFL resulted in a significant increase in overall response rate (ORR) vs placebo plus IFL[1,2]



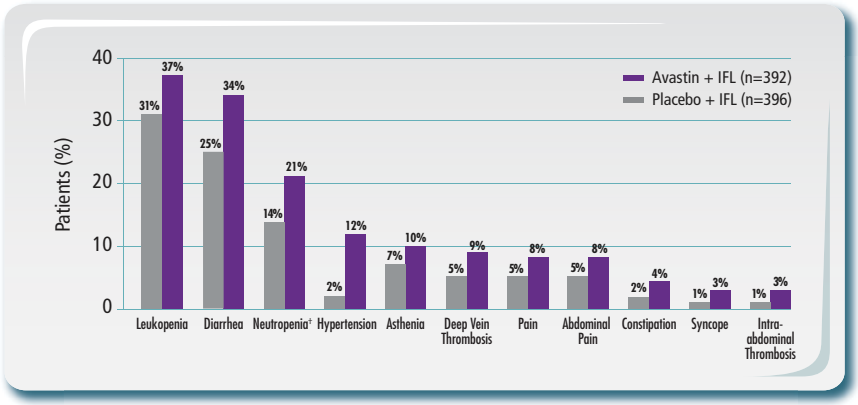
Retrospective k-ras analysis of available tissue samples from a subgroup of patients enrolled in Study 2107 (n=230; 28% of the overall population)[4]

Hazard ratios were consistent with those in the overall population regardless of k-ras status[4]

	k-ras wild-type tumors (n=152)	k-ras mutant tumors (n=78)
OS	HR=0.58, *P*=0.04	HR=0.69, *P*=0.26
PFS	HR=0.44, *P*<0.0001	HR=0.41, *P*=0.0008

- k-ras status does not predict clinical benefit from Avastin plus IV 5-FU–based therapy[4]
- These findings have not been confirmed prospectively in a large clinical trial[4]

Avastin plus IFL (first-line MCRC) Selected grade 3–4 adverse events (≥2% higher incidence in the Avastin arm)[1]



†Central laboratories were collected on days 1 and 21 of each cycle. Neutrophil counts were available in 303 patients receiving placebo plus IFL and 276 patients receiving Avastin plus IFL.

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AVASTIN® bevacizumab

Avastin in combination with IV 5-FU–based therapy for the first-line treatment of MCRC

Pivotal Study 2107[2]

- Avastin 5 mg/kg IV every 2 weeks (q2w) plus IFL vs placebo plus IFL
- Primary endpoint: OS
- Secondary endpoints: PFS, ORR, duration of response, quality of life, safety

First-line Study NO16966

- Avastin 5 mg/kg IV q2w plus FOLFOX4 vs placebo plus FOLFOX4[5]
- Coprimary endpoint: PFS for Avastin plus chemotherapy vs placebo plus chemotherapy[5]
- Secondary endpoints: Efficacy and safety for patients receiving Avastin plus FOLFOX4 vs placebo plus FOLFOX4[5,6]

In Study NO16966, the efficacy of the first-line Avastin plus FOLFOX4 subgroup was evaluated as part of a coprimary study objective[5]

- Study NO16966 was a Phase III, randomized, placebo-controlled clinical trial that evaluated Avastin plus oxaliplatin-based chemotherapy vs placebo plus oxaliplatin-based chemotherapy, including FOLFOX4[5]
  - The coprimary endpoint was PFS
- A prespecified analysis included "general" PFS and "on-treatment" PFS[5]
  - The **general** PFS analysis included all patients randomized to treatment[5]
  - The **on-treatment** PFS analysis evaluated patients who received the study drug until disease progression or unacceptable toxicity, as specified in the study protocol for both the Avastin- and placebo-containing arms[5,7]

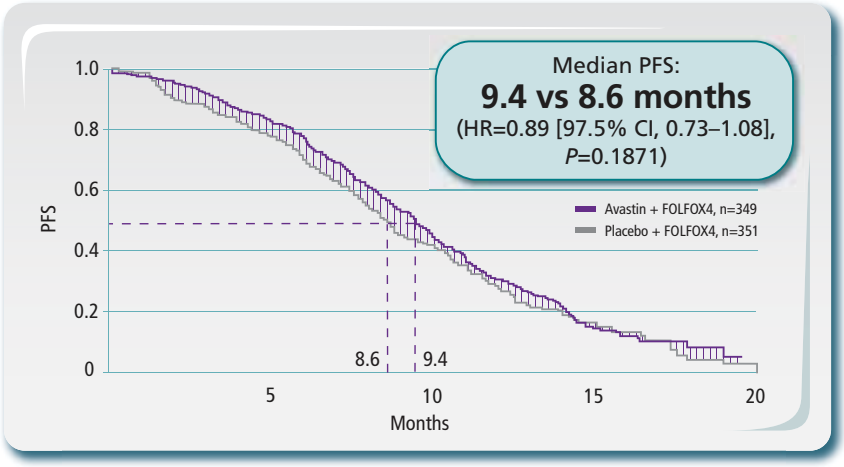
FOLFOX4=5-FU/LV/oxaliplatin.

Additional serious adverse events

- Additional serious and sometimes fatal adverse events with increased incidence in the Avastin-treated arm vs control included
  - Non-GI fistula formation (≤0.3%)
  - Arterial thromboembolic events (grade ≥3, 2.4%)
  - Proteinuria including nephrotic syndrome (<1%)
- Additional serious adverse events with increased incidence in the Avastin-treated arm vs control included
  - Hypertension (grade 3–4, 5%–18%)
  - Reversible posterior leukoencephalopathy syndrome (RPLS) (<0.1%)
- Infusion reactions with the first dose of Avastin were uncommon (<3%), and severe reactions occurred in 0.2% of patients
- Inform females of reproductive potential of the risk of ovarian failure prior to starting treatment with Avastin

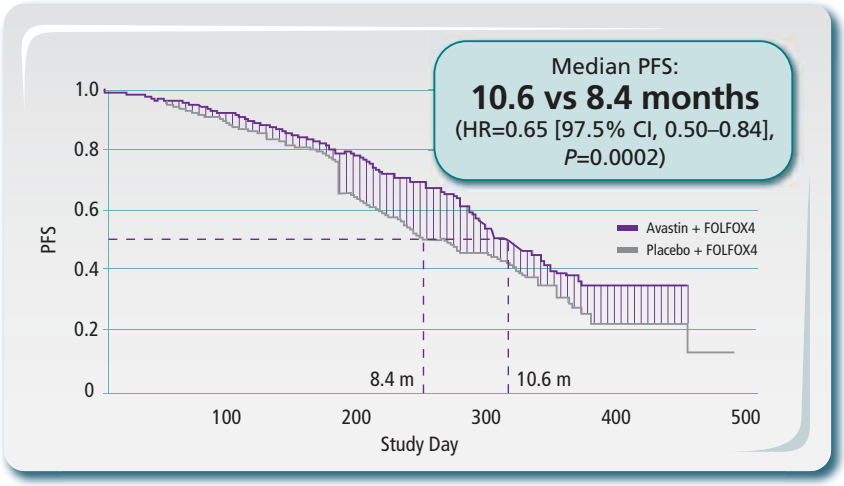
In Study NO16966, both general and on-treatment PFS were analyzed in the Avastin plus FOLFOX4 subgroup[7]

General PFS (all patients)[7]



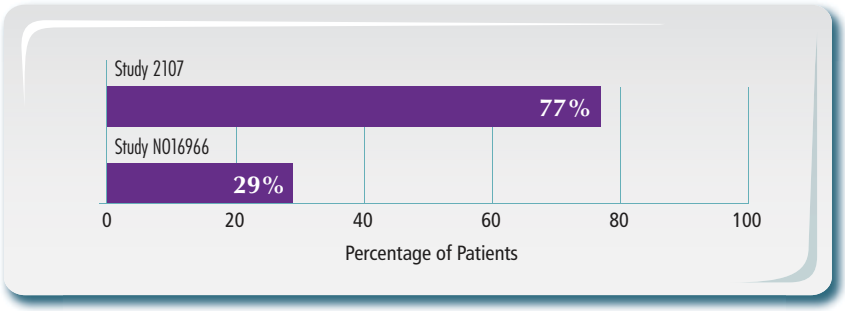
- The **general** PFS analysis demonstrated a 0.8-month (9%) increase in median PFS with Avastin plus FOLFOX4 vs placebo plus FOLFOX4, a difference that was not statistically significant (9.4 vs 8.6 months, *P*=0.1871)[7]

On-treatment PFS (patients treated until disease progression)[7]



- The **on-treatment** PFS analysis demonstrated a statistically significant increase of 2.2 months (26%) in median PFS for Avastin plus FOLFOX4 vs placebo plus FOLFOX4 (10.6 vs 8.4 months, *P*=0.0002)[7]

Percentage of patients treated to disease progression[5,8]



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AVASTIN® bevacizumab

NCCN guidelines include bevacizumab as a first-line treatment option in combination with multiple IV 5-FU–based chemotherapy foundations[9]

First-line MCRC	Bevacizumab plus:
	• FOLFOX • FOLFIRI • IV 5-FU/LV

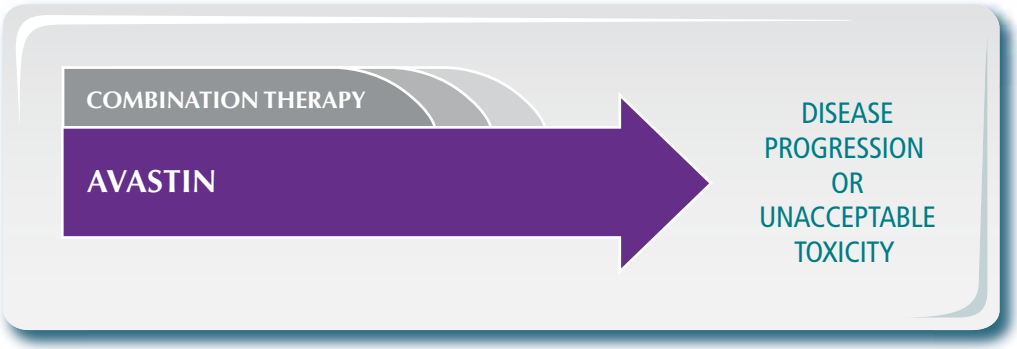
NCCN=National Comprehensive Cancer Network; FOLFIRI=5-FU/LV/irinotecan.

Survival benefits were achieved with Avastin administered until disease progression or unacceptable toxicity and at the approved dose[1,2]

Duration of treatment

FDA-approved prescribing information for the duration of Avastin treatment[1]

"Patients should continue treatment until disease progression or unacceptable toxicity."



In first- and second-line MCRC, Avastin is indicated in combination with IV 5-FU–containing chemotherapy.[1]

Established Avastin doses in pivotal Phase III MCRC trials[1]

- Avastin is administered as a solution for IV infusion at the following doses

Chemotherapy regimen	Recommended dose	Schedule
IFL* (Study 2107)	5 mg/kg IV	q2w
FOLFOX4† (Study E3200)	10 mg/kg IV	q2w

*5 mg/kg IV dose evaluated in first-line MCRC in combination with IFL.
†10 mg/kg IV dose evaluated in second-line MCRC in combination with FOLFOX4.

Important treatment considerations—Dose modifications

- There are no recommended dose reductions
- Discontinue Avastin in patients with
  - **Gastrointestinal (GI) perforations (GI perforations, fistula formation in the GI tract, intra-abdominal abscess)**
  - Fistula formation involving an internal organ
  - **Wound dehiscence and wound healing complications requiring medical intervention**
  - **Serious hemorrhage (ie, requiring medical intervention)**
  - Severe arterial thromboembolic event (ATE)
  - Hypertensive crisis or hypertensive encephalopathy
  - Reversible posterior leukoencephalopathy syndrome (RPLS) (symptoms usually resolve or improve within days, although some patients have experienced ongoing neurologic sequelae)
  - Nephrotic syndrome
- Temporarily suspend Avastin for at least 4 weeks prior to elective surgery, severe hypertension not controlled with medical management, moderate to severe proteinuria pending further evaluation, and severe infusion reactions
- The safety of resumption of Avastin therapy in patients that experienced RPLS, ATE, and moderate to severe proteinuria is unknown

Important treatment considerations—Women of childbearing potential

- Avastin increases the risk of ovarian failure and may impair fertility
- Inform females of reproductive potential of the risk of ovarian failure prior to starting treatment with Avastin
- Long-term effects of Avastin exposure on fertility are unknown
- Prior to initiation of therapy, advise patients of the potential risk of Avastin to the developing fetus
- Counsel patients who become pregnant about the possible risks, including hazard to the fetus and/or loss of pregnancy, of both continued treatment and prolonged exposure following discontinuation, keeping in mind the approximate half-life of Avastin (20 days; range 11–50 days). Patients should also be counseled to continue adequate contraception for at least 6 months following the last dose of Avastin
- Nursing mothers should be advised to discontinue nursing or Avastin, taking into account the half-life of the product and the importance of Avastin to the mother

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AVASTIN® bevacizumab

Genentech is committed to providing practices and eligible patients with reimbursement and coverage support

AVASTIN® bevacizumab Access Solutions®

Coverage and Reimbursement

- Help with benefits and coverage issues
  - — Benefits investigation
  - — Prior authorization
  - — Recertification
- Help with reimbursement issues
  - — Denials and appeals
  - — Billing and coding information

Patient Assistance

- Genentech® Access to Care Foundation (GATCF) support for qualifying uninsured and rendered uninsured patients
- Referrals to independent, non-profit organizations for co-pay assistance
- Genentech BioOncology Co-pay Card
- Avastin Patient Assistance Program
- Cancer*Care*

Informational Resources

- My Patient Solutions, our online patient management tool
- Communication assistance services
  - — Translation services
  - — Telephone to telephone typewriter (TTY) services
- Product spoilage and replacement information
- Medicare/Medicaid search tool
- Glossary of access and reimbursement terms

To speak live with one of our specialists, call **(888) 249-4918** from 6 AM to 5 PM PT, Monday to Friday, or visit **AvastinAccessSolutions.com**

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  - The incidences of GI perforation ranged from 0.3% to 2.4% across clinical studies
  - Discontinue Avastin in patients with GI perforation
- **Surgery and wound healing complications**
  - The incidence of wound healing and surgical complications, including serious and fatal complications, is increased in Avastin-treated patients
  - Do not initiate Avastin for at least 28 days after surgery and until the surgical wound is fully healed. The appropriate interval between termination of Avastin and subsequent elective surgery required to reduce the risks of impaired wound healing/wound dehiscence has not been determined
  - Discontinue Avastin at least 28 days prior to elective surgery and in patients with wound healing complications requiring medical intervention
- **Hemorrhage**
  - Severe or fatal hemorrhage, including hemoptysis, GI bleeding, hematemesis, central nervous system hemorrhage, epistaxis, and vaginal bleeding, occurred up to 5-fold more frequently in patients receiving Avastin. Across indications, the incidence of grade ≥3 hemorrhagic events among patients receiving Avastin ranged from 1.2% to 4.6%
  - Do not administer Avastin to patients with serious hemorrhage or recent hemoptysis (≥1/2 tsp of red blood)
  - Discontinue Avastin in patients with serious hemorrhage (ie, requiring medical intervention)

Additional serious adverse events

- Additional serious and sometimes fatal adverse events with increased incidence in the Avastin-treated arm vs control included
  - Non-GI fistula formation (≤0.3%)
  - Arterial thromboembolic events (grade ≥3, 2.4%)
  - Proteinuria including nephrotic syndrome (<1%)
- Additional serious adverse events with increased incidence in the Avastin-treated arm vs control included
  - Hypertension (grade 3–4, 5%–18%)
  - Reversible posterior leukoencephalopathy syndrome (RPLS) (<0.1%)
- Infusion reactions with the first dose of Avastin were uncommon (<3%), and severe reactions occurred in 0.2% of patients
- Inform females of reproductive potential of the risk of ovarian failure prior to starting treatment with Avastin

Most common adverse events

- Most common adverse reactions observed in Avastin patients at a rate >10% and at least twice the control arm rate were
  - Epistaxis
  - Headache
  - Hypertension
  - Rhinitis
  - Proteinuria
  - Taste alteration
  - Dry skin
  - Rectal hemorrhage
  - Lacrimation disorder
  - Back pain
  - Exfoliative dermatitis
- Across all studies, Avastin was discontinued in 8.4% to 21% of patients because of adverse reactions

Pregnancy warning

- Avastin may impair fertility
- Based on animal data, Avastin may cause fetal harm
- Advise patients of the potential risk to the fetus during and following Avastin and the need to continue adequate contraception for at least 6 months following the last dose of Avastin
- For nursing mothers, discontinue nursing or Avastin, taking into account the importance of Avastin to the mother

Please see accompanying full Prescribing Information, including **Boxed WARNINGS**, for additional important safety information.

AVASTIN® bevacizumab

Avastin: Experience that matters

- Avastin plus IV 5-FU–based therapy is the only FDA-approved biologic to demonstrate statistically significant improvements in OS, PFS, and ORR in first-line MCRC[1,2]
- Avastin is the only FDA-approved biologic with an OS benefit in first-line MCRC[1,2]
- OS benefits were achieved with Avastin administered until disease progression or unacceptable toxicity[1,2]

Boxed WARNINGS

- **Gastrointestinal (GI) perforation**
  - — Serious and sometimes fatal GI perforation occurs at a higher incidence (up to 2.4%) in Avastin-treated patients compared to controls. Discontinue Avastin for GI perforation
- **Surgery and wound healing complications**
  - — The incidence of wound healing and surgical complications, including serious and fatal complications, is increased in Avastin-treated patients
  - — Discontinue in patients with wound dehiscence. Discontinue at least 28 days prior to elective surgery
  - — Do not initiate Avastin for at least 28 days after surgery and until the surgical wound is fully healed
- **Hemorrhage**
  - — Severe or fatal hemorrhage, hemoptysis, GI bleeding, CNS hemorrhage, and vaginal bleeding are increased in Avastin-treated patients. Do not administer Avastin to patients with serious hemorrhage or recent hemoptysis

Please see accompanying full Prescribing Information, including **Boxed WARNINGS**, and page 9 for additional important safety information.

References: 1. Avastin Prescribing Information. Genentech, Inc. September 2011. **2.** Hurwitz H, Fehrenbacher L, Novotny W, et al. *N Engl J Med.* 2004;350:2335-2342. **3.** Data on file. Genentech, Inc. **4.** Hurwitz HI, Yi J, Ince W, et al. *Oncologist.* 2009;14:1-7. **5.** Saltz LB, Clarke S, Díaz-Rubio E, et al. *J Clin Oncol.* 2008;26:2013-2019. **6.** Saltz L, Clarke S, Díaz-Rubio E, et al. Poster presented at: 9th World Congress on Gastrointestinal Cancer; June 27-30, 2007; Barcelona, Spain. **7.** Saltz LB, Clarke S, Diaz-Rubio E, et al. Proceedings of the 2007 Gastrointestinal Cancers Symposium; January 19-21, 2007 Orlando, FL; (suppl, abstr 238) and associated slide presentation. **8.** Cassidy J, Clarke S, Diaz Rubio E, et al. *Ann Oncol.* 2006;17(suppl 9; abstr LBA3). **9.** The NCCN Colon Cancer Clinical Practice Guidelines in Oncology (Version 1.2012). ©2011 National Comprehensive Cancer Network, Inc. http://www.nccn.org. Accessed November 3, 2011. To view the most recent and complete version of the guidelines, go online to www.nccn.org.

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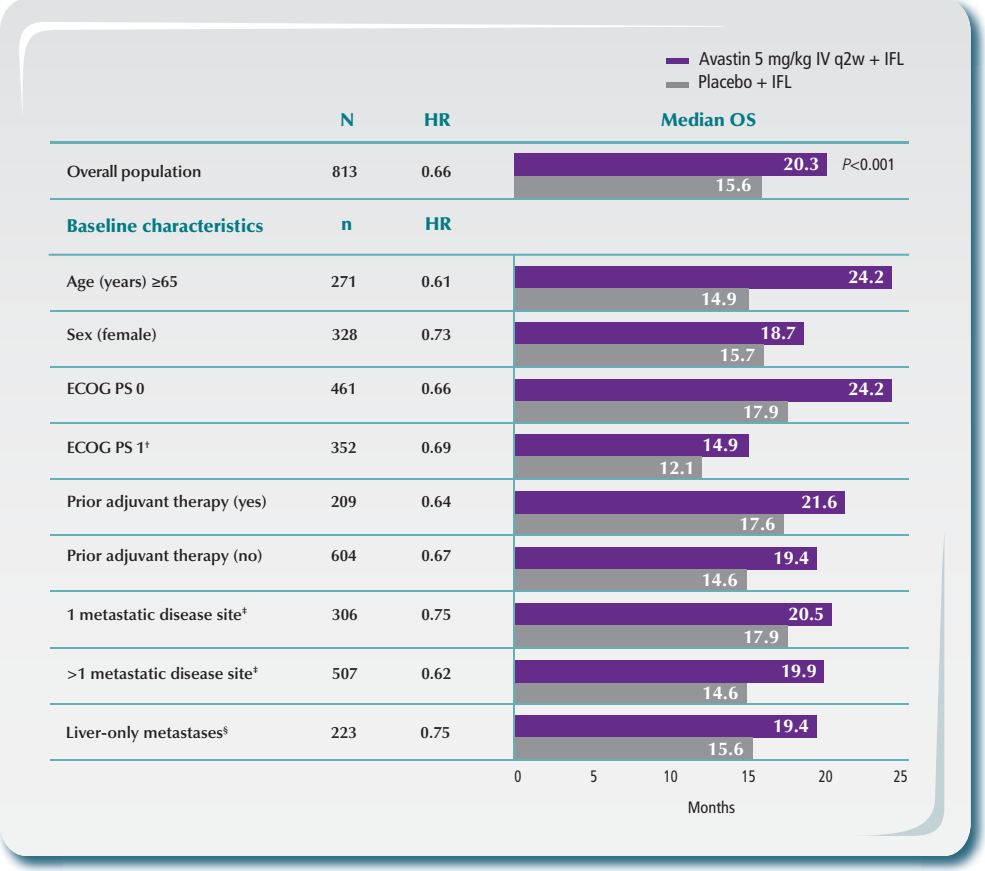
AVASTIN® bevacizumab

Avastin plus IV 5-FU–based therapy: Consistent first-line OS benefits across multiple MCRC patient subgroups[1-3]

At 20.3 months, Avastin plus IFL provided a statistically significant increase in median OS vs placebo plus IFL[1]

OS demonstrated across a broad range of prespecified subgroups[1-3]*



IV=intravenous; 5-FU=5-fluorouracil; OS=overall survival; MCRC=metastatic colorectal cancer; IFL=5-FU/leucovorin (LV)/irinotecan; ECOG PS=Eastern Cooperative Oncology Group performance status; q2w=every 2 weeks; HR=hazard ratio.

*All were prespecified analyses, with the exception of the liver-only disease subgroup analysis. Additional prespecified subgroups with survival increases included age <40, ages 40–64, race, location of primary tumor, duration of metastatic disease, baseline albumin, baseline alkaline phosphatase, baseline lactate dehydrogenase, duration of disease, sum of the longest diameters of target lesions, and prior radiotherapy.[2]

†Eligible patients had an ECOG PS of 0 or 1, with less than 1% (n=3) of the study population having an ECOG score of >1.

‡The organs with the most frequent occurrence of metastatic disease were liver (78%), lung (48%), and lymph nodes (25%).[2]

§Based on an exploratory analysis of prospectively collected data.

Indication

Avastin is indicated for the first- or second-line treatment of patients with metastatic carcinoma of the colon or rectum in combination with intravenous 5-fluorouracil–based chemotherapy.

Boxed WARNINGS

- **Gastrointestinal (GI) perforation**
  - — Serious and sometimes fatal GI perforation occurs at a higher incidence (up to 2.4%) in Avastin-treated patients compared to controls. Discontinue Avastin for GI perforation
- **Surgery and wound healing complications**
  - — The incidence of wound healing and surgical complications, including serious and fatal complications, is increased in Avastin-treated patients
  - — Discontinue in patients with wound dehiscence. Discontinue at least 28 days prior to elective surgery
  - — Do not initiate Avastin for at least 28 days after surgery and until the surgical wound is fully healed
- **Hemorrhage**
  - — Severe or fatal hemorrhage, hemoptysis, GI bleeding, CNS hemorrhage, and vaginal bleeding are increased in Avastin-treated patients. Do not administer Avastin to patients with serious hemorrhage or recent hemoptysis

Please see accompanying full Prescribing Information, including **Boxed WARNINGS**, and page 5 for additional important safety information.

AVASTIN® bevacizumab

First-line Study 2107 included a broad range of patients eligible for Avastin plus IFL[2]

	Avastin + IFL (n=402)	Placebo + IFL (n=411)
Baseline characteristics		
Age (years) ≥65	32%	34%
Sex (female)	41%	40%
ECOG PS*		
0	58%	55%
1	41%	44%
Metastatic disease sites†		
1	37%	39%
>1	63%	62%
Liver-only metastases	38%	39%
Prior cancer treatments		
Systemic adjuvant chemotherapy	24%	28%
Surgery	87%	88%
Radiotherapy	15%	14%

*Avastin plus IFL: n=401.
†Placebo plus IFL: n=409.

Select patient eligibility criteria for pivotal Study 2107 included[1,2‡]:

Selected inclusion criteria	Age ≥18 years
	Confirmed MCRC
	ECOG PS of 0 or 1
	Life expectancy >3 months
Selected exclusion criteria	Major surgery within 28 days of study initiation
	Clinically significant cardiovascular disease[§]
	Pregnancy or lactation
	Pre-existing bleeding diatheses or coagulopathy
	Known central nervous system metastases or history of stroke
	Serious, nonhealing wound, ulcer, or bone fracture
	Inadequate hematologic, hepatic, or renal function
	Proteinuria at baseline or clinically significant impairment of renal function

‡This table summarizes selected inclusion/exclusion criteria but does not include all criteria measured.
§Included uncontrolled hypertension, myocardial infarction, unstable angina, New York Heart Association grade 2 or greater congestive heart failure, serious cardiac arrhythmia requiring medication, or grade 2 or greater peripheral vascular disease within 1 year prior to day 0.[2]

FDAC administration in Avastin-treated patients

Use of anticoagulation

- Patients with pre-existing bleeding diatheses, coagulopathy, or regular use of aspirin (>325 mg/day) were excluded[1,2]
- Patients receiving full-dose anticoagulation (FDAC) were excluded from the pivotal MCRC trials[2]
  - — A number of patients who entered these trials required FDAC, and the studies were later amended to include patients already receiving anticoagulant therapy
- In Study 2107, 53 patients (14%) in the Avastin plus IFL arm and 30 patients (8%) in the placebo plus IFL arm received full-dose warfarin following a venous thromboembolic event (VTE)[3]
  - — An analysis of these patients showed no increased risk of bleeding complications with concomitant use of Avastin and FDAC[2]
- In a second, randomized, 4-arm study in 1401 patients with MCRC prospectively evaluating the incidence of VTEs (all grades), the overall incidence of the first VTE was higher in the Avastin-containing arms (13.5%) than in the chemotherapy alone arms (9.6%)[3]
  - — Among the 116 patients treated with anticoagulants following an initial VTE (73 in the Avastin plus chemotherapy arms and 43 in the chemotherapy alone arms), the overall incidence of subsequent VTEs was also higher among the Avastin-treated patients (31.5% vs 25.6%). In this subgroup of patients treated with anticoagulants, the overall incidence of bleeding, the majority of which was grade 1, was higher in the Avastin-treated arms than in the chemotherapy alone arms (27.4% vs 20.9%)[3]
- Patients receiving low-dose aspirin (<325 mg/day) were allowed in MCRC trials[2]
  - — In a pooled analysis of 3 randomized MCRC trials,[II] the risk of bleeding appeared to be similar between patients taking Avastin and low-dose aspirin and those who received Avastin without low-dose aspirin[4]

[II]Pooled analysis including first-line Phase III Study 2107,[1] first-line Phase II Study 0780 (Kabbinavar F, et al. *J Clin Oncol*, 2003), and first-line Phase II Study 2192 (Kabbinavar FF, et al. *J Clin Oncol*, 2005).[4]

Risk of bleeding with low-dose aspirin in patients receiving Avastin[2]

- Grade 1–2 bleeding occurred in 52% (177/341) of Avastin-treated patients who did not receive aspirin vs 49% (18/37) of Avastin-treated patients who received low-dose aspirin prior to study
- Grade 3–4 bleeding occurred in 4% (26/600) of Avastin-treated patients who did not receive aspirin vs 3% (2/68) of Avastin-treated patients who received low-dose aspirin prior to study

Additional serious adverse events

- Additional serious and sometimes fatal adverse events with increased incidence in the Avastin-treated arm vs control included
  - — Non-GI fistula formation (≤0.3%)
  - — Arterial thromboembolic events (grade ≥3, 2.4%)
  - — Proteinuria including nephrotic syndrome (<1%)
- Additional serious adverse events with increased incidence in the Avastin-treated arm vs control included
  - — Hypertension (grade 3–4, 5%–18%)
  - — Reversible posterior leukoencephalopathy syndrome (RPLS) (<0.1%)
- Infusion reactions with the first dose of Avastin were uncommon (<3%), and severe reactions occurred in 0.2% of patients
- Inform females of reproductive potential of the risk of ovarian failure prior to starting treatment with Avastin

Please see accompanying full Prescribing Information, including **Boxed WARNINGS**, and page 5 for additional important safety information.

AVASTIN® bevacizumab

Resection of metastases with bevacizumab-based therapy is included in the NCCN guidelines for colorectal cancer[5]

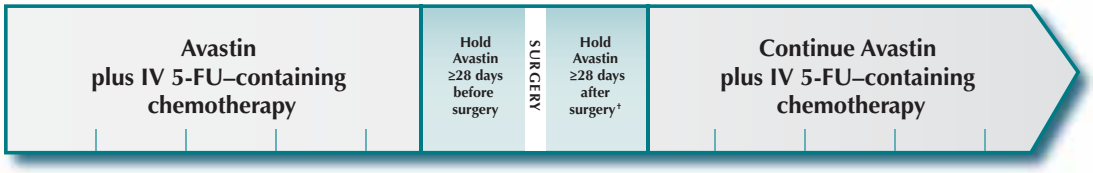
[Initially] Unresectable patients	Bevacizumab with either FOLFIRI or FOLFOX as an option [Re-evaluate for conversion to resection]
[Initially] Resectable patients	Colectomy and synchronous or staged liver (or lung) resection or Neoadjuvant chemotherapy,* such as bevacizumab with either FOLFIRI or FOLFOX, followed by synchronous or staged colectomy with liver (or lung) resection or Colectomy followed by adjuvant chemotherapy, such as bevacizumab with either FOLFIRI or FOLFOX, and a staged resection of metastatic disease

Adapted from National Comprehensive Cancer Network (NCCN) Colon Cancer Clinical Practice Guidelines.
FOLFIRI=5-FU/LV/irinotecan; FOLFOX=5-FU/LV/oxaliplatin.
*Treatment given before surgery to reduce the size of the tumor.

- Patients with liver-only metastases were included in Study 2107[2]
  - — As few as 10% of MCRC patients may be candidates for liver resection[5-7]

Avastin treatment considerations for resectable first-line MCRC patients

FDA-approved Prescribing Information treatment timeline to address surgery and wound healing complications[3]



†Hold Avastin for 28 days and until incision is fully healed.

- Avastin therapy should not be initiated for at least 28 days following major surgery. The surgical incision should be fully healed prior to initiation of Avastin[3]
- The appropriate interval between discontinuation of Avastin and subsequent elective surgery required to reduce the risk of impaired wound healing/wound dehiscence has not been determined. The calculated half-life of Avastin (≈20 days; range 11–50 days) should be taken into consideration. Suspend Avastin for at least 28 days prior to elective surgery[3]

Most common adverse events

- Most common adverse reactions observed in Avastin patients at a rate >10% and at least twice the control arm rate were
  - — Epistaxis
  - — Headache
  - — Hypertension
  - — Rhinitis
  - — Proteinuria
  - — Taste alteration
  - — Dry skin
  - — Rectal hemorrhage
  - — Lacrimation disorder
  - — Back pain
  - — Exfoliative dermatitis
- Across all studies, Avastin was discontinued in 8.4% to 21% of patients because of adverse reactions

Boxed WARNINGS

- **Gastrointestinal (GI) perforation**
  - Serious and sometimes fatal GI perforation occurs at a higher incidence in Avastin-treated patients compared to controls
  - The incidences of GI perforation ranged from 0.3% to 2.4% across clinical studies
  - Discontinue Avastin in patients with GI perforation
- **Surgery and wound healing complications**
  - The incidence of wound healing and surgical complications, including serious and fatal complications, is increased in Avastin-treated patients
  - Do not initiate Avastin for at least 28 days after surgery and until the surgical wound is fully healed. The appropriate interval between termination of Avastin and subsequent elective surgery required to reduce the risks of impaired wound healing/wound dehiscence has not been determined
  - Discontinue Avastin at least 28 days prior to elective surgery and in patients with wound healing complications requiring medical intervention
- **Hemorrhage**
  - Severe or fatal hemorrhage, including hemoptysis, GI bleeding, hematemesis, central nervous system hemorrhage, epistaxis, and vaginal bleeding, occurred up to 5-fold more frequently in patients receiving Avastin. Across indications, the incidence of grade ≥3 hemorrhagic events among patients receiving Avastin ranged from 1.2% to 4.6%
  - Do not administer Avastin to patients with serious hemorrhage or recent hemoptysis (≥1/2 tsp of red blood)
  - Discontinue Avastin in patients with serious hemorrhage (ie, requiring medical intervention)

Additional serious adverse events

- Additional serious and sometimes fatal adverse events with increased incidence in the Avastin-treated arm vs control included
  - Non-GI fistula formation (≤0.3%)
  - Arterial thromboembolic events (grade ≥3, 2.4%)
  - Proteinuria including nephrotic syndrome (<1%)
- Additional serious adverse events with increased incidence in the Avastin-treated arm vs control included
  - Hypertension (grade 3–4, 5%–18%)
  - Reversible posterior leukoencephalopathy syndrome (RPLS) (<0.1%)
- Infusion reactions with the first dose of Avastin were uncommon (<3%), and severe reactions occurred in 0.2% of patients
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Most common adverse events

- Most common adverse reactions observed in Avastin patients at a rate >10% and at least twice the control arm rate were
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  - Rhinitis
  - Proteinuria
  - Taste alteration
  - Dry skin
  - Rectal hemorrhage
  - Lacrimation disorder
  - Back pain
  - Exfoliative dermatitis
- Across all studies, Avastin was discontinued in 8.4% to 21% of patients because of adverse reactions

Pregnancy warning

- Avastin may impair fertility
- Based on animal data, Avastin may cause fetal harm
- Advise patients of the potential risk to the fetus during and following Avastin and the need to continue adequate contraception for at least 6 months following the last dose of Avastin
- For nursing mothers, discontinue nursing or Avastin, taking into account the importance of Avastin to the mother
- The most common grade 3–4 events in Study 2107, which occurred at a ≥2% higher incidence in the Avastin plus IFL vs IFL groups, were asthenia (10% vs 7%), abdominal pain (8% vs 5%), pain (8% vs 5%), hypertension (12% vs 2%), deep vein thrombosis (9% vs 5%), intra-abdominal thrombosis (3% vs 1%), syncope (3% vs 1%), diarrhea (34% vs 25%), constipation (4% vs 2%), leukopenia (37% vs 31%), and neutropenia (21% vs 14%)

Please see accompanying full Prescribing Information, including **Boxed WARNINGS**, for additional important safety information.

AVASTIN® bevacizumab

Avastin: Experience that matters

- **Avastin plus IV 5-FU–based therapy: Consistent first-line OS benefits across multiple MCRC patient subgroups[1-3]**
- **Avastin is the only FDA-approved biologic with an OS benefit in first-line MCRC[1,3]**
- **Resection of metastases with bevacizumab-based therapy is included in the NCCN guidelines for colorectal cancer[5]**

Boxed WARNINGS

- **Gastrointestinal (GI) perforation**
  - — Serious and sometimes fatal GI perforation occurs at a higher incidence (up to 2.4%) in Avastin-treated patients compared to controls. Discontinue Avastin for GI perforation
- **Surgery and wound healing complications**
  - — The incidence of wound healing and surgical complications, including serious and fatal complications, is increased in Avastin-treated patients
  - — Discontinue in patients with wound dehiscence. Discontinue at least 28 days prior to elective surgery
  - — Do not initiate Avastin for at least 28 days after surgery and until the surgical wound is fully healed
- **Hemorrhage**
  - — Severe or fatal hemorrhage, hemoptysis, GI bleeding, CNS hemorrhage, and vaginal bleeding are increased in Avastin-treated patients. Do not administer Avastin to patients with serious hemorrhage or recent hemoptysis

Please see accompanying full Prescribing Information, including **Boxed WARNINGS**, and page 5 for additional important safety information.

References: 1. Hurwitz H, Fehrenbacher L, Novotny W, et al. *N Engl J Med*. 2004;350:2335-2342. **2.** Data on file. Genentech, Inc. **3.** Avastin Prescribing Information. Genentech, Inc. September 2011. **4.** Scappaticci FA, Skillings JR, Holden SN, et al. *J Natl Cancer Inst.* 2007;99:1232-1239. **5.** The NCCN Colon Cancer Clinical Practice Guidelines in Oncology (Version 2.2012). ©2011 National Comprehensive Cancer Network, Inc. http://www.nccn.org. Accessed November 3, 2011. To view the most recent and complete version of the guidelines, go online to www.nccn.org. **6.** Vibert E, Canedo L, Adam R. *Semin Oncol*. 2005;32(6)(suppl 8):33-39. **7.** Adam R, Delvart V, Pascal G, et al. *Ann Surg*. 2004;240:644-658.

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AVASTIN® bevacizumab

In combination with FOLFOX4 in second-line MCRC:

Avastin is the only FDA-approved biologic with an overall survival (OS) benefit in second-line MCRC[1,2]

Indication

Avastin is indicated for the first- or second-line treatment of patients with metastatic carcinoma of the colon or rectum in combination with intravenous 5-fluorouracil–based chemotherapy.

Boxed WARNINGS

- **Gastrointestinal (GI) perforation**
  - — Serious and sometimes fatal GI perforation occurs at a higher incidence (up to 2.4%) in Avastin-treated patients compared to controls. Discontinue Avastin for GI perforation
- **Surgery and wound healing complications**
  - — The incidence of wound healing and surgical complications, including serious and fatal complications, is increased in Avastin-treated patients
  - — Discontinue in patients with wound dehiscence. Discontinue at least 28 days prior to elective surgery
  - — Do not initiate Avastin for at least 28 days after surgery and until the surgical wound is fully healed
- **Hemorrhage**
  - — Severe or fatal hemorrhage, hemoptysis, GI bleeding, CNS hemorrhage, and vaginal bleeding are increased in Avastin-treated patients. Do not administer Avastin to patients with serious hemorrhage or recent hemoptysis

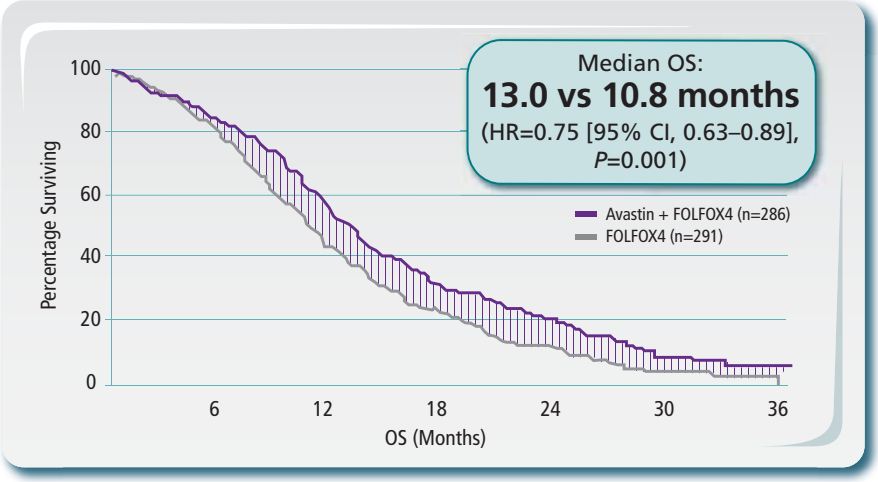
Please see accompanying full Prescribing Information, including **Boxed WARNINGS**, and page 7 for additional important safety information.

AVASTIN® bevacizumab

Avastin plus IV 5-FU–based therapy in second-line MCRC

Avastin is the only FDA-approved biologic with an OS benefit in second-line MCRC[1,2]

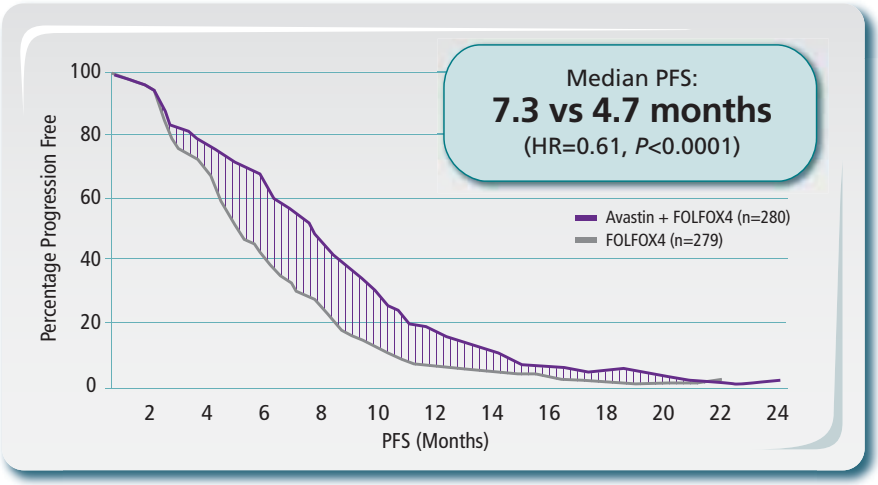
Significant increase in median OS with Avastin plus FOLFOX4 in pivotal Study E3200[1-3]



FOLFOX4=5-fluorouracil (5-FU)/leucovorin (LV)/oxaliplatin; MCRC=metastatic colorectal cancer; IV=intravenous; HR=hazard ratio; CI=confidence interval.

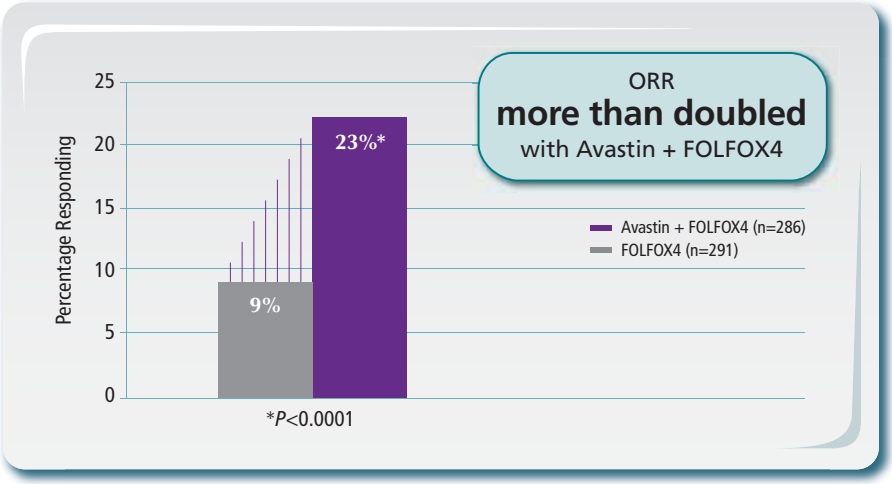
- At 1 year, 56% of Avastin-treated patients were alive vs 43% of those receiving FOLFOX4 alone[1]
- At 2 years, 22% of Avastin-treated patients were alive vs 14% of those receiving FOLFOX4 alone[3]

Significant increase in median progression-free survival (PFS) with Avastin plus FOLFOX4[1]

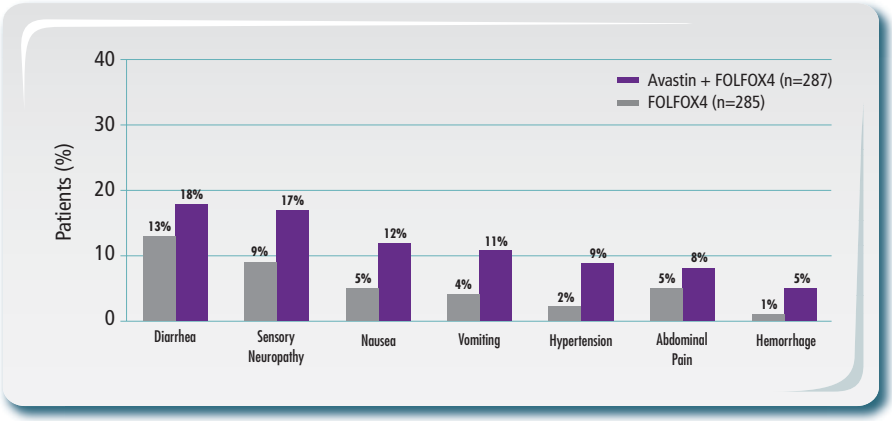


- Early separation of the PFS curves in Study E3200 reflects the significant reduction in the risk of disease progression with Avastin plus FOLFOX4[1]

Significant increase in overall response rate (ORR) with Avastin plus FOLFOX4[1]



Avastin plus FOLFOX4 (second-line MCRC)
Selected grade 3–5 adverse events (≥2% higher incidence in the Avastin arm)[2]



Additional serious adverse events

- Additional serious and sometimes fatal adverse events with increased incidence in the Avastin-treated arm vs control included
  - — Non-GI fistula formation (≤0.3%)
  - — Arterial thromboembolic events (grade ≥3, 2.4%)
  - — Proteinuria including nephrotic syndrome (<1%)
- Additional serious adverse events with increased incidence in the Avastin-treated arm vs control included
  - — Hypertension (grade 3–4, 5%–18%)
  - — Reversible posterior leukoencephalopathy syndrome (RPLS) (<0.1%)
- Infusion reactions with the first dose of Avastin were uncommon (<3%), and severe reactions occurred in 0.2% of patients
- Inform females of reproductive potential of the risk of ovarian failure prior to starting treatment with Avastin

Please see accompanying full Prescribing Information, including **Boxed WARNINGS**, and page 7 for additional important safety information.

AVASTIN® bevacizumab

Established Avastin doses in pivotal Phase III MCRC trials[2]

- Avastin is administered as a solution for IV infusion at the following doses

Chemotherapy regimen	Recommended dose	Schedule
IFL* (Study 2107)	5 mg/kg IV	q2w
FOLFOX4† (Study E3200)	10 mg/kg IV	q2w

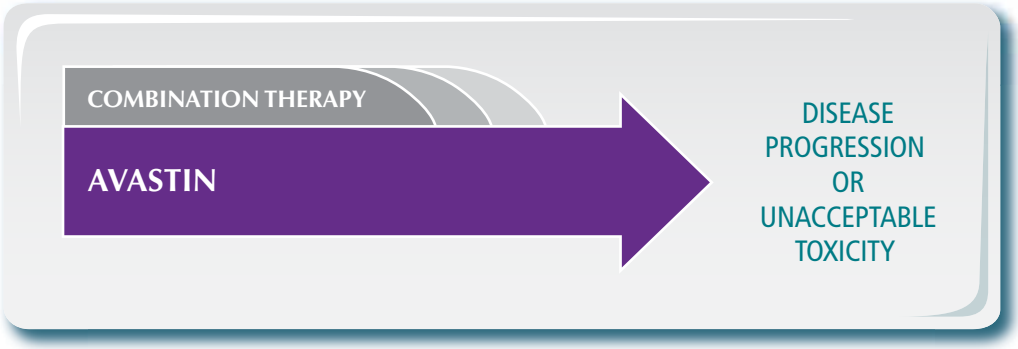
IFL=5-FU/LV/irinotecan; q2w=every 2 weeks.
*5 mg/kg IV dose evaluated in first-line MCRC in combination with IFL.
†10 mg/kg IV dose evaluated in second-line MCRC in combination with FOLFOX4.

Survival benefits were achieved with Avastin administered until disease progression or unacceptable toxicity and at the approved dose[1,2]

Duration of treatment

FDA-approved prescribing information for the duration of Avastin treatment[1]

"Patients should continue treatment until disease progression or unacceptable toxicity."



Important treatment considerations—Dose modifications

- There are no recommended dose reductions
- Discontinue Avastin in patients with
  - **— Gastrointestinal (GI) perforations (GI perforations, fistula formation in the GI tract, intra-abdominal abscess)**
  - — Fistula formation involving an internal organ
  - **— Wound dehiscence and wound healing complications requiring medical intervention**
  - **— Serious hemorrhage (ie, requiring medical intervention)**
  - — Severe arterial thromboembolic event (ATE)
  - — Hypertensive crisis or hypertensive encephalopathy
  - — Reversible posterior leukoencephalopathy syndrome (RPLS) (symptoms usually resolve or improve within days, although some patients have experienced ongoing neurologic sequelae)
  - — Nephrotic syndrome
- Temporarily suspend Avastin for at least 4 weeks prior to elective surgery, severe hypertension not controlled with medical management, moderate to severe proteinuria pending further evaluation, and severe infusion reactions
- The safety of resumption of Avastin therapy in patients that experienced RPLS, ATE, and moderate to severe proteinuria is unknown

Important treatment considerations—Women of childbearing potential

- Avastin increases the risk of ovarian failure and may impair fertility
- Inform females of reproductive potential of the risk of ovarian failure prior to starting treatment with Avastin
- Long-term effects of Avastin exposure on fertility are unknown
- Prior to initiation of therapy, advise patients of the potential risk of Avastin to the developing fetus
- Counsel patients who become pregnant about the possible risks, including hazard to the fetus and/or loss of pregnancy, of both continued treatment and prolonged exposure following discontinuation, keeping in mind the approximate half-life of Avastin (20 days; range 11–50 days). Patients should also be counseled to continue adequate contraception for at least 6 months following the last dose of Avastin
- Nursing mothers should be advised to discontinue nursing or Avastin, taking into account the half-life of the product and the importance of Avastin to the mother

Please see accompanying full Prescribing Information, including **Boxed WARNINGS**, and page 7 for additional important safety information.

AVASTIN®
bevacizumab

Genentech is committed to providing practices and eligible patients with reimbursement and coverage support

AVASTIN® bevacizumab Access Solutions®

Coverage and Reimbursement

- Help with benefits and coverage issues
  - — Benefits investigation
  - — Prior authorization
  - — Recertification
- Help with reimbursement issues
  - — Denials and appeals
  - — Billing and coding information

Patient Assistance

- Genentech® Access to Care Foundation (GATCF) support for qualifying uninsured and rendered uninsured patients
- Referrals to independent, non-profit organizations for co-pay assistance
- Genentech BioOncology Co-pay Card
- Avastin Patient Assistance Program
- Cancer*Care*

Informational Resources

- My Patient Solutions, our online patient management tool
- Communication assistance services
  - — Translation services
  - — Telephone to telephone typewriter (TTY) services
- Product spoilage and replacement information
- Medicare/Medicaid search tool
- Glossary of access and reimbursement terms

To speak live with one of our specialists, call **(888) 249-4918** from 6 AM to 5 PM PT, Monday to Friday, or visit **AvastinAccessSolutions.com**

Boxed WARNINGS

- **Gastrointestinal (GI) perforation**
  - Serious and sometimes fatal GI perforation occurs at a higher incidence in Avastin-treated patients compared to controls
  - The incidences of GI perforation ranged from 0.3% to 2.4% across clinical studies
  - Discontinue Avastin in patients with GI perforation
- **Surgery and wound healing complications**
  - The incidence of wound healing and surgical complications, including serious and fatal complications, is increased in Avastin-treated patients
  - Do not initiate Avastin for at least 28 days after surgery and until the surgical wound is fully healed. The appropriate interval between termination of Avastin and subsequent elective surgery required to reduce the risks of impaired wound healing/wound dehiscence has not been determined
  - Discontinue Avastin at least 28 days prior to elective surgery and in patients with wound healing complications requiring medical intervention
- **Hemorrhage**
  - Severe or fatal hemorrhage, including hemoptysis, GI bleeding, hematemesis, central nervous system hemorrhage, epistaxis, and vaginal bleeding, occurred up to 5-fold more frequently in patients receiving Avastin. Across indications, the incidence of grade ≥3 hemorrhagic events among patients receiving Avastin ranged from 1.2% to 4.6%
  - Do not administer Avastin to patients with serious hemorrhage or recent hemoptysis (≥1/2 tsp of red blood)
  - Discontinue Avastin in patients with serious hemorrhage (ie, requiring medical intervention)

Additional serious adverse events

- Additional serious and sometimes fatal adverse events with increased incidence in the Avastin-treated arm vs control included
  - Non-GI fistula formation (≤0.3%)
  - Arterial thromboembolic events (grade ≥3, 2.4%)
  - Proteinuria including nephrotic syndrome (<1%)
- Additional serious adverse events with increased incidence in the Avastin-treated arm vs control included
  - Hypertension (grade 3–4, 5%–18%)
  - Reversible posterior leukoencephalopathy syndrome (RPLS) (<0.1%)
- Infusion reactions with the first dose of Avastin were uncommon (<3%), and severe reactions occurred in 0.2% of patients
- Inform females of reproductive potential of the risk of ovarian failure prior to starting treatment with Avastin

Most common adverse events

- Most common adverse reactions observed in Avastin patients at a rate >10% and at least twice the control arm rate were
  - Epistaxis
  - Headache
  - Hypertension
  - Rhinitis
  - Proteinuria
  - Taste alteration
  - Dry skin
  - Rectal hemorrhage
  - Lacrimation disorder
  - Back pain
  - Exfoliative dermatitis
- Across all studies, Avastin was discontinued in 8.4% to 21% of patients because of adverse reactions

Pregnancy warning

- Avastin may impair fertility
- Based on animal data, Avastin may cause fetal harm
- Advise patients of the potential risk to the fetus during and following Avastin and the need to continue adequate contraception for at least 6 months following the last dose of Avastin
- For nursing mothers, discontinue nursing or Avastin, taking into account the importance of Avastin to the mother

Please see accompanying full Prescribing Information, including **Boxed WARNINGS**, for additional important safety information.

AVASTIN® bevacizumab

Avastin: Experience that matters

- Avastin is the only biologic to demonstrate an OS benefit in combination with FOLFOX4 (Study E3200)[1]
- Avastin is the only FDA-approved biologic with an OS benefit in second-line MCRC[1,2]
- OS benefits were achieved with Avastin administered until disease progression or unacceptable toxicity[1,2]

Boxed WARNINGS

- **Gastrointestinal (GI) perforation**
  - — Serious and sometimes fatal GI perforation occurs at a higher incidence (up to 2.4%) in Avastin-treated patients compared to controls. Discontinue Avastin for GI perforation
- **Surgery and wound healing complications**
  - — The incidence of wound healing and surgical complications, including serious and fatal complications, is increased in Avastin-treated patients
  - — Discontinue in patients with wound dehiscence. Discontinue at least 28 days prior to elective surgery
  - — Do not initiate Avastin for at least 28 days after surgery and until the surgical wound is fully healed
- **Hemorrhage**
  - — Severe or fatal hemorrhage, hemoptysis, GI bleeding, CNS hemorrhage, and vaginal bleeding are increased in Avastin-treated patients. Do not administer Avastin to patients with serious hemorrhage or recent hemoptysis

Please see accompanying full Prescribing Information, including **Boxed WARNINGS,** and page 7 for additional important safety information.

References: 1. Giantonio BJ, Catalano PJ, Meropol NJ, et al. *J Clin Oncol*. 2007;25:1539-1544. **2.** Avastin Prescribing Information. Genentech, Inc. September 2011. **3.** Data on file. Genentech, Inc. **4.** Hurwitz H, Fehrenbacher L, Novotny W, et al. *N Engl J Med*. 2004;350:2335-2342.

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AVASTIN® bevacizumab

HIGHLIGHTS OF PRESCRIBING INFORMATION

These highlights do not include all the information needed to use AVASTIN safely and effectively. See full prescribing information for AVASTIN.

AVASTIN® (bevacizumab)
Solution for intravenous infusion
Initial U.S. Approval: 2004

WARNING: GASTROINTESTINAL PERFORATIONS, SURGERY AND WOUND HEALING COMPLICATIONS, and HEMORRHAGE

See full prescribing information for complete boxed warning.

- **Gastrointestinal Perforation: Occurs in up to 2.4% of Avastin-treated patients. Discontinue Avastin for gastrointestinal perforation. (5.1)**
- **Surgery and Wound Healing Complications: Discontinue in patients with wound dehiscence. Discontinue at least 28 days prior to elective surgery. Do not initiate Avastin for at least 28 days after surgery and until the surgical wound is fully healed. (5.2)**
- **Hemorrhage: Severe or fatal hemorrhage, hemoptysis, gastrointestinal bleeding, CNS hemorrhage, and vaginal bleeding are increased in Avastin- treated patients. Do not administer Avastin to patients with serious hemorrhage or recent hemoptysis. (5.3)**

----------RECENT MAJOR CHANGES----------

Warnings and Precautions: Ovarian Failure (5.10) 09/2011

----------INDICATIONS AND USAGE----------

Avastin is a vascular endothelial growth factor-specific angiogenesis inhibitor indicated for the treatment of:

- Metastatic colorectal cancer, with intravenous 5-fluorouracil–based chemotherapy for first- or second-line treatment. (1.1)
- Non-squamous non-small cell lung cancer, with carboplatin and paclitaxel for first line treatment of unresectable, locally advanced, recurrent or metastatic disease. (1.2)
- Metastatic breast cancer, with paclitaxel for treatment of patients who have not received chemotherapy for metastatic HER2-negative breast cancer. (1.3)
  -Effectiveness based on improvement in progression-free survival. No data available demonstrating improvement in disease-related symptoms or survival with Avastin.
  -Not indicated for disease progression following anthracycline and taxane chemotherapy administered for metastatic disease.
- Glioblastoma, as a single agent for adult patients with progressive disease following prior therapy. (1.4)
  -Effectiveness based on improvement in objective response rate. No data available demonstrating improvement in disease-related symptoms or survival with Avastin.
- Metastatic renal cell carcinoma with interferon alfa (1.5)

----------DOSAGE AND ADMINISTRATION----------

- Do not administer as an IV push or bolus. (2.1)
- Do not initiate Avastin for 28 days following major surgery and until surgical wound is fully healed. (2.1)

Metastatic colorectal cancer (2.2)
- 5 mg/kg IV every 2 weeks with bolus-IFL
- 10 mg/kg IV every 2 weeks with FOLFOX4

Non–squamous non–small cell lung cancer (2.2)
- 15 mg/kg IV every 3 weeks with carboplatin/paclitaxel

Metastatic breast cancer (2.2)
- 10 mg/kg IV every 2 weeks with paclitaxel

Glioblastoma (2.2)
- 10 mg/kg IV every 2 weeks

Metastatic renal cell carcinoma (mRCC) (2.2)
- 10 mg/kg IV every 2 weeks with interferon alfa

----------DOSAGE FORMS AND STRENGTHS----------

- 100 mg/4 mL, single use vial (3)
- 400 mg/16 mL, single use vial (3)

----------CONTRAINDICATIONS----------

None (4)

----------WARNINGS AND PRECAUTIONS----------

- Non-Gastrointestinal Fistula Formation: Discontinue Avastin if fistula formation occurs. (5.4)
- Arterial Thromboembolic Events (e.g., myocardial infarction, cerebral infarction): Discontinue Avastin for severe ATE. (5.5)
- Hypertension: Monitor blood pressure and treat hypertension. Temporarily suspend Avastin if not medically controlled. Discontinue Avastin for hypertensive crisis or hypertensive encephalopathy. (5.6)
- Reversible Posterior Leukoencephalopathy Syndrome (RPLS): Discontinue Avastin. (5.7)
- Proteinuria: Monitor urine protein. Discontinue for nephrotic syndrome. Temporarily suspend Avastin for moderate proteinuria. (5.8)
- Infusion Reactions: Stop for severe infusion reactions. (5.9)
- Ovarian Failure: Inform females of reproductive potential of the risk of ovarian failure with Avastin (5.10)

----------ADVERSE REACTIONS----------

Most common adverse reactions incidence (>10% and at least twice the control arm rate) are epistaxis, headache, hypertension, rhinitis, proteinuria, taste alteration, dry skin, rectal hemorrhage, lacrimation disorder, back pain and exfoliative dermatitis. (6.1)

To report SUSPECTED ADVERSE REACTIONS, contact Genentech, Inc. at 1-888-835-2555 or FDA at 1-800-FDA-1088 or www.fda.gov/medwatch.

----------USE IN SPECIFIC POPULATIONS----------

- Pregnancy: Based on animal data, may cause fetal harm. (8.1)
- Nursing Mothers: Discontinue nursing or discontinue drug. (8.3)

See 17 for PATIENT COUNSELING INFORMATION.

Revised:September 2011

FULL PRESCRIBING INFORMATION: CONTENTS*

* Sections or subsections omitted from the Full Prescribing Information are not listed.

FULL PRESCRIBING INFORMATION

WARNING: GASTROINTESTINAL PERFORATIONS, SURGERY AND WOUND HEALING COMPLICATIONS, and HEMORRHAGE

Gastrointestinal Perforations

The incidence of gastrointestinal perforation, some fatal, in Avastin-treated patients ranges from 0.3 to 2.4%. Discontinue Avastin in patients with gastrointestinal perforation. [See *Dosage and Administration (2.4), Warnings and Precautions (5.1)*.]

Surgery and Wound Healing Complications

The incidence of wound healing and surgical complications, including serious and fatal complications, is increased in Avastin-treated patients. Discontinue Avastin in patients with wound dehiscence. The appropriate interval between termination of Avastin and subsequent elective surgery required to reduce the risks of impaired wound healing/wound dehiscence has not been determined. Discontinue at least 28 days prior to elective surgery. Do not initiate Avastin for at least 28 days after surgery and until the surgical wound is fully healed. [See *Dosage and Administration (2.4), Warnings and Precautions (5.2), Adverse Reactions (6.1)*.]

Hemorrhage

Severe or fatal hemorrhage, including hemoptysis, gastrointestinal bleeding, central nervous systems (CNS) hemorrhage, epistaxis, and vaginal bleeding occurred up to five-fold more frequently in patients receiving Avastin. Do not administer Avastin to patients with serious hemorrhage or recent hemoptysis. [See *Dosage and Administration (2.4), Warnings and Precautions (5.3), Adverse Reactions (6.1)*.]

1 INDICATIONS AND USAGE

1.1 Metastatic Colorectal Cancer (mCRC)

Avastin is indicated for the first- or second-line treatment of patients with metastatic carcinoma of the colon or rectum in combination with intravenous 5-fluorouracil–based chemotherapy.

1.2 Non-Squamous Non–Small Cell Lung Cancer (NSCLC)

Avastin is indicated for the first-line treatment of unresectable, locally advanced, recurrent or metastatic non–squamous non–small cell lung cancer in combination with carboplatin and paclitaxel.

1.3 Metastatic Breast Cancer (MBC)

Avastin is indicated for the treatment of patients who have not received chemotherapy for metastatic HER2-negative breast cancer in combination with paclitaxel.

The effectiveness of Avastin in MBC is based on an improvement in progression free survival. There are no data demonstrating an improvement in disease-related symptoms or increased survival with Avastin. [See *Clinical Studies (14.3)*.]

Avastin is not indicated for patients with breast cancer that has progressed following anthracycline and taxane chemotherapy administered for metastatic disease.

1.4 Glioblastoma

Avastin is indicated for the treatment of glioblastoma with progressive disease in adult patients following prior therapy as a single agent.

The effectiveness of Avastin in glioblastoma is based on an improvement in objective response rate. There are no data demonstrating an improvement in disease-related symptoms or increased survival with Avastin. [See *Clinical Studies (14.4)*.]

1.5 Metastatic Renal Cell Carcinoma (mRCC)

Avastin is indicated for the treatment of metastatic renal cell carcinoma in combination with interferon alfa.

2 DOSAGE AND ADMINISTRATION

2.1 Administration

Do not administer as an intravenous push or bolus. Administer only as an intravenous (IV) infusion.

- Do not initiate Avastin until at least 28 days following major surgery. Administer Avastin after the surgical incision has fully healed.
- First infusion: Administer infusion over 90 minutes.
- Subsequent infusions: Administer second infusion over 60 minutes if first infusion is tolerated; administer all subsequent infusions over 30 minutes if infusion over 60 minutes is tolerated.

2.2 Recommended Doses and Schedules

Patients should continue treatment until disease progression or unacceptable toxicity.

Metastatic Colorectal Cancer (mCRC)

The recommended doses are 5 mg/kg or 10 mg/kg every 2 weeks when used in combination with intravenous 5-FU-based chemotherapy.

- Administer 5 mg/kg when used in combination with bolus-IFL.
- Administer 10 mg/kg when used in combination with FOLFOX4.

Non-Squamous Non-Small Cell Lung Cancer (NSCLC)

The recommended dose is 15 mg/kg every 3 weeks in combination with carboplatin and paclitaxel.

Metastatic Breast Cancer (MBC)

The recommended dose is 10 mg/kg every 2 weeks in combination with paclitaxel.

Glioblastoma

The recommended dose is 10 mg/kg every 2 weeks.

Metastatic Renal Cell Carcinoma (mRCC)

The recommended dose is 10 mg/kg every 2 weeks in combination with interferon alfa.

2.3 Preparation for Administration

Use appropriate aseptic technique. Parenteral drug products should be inspected visually for particulate matter and discoloration prior to administration, whenever solution and container permit. Withdraw necessary amount of Avastin and dilute in a total volume of 100 mL of 0.9% Sodium Chloride Injection, USP. Discard any unused portion left in a vial, as the product contains no preservatives.

DO NOT ADMINISTER OR MIX WITH DEXTROSE SOLUTION.

2.4 Dose Modifications

There are no recommended dose reductions.

Discontinue Avastin for:

- Gastrointestinal perforations (gastrointestinal perforations, fistula formation in the gastrointestinal tract, intra-abdominal abscess), fistula formation involving an internal organ [See *Boxed Warning, Warnings and Precautions (5.1, 5.4)*.]
- Wound dehiscence and wound healing complications requiring medical intervention [See *Warnings and Precautions (5.2)*.]
- Serious hemorrhage (i.e., requiring medical intervention*)* [See *Boxed Warning, Warnings and Precautions (5.3)*.]
- Severe arterial thromboembolic events [See *Warnings and Precautions (5.5)*.]
- Hypertensive crisis or hypertensive encephalopathy [See *Warnings and Precautions (5.6)*.]
- Reversible posterior leukoencephalopathy syndrome (RPLS) [See *Warnings and Precautions (5.7)*.]
- Nephrotic syndrome [See *Warnings and Precautions (5.8)*.]

Temporarily suspend Avastin for:

- At least 4 weeks prior to elective surgery [See *Warnings and Precautions (5.2)*.]
- Severe hypertension not controlled with medical management [See *Warnings and Precautions (5.6)*.]
- Moderate to severe proteinuria pending further evaluation [See *Warnings and Precautions (5.8)*.]
- Severe infusion reactions [See *Warnings and Precautions (5.9)*.]

3 DOSAGE FORMS AND STRENGTHS

100 mg per 4 mL single-use vial
400 mg per 16 mL single-use vial

4 CONTRAINDICATIONS

None.

5 WARNINGS AND PRECAUTIONS

5.1 Gastrointestinal Perforations

Serious and sometimes fatal gastrointestinal perforation occurs at a higher incidence in Avastin treated patients compared to controls. The incidence of gastrointestinal perforation ranged from 0.3 to 2.4% across clinical studies. [See *Adverse Reactions (6.1)*.]

The typical presentation may include abdominal pain, nausea, emesis, constipation, and fever. Perforation can be complicated by intra-abdominal abscess and fistula formation. The majority of cases occurred within the first 50 days of initiation of Avastin.

Discontinue Avastin in patients with gastrointestinal perforation. [See *Boxed Warning, Dosage and Administration (2.4)*.]

5.2 Surgery and Wound Healing Complications

Avastin impairs wound healing in animal models. [See *Nonclinical Toxicology (13.2)*.] In clinical trials, administration of Avastin was not allowed until at least 28 days after surgery. In a controlled clinical trial, the incidence of wound healing complications, including serious and fatal complications, in patients with mCRC who underwent surgery during the course of Avastin treatment was 15% and in patients who did not receive Avastin, was 4%. [See *Adverse Reactions (6.1)*.]

Avastin should not be initiated for at least 28 days following surgery and until the surgical wound is fully healed. Discontinue Avastin in patients with wound healing complications requiring medical intervention.

The appropriate interval between the last dose of Avastin and elective surgery is unknown; however, the half-life of Avastin is estimated to be 20 days. Suspend Avastin for at least 28 days prior to elective surgery. Do not administer Avastin until the wound is fully healed. [See *Boxed Warning, Dosage and Administration (2.4)*.]

5.3 Hemorrhage

Avastin can result in two distinct patterns of bleeding: minor hemorrhage, most commonly Grade 1 epistaxis; and serious, and in some cases fatal, hemorrhagic events. Severe or fatal hemorrhage, including hemoptysis, gastrointestinal bleeding, hematemesis, CNS hemorrhage, epistaxis, and vaginal bleeding occurred up to five-fold more frequently in patients receiving Avastin compared to patients receiving only chemotherapy. Across indications, the incidence of Grade ≥ 3 hemorrhagic events among patients receiving Avastin ranged from 1.2 to 4.6%. [See *Adverse Reactions (6.1)*.]

Serious or fatal pulmonary hemorrhage occurred in four of 13 (31%) patients with squamous cell histology and two of 53 (4%) patients with non-squamous non-small cell lung cancer receiving Avastin and chemotherapy compared to none of the 32 (0%) patients receiving chemotherapy alone.

In clinical studies in non–small cell lung cancer where patients with CNS metastases who completed radiation and surgery more than 4 weeks prior to the start of Avastin were evaluated with serial CNS imaging, symptomatic Grade 2 CNS hemorrhage was documented in one of 83 Avastin-treated patients (rate 1.2%, 95% CI 0.06%–5.93%).

Intracranial hemorrhage occurred in 8 of 163 patients with previously treated glioblastoma; two patients had Grade 3–4 hemorrhage.

Do not administer Avastin to patients with recent history of hemoptysis of ≥1/2 teaspoon of red blood. Discontinue Avastin in patients with hemorrhage. [See *Boxed Warning, Dosage and Administration (2.4)*.]

5.4 Non-Gastrointestinal Fistula Formation

Serious and sometimes fatal non-gastrointestinal fistula formation involving tracheo-esophageal, bronchopleural, biliary, vaginal, renal and bladder sites occurs at a higher incidence in Avastin-treated patients compared to controls. The incidence of non-gastrointestinal perforation was ≤0.3% in clinical studies. Most events occurred within the first 6 months of Avastin therapy.

Discontinue Avastin in patients with fistula formation involving an internal organ. [See *Dosage and Administration (2.4)*.]

5.5 Arterial Thromboembolic Events

Serious, sometimes fatal, arterial thromboembolic events (ATE) including cerebral infarction, transient ischemic attacks, myocardial infarction, angina, and a variety of other ATE occurred at a higher incidence in patients receiving Avastin compared to those in the control arm. Across indications, the incidence of Grade ≥ 3 ATE in the Avastin containing arms was 2.4% compared to 0.7% in the control arms. Among patients receiving Avastin in combination with chemotherapy, the risk of developing ATE during therapy was increased in patients with a history of arterial thromboembolism, or age greater than 65 years. [See *Use in Specific Populations (8.5)*.]

The safety of resumption of Avastin therapy after resolution of an ATE has not been studied. Discontinue Avastin in patients who experience a severe ATE. [See *Dosage and Administration (2.4)*.]

5.6 Hypertension

The incidence of severe hypertension is increased in patients receiving Avastin as compared to controls. Across clinical studies the incidence of Grade 3 or 4 hypertension ranged from 5-18%.

Monitor blood pressure every two to three weeks during treatment with Avastin. Treat with appropriate anti-hypertensive therapy and monitor blood pressure regularly. Continue to monitor blood pressure at regular intervals in patients with Avastin-induced or -exacerbated hypertension after discontinuation of Avastin.

Temporarily suspend Avastin in patients with severe hypertension that is not controlled with medical management. Discontinue Avastin in patients with hypertensive crisis or hypertensive encephalopathy. [See *Dosage and Administration (2.4)*.]

5.7 Reversible Posterior Leukoencephalopathy Syndrome (RPLS)

RPLS has been reported with an incidence of <0.1% in clinical studies. The onset of symptoms occurred from 16 hours to 1 year after initiation of Avastin. RPLS is a neurological disorder which can present with headache, seizure, lethargy, confusion, blindness and other visual and neurologic disturbances. Mild to severe hypertension may be present. Magnetic resonance imaging (MRI) is necessary to confirm the diagnosis of RPLS.

Discontinue Avastin in patients developing RPLS. Symptoms usually resolve or improve within days, although some patients have experienced ongoing neurologic sequelae. The safety of reinitiating Avastin therapy in patients previously experiencing RPLS is not known. [See *Dosage and Administration (2.4)*.]

5.8 Proteinuria

The incidence and severity of proteinuria is increased in patients receiving Avastin as compared to controls. Nephrotic syndrome occurred in < 1% of patients receiving Avastin in clinical trials, in some instances with fatal outcome. [See *Adverse Reactions (6.1)*.] In a published case series, kidney biopsy of six patients with proteinuria showed findings consistent with thrombotic microangiopathy.

Monitor proteinuria by dipstick urine analysis for the development or worsening of proteinuria with serial urinalyses during Avastin therapy. Patients with a 2+ or greater urine dipstick reading should undergo further assessment with a 24-hour urine collection.

Suspend Avastin administration for ≥ 2 grams of proteinuria/24 hours and resume when proteinuria is < 2 gm/24 hours. Discontinue Avastin in patients with nephrotic syndrome. Data from a postmarketing safety study showed poor correlation between UPCR (Urine Protein/Creatinine Ratio) and 24 hour urine protein (Pearson Correlation 0.39 (95% CI 0.17, 0.57). [See *Use in Specific Populations (8.5)*.] The safety of continued Avastin treatment in patients with moderate to severe proteinuria has not been evaluated. [See *Dosage and Administration (2.4)*.]

5.9 Infusion Reactions

Infusion reactions reported in the clinical trials and post-marketing experience include hypertension, hypertensive crises associated with neurologic signs and symptoms, wheezing, oxygen desaturation, Grade 3 hypersensitivity, chest pain, headaches, rigors, and diaphoresis. In clinical studies, infusion reactions with the first dose of Avastin were uncommon (< 3%) and severe reactions occurred in 0.2% of patients.

Stop infusion if a severe infusion reaction occurs and administer appropriate medical therapy. [See *Dosage and Administration (2.4)*.]

5.10 Ovarian Failure

The incidence of ovarian failure was higher (34% vs. 2%) in premenopausal women receiving Avastin in combination with mFOLFOX chemotherapy as compared to those receiving mFOLFOX chemotherapy alone for adjuvant treatment for colorectal cancer, a use for which Avastin is not approved. Inform females of reproductive potential of the risk of ovarian failure prior to starting treatment with Avastin. [See *Adverse Reactions (6.1), Use in Specific Populations (8.6)*.]

6 ADVERSE REACTIONS

The following serious adverse reactions are discussed in greater detail in other sections of the label:

- Gastrointestinal Perforations [See *Boxed Warning, Dosage and Administration (2.4), Warnings and Precautions (5.1)*.]
- Surgery and Wound Healing Complications [See *Boxed Warning, Dosage and Administration (2.4), Warnings and Precautions (5.2)*.]
- Hemorrhage [See *Boxed Warning, Dosage and Administration (2.4), Warnings and Precautions (5.3)*.]
- Non-Gastrointestinal Fistula Formation [See *Dosage and Administration (2.4), Warnings and Precautions (5.4)*.]
- Arterial Thromboembolic Events [See *Dosage and Administration (2.4), Warnings and Precautions (5.5)*.]
- Hypertensive Crisis [See *Dosage and Administration (2.4), Warnings and Precautions (5.6)*.]
- Reversible Posterior Leukoencephalopathy Syndrome [See *Dosage and Administration (2.4), Warnings and Precautions (5.7)*.]
- Proteinuria [See *Dosage and Administration (2.4), Warnings and Precautions (5.8)*.]
- Ovarian Failure [See *Warnings and Precautions (5.10), Use in Specific Populations (8.6)*.]

The most common adverse reactions observed in Avastin patients at a rate > 10% and at least twice the control arm rate, are epistaxis, headache, hypertension, rhinitis, proteinuria, taste alteration, dry skin, rectal hemorrhage, lacrimation disorder, back pain and exfoliative dermatitis.

Across all studies, Avastin was discontinued in 8.4 to 21% of patients because of adverse reactions.

6.1 Clinical Trial Experience

Because clinical trials are conducted under widely varying conditions, adverse reaction rates observed in the clinical trials of a drug cannot be directly compared to rates in the clinical trials of another drug and may not reflect the rates observed in practice.

The data below reflect exposure to Avastin in 4024 patients with CRC, non-squamous NSCLC, MBC, glioblastoma, or mRCC trials including controlled (Studies 1, 2, 4, 5, 6 and 9) or uncontrolled, single arm (Study 7) treated at the recommended dose and schedule for a median of 8 to 23 doses of Avastin. [See *Clinical Studies (14)*.] The population was aged 18-88 years (median 59), 41% male and 85.1% white. The population included 1783 first- and second-line mCRC patients who received a median of 10 doses of Avastin, 669 female adjuvant CRC patients who received a median of 23 doses of Avastin, 480 first-line metastatic NSCLC patients who received a median of 8 doses of Avastin, 592 MBC patients who had not received chemotherapy for metastatic disease received a median of 8 doses of Avastin, 163 glioblastoma patients who received a median of 9 doses of Avastin, and 337 mRCC patients who received a median of 16 doses of Avastin.

Surgery and Wound Healing Complications

The incidence of post-operative wound healing and/or bleeding complications was increased in patients with mCRC receiving Avastin as compared to patients receiving only chemotherapy. Among patients requiring surgery on or within 60 days of receiving study treatment, wound healing and/or bleeding complications occurred in 15% (6/39) of patients receiving bolus-IFL plus Avastin as compared to 4% (1/25) of patients who received bolus-IFL alone.

In Study 7, events of post-operative wound healing complications (craniotomy site wound dehiscence and cerebrospinal fluid leak) occurred in patients with previously treated glioblastoma: 3/84 patients in the Avastin alone arm and 1/79 patients in the Avastin plus irinotecan arm. [See *Boxed Warning, Dosage and Administration (2.4), Warnings and Precautions (5.2)*.]

Hemorrhage

The incidence of epistaxis was higher (35% vs. 10%) in patients with mCRC receiving bolus-IFL plus Avastin compared with patients receiving bolus-IFL plus placebo. All but one of these events were Grade 1 in severity and resolved without medical intervention. Grade 1 or 2 hemorrhagic events were more frequent in patients receiving bolus-IFL plus Avastin when compared to those receiving bolus-IFL plus placebo and included gastrointestinal hemorrhage (24% vs. 6%), minor gum bleeding (2% vs. 0), and vaginal hemorrhage (4% vs. 2%). [See *Boxed Warning, Dosage and Administration (2.4), Warnings and Precautions (5.3)*.]

Venous Thromboembolic Events

The overall incidence of Grade 3–4 venous thromboembolic events in Study 1 was 15.1% in patients receiving bolus-IFL plus Avastin and 13.6% in patients receiving bolus-IFL plus placebo. In Study 1, more patients in the Avastin containing arm experienced deep venous thrombosis (34 vs. 19 patients) and intra-abdominal venous thrombosis (10 vs. 5 patients).

The risk of developing a second thromboembolic event while on Avastin and oral anticoagulants was evaluated in two randomized studies. In Study 1, 53 patients (14%) on the bolus-IFL plus Avastin arm and 30 patients (8%) on the bolus-IFL plus placebo arm received full dose warfarin following a venous thromboembolic event (VTE). Among these patients, an additional thromboembolic event occurred in 21% (11/53) of patients receiving bolus-IFL plus Avastin and 3% (1/30) of patients receiving bolus-IFL alone.

In a second, randomized, 4-arm study in 1401 patients with mCRC, prospectively evaluating the incidence of VTE (all grades), the overall incidence of first VTE was higher in the Avastin containing arms (13.5%) than the chemotherapy alone arms (9.6%). Among the 116 patients treated with anticoagulants following an initial VTE event (73 in the Avastin plus chemotherapy arms and

43 in the chemotherapy alone arms), the overall incidence of subsequent VTEs was also higher among the Avastin treated patients (31.5% vs. 25.6%). In this subgroup of patients treated with anticoagulants, the overall incidence of bleeding, the majority of which were Grade 1, was higher in the Avastin treated arms than the chemotherapy arms (27.4% vs. 20.9%). [See *Dosage and Administration (2.4)*.]

Neutropenia and Infection

The incidences of neutropenia and febrile neutropenia are increased in patients receiving Avastin plus chemotherapy compared to chemotherapy alone. In Study 1, the incidence of Grade 3 or 4 neutropenia was increased in mCRC patients receiving IFL plus Avastin (21%) compared to patients receiving IFL alone (14%). In Study 4, the incidence of Grade 4 neutropenia was increased in NSCLC patients receiving paclitaxel/carboplatin (PC) plus Avastin (26.2%) compared with patients receiving PC alone (17.2%). Febrile neutropenia was also increased (5.4% for PC plus Avastin vs. 1.8% for PC alone). There were 19 (4.5%) infections with Grade 3 or 4 neutropenia in the PC plus Avastin arm of which 3 were fatal compared to 9 (2%) neutropenic infections in patients receiving PC alone, of which none were fatal. During the first 6 cycles of treatment, the incidence of serious infections including pneumonia, febrile neutropenia, catheter infections and wound infections was increased in the PC plus Avastin arm [58 patients (13.6%)] compared to the PC alone arm [29 patients (6.6%)].

In Study 7, one fatal event of neutropenic infection occurred in a patient with previously treated glioblastoma receiving Avastin alone. The incidence of any grade of infection in patients receiving Avastin alone was 55% and the incidence of Grade 3-5 infection was 10%.

Proteinuria

Grade 3-4 proteinuria ranged from 0.7 to 7.4% in Studies 1, 2, 4 and 9. The overall incidence of proteinuria (all grades) was only adequately assessed in Study 9, in which the incidence was 20%. Median onset of proteinuria was 5.6 months (range 15 days to 37 months) after initiation of Avastin. Median time to resolution was 6.1 months (95% CI 2.8 months, 11.3 months). Proteinuria did not resolve in 40% of patients after median follow up of 11.2 months and required permanent discontinuation of Avastin in 30% of the patients who developed proteinuria (Study 9). [See *Warnings and Precautions (5.8)*.]

Congestive Heart Failure

The incidence of Grade ≥ 3 left ventricular dysfunction was 1.0% in patients receiving Avastin compared to 0.6% in the control arm across indications. In patients with MBC, the incidence of Grade 3-4 congestive heart failure (CHF) was increased in patients in the Avastin plus paclitaxel arm (2.2%) as compared to the control arm (0.3%). Among patients receiving prior anthracyclines for MBC, the rate of CHF was 3.8% for patients receiving Avastin as compared to 0.6% for patients receiving paclitaxel alone. The safety of continuation or resumption of Avastin in patients with cardiac dysfunction has not been studied.

Ovarian Failure

The incidence of new cases of ovarian failure (defined as amenorrhoea lasting 3 or more months, FSH level ≥30 mIU/mL and a negative serum β-HCG pregnancy test)was prospectively evaluated in a subset of 179 women receiving mFOLFOX chemotherapy alone (n=84 or with Avastin (n=95). New cases of ovarian failure were identified in 34% (32/95) of women receiving Avastin in combination with chemotherapy compared with 2% (2/84) of women receiving chemotherapy alone [relative risk of 14 (95% CI 4, 53)]. After discontinuation of Avastin treatment, recovery of ovarian function at all time points during the post-treatment period was demonstrated in 22% (7/32) of the Avastin-treated women. Recovery of ovarian function is defined as resumption of menses, a positive serum β -HCG pregnancy test, or a FSH level < 30 mIU/mL during the post-treatment period. Long term effects of Avastin exposure on fertility are unknown. [See *Warnings and Precautions (5.10), Use in Specific Populations (8.6)*.]

Metastatic Colorectal Cancer (mCRC)

The data in Table 1 and Table 2 were obtained in Study 1, a randomized, double-blind, controlled trial comparing chemotherapy plus Avastin with chemotherapy plus placebo. Avastin was administered at 5 mg/kg every 2 weeks.

All Grade 3–4 adverse events and selected Grade 1–2 adverse events (hypertension, proteinuria, thromboembolic events) were collected in the entire study population. Severe and life-threatening (Grade 3–4) adverse events, which occurred at a higher incidence (≥ 2%) in patients receiving bolus-IFL plus Avastin as compared to bolus-IFL plus placebo, are presented in Table 1.

Table 1

NCI-CTC Grade 3–4 Adverse Events in Study 1
(Occurring at Higher Incidence [≥ 2%] Avastin vs. Control)

	Arm 1 IFL + Placebo (n=396)	Arm 2 IFL + Avastin (n=392)
NCI-CTC Grade 3-4 Events	74%	87%
Body as a Whole		
Asthenia	7%	10%
Abdominal Pain	5%	8%
Pain	5%	8%
Cardiovascular		
Hypertension	2%	12%
Deep Vein Thrombosis	5%	9%
Intra-Abdominal Thrombosis	1%	3%
Syncope	1%	3%
Digestive		
Diarrhea	25%	34%
Constipation	2%	4%
Hemic/Lymphatic		
Leukopenia	31%	37%
Neutropenia[a]	14%	21%

[a] Central laboratories were collected on Days 1 and 21 of each cycle. Neutrophil counts are available in 303 patients in Arm 1 and 276 in Arm 2.

Grade 1–4 adverse events which occurred at a higher incidence (≥ 5%) in patients receiving bolus-IFL plus Avastin as compared to the bolus-IFL plus placebo arm are presented in Table 2. Grade 1–4 adverse events were collected for the first approximately 100 patients in each of the three treatment arms who were enrolled until enrollment in Arm 3 (5-FU/LV + Avastin) was discontinued.

Table 2
NCI-CTC Grade 1-4 Adverse Events in Study 1
(Occurring at Higher Incidence [≥5%] in IFL+Avastin vs. IFL)

	Arm 1 IFL+Placebo (n=98)	Arm 2 IFL+Avastin (n=102)	Arm 3 5-FU/LV+Avastin (n=109)
Body as a Whole			
Pain	55%	61%	62%
Abdominal Pain	55%	61%	50%
Headache	19%	26%	26%
Cardiovascular			
Hypertension	14%	23%	34%
Hypotension	7%	15%	7%
Deep Vein Thrombosis	3%	9%	6%
Digestive			
Vomiting	47%	52%	47%
Anorexia	30%	43%	35%
Constipation	29%	40%	29%
Stomatitis	18%	32%	30%
Dyspepsia	15%	24%	17%
GI Hemorrhage	6%	24%	19%
Weight Loss	10%	15%	16%
Dry Mouth	2%	7%	4%
Colitis	1%	6%	1%
Hemic/Lymphatic			
Thrombocytopenia	0%	5%	5%
Nervous			
Dizziness	20%	26%	19%
Respiratory			
Upper Respiratory Infection	39%	47%	40%
Epistaxis	10%	35%	32%
Dyspnea	15%	26%	25%
Voice Alteration	2%	9%	6%
Skin/Appendages			
Alopecia	26%	32%	6%
Skin Ulcer	1%	6%	6%

Table 2 (cont'd)
NCI-CTC Grade 1-4 Adverse Events in Study 1
(Occurring at Higher Incidence [≥5%] in IFL+Avastin vs. IFL)

	Arm 1 IFL+Placebo (n=98)	Arm 2 IFL+Avastin (n=102)	Arm 3 5-FU/LV+Avastin (n=109)
Special Senses			
Taste Disorder	9%	14%	21%
Urogenital			
Proteinuria	24%	36%	36%

Avastin in Combination with FOLFOX4 in Second-line mCRC

Only Grade 3-5 non-hematologic and Grade 4–5 hematologic adverse events related to treatment were collected in Study 2. The most frequent adverse events (selected Grade 3–5 non-hematologic and Grade 4–5 hematologic adverse events) occurring at a higher incidence (≥ 2%) in 287 patients receiving FOLFOX4 plus Avastin compared to 285 patients receiving FOLFOX4 alone were fatigue (19% vs. 13%), diarrhea (18% vs. 13%), sensory neuropathy (17% vs. 9%), nausea (12% vs. 5%), vomiting (11% vs. 4%), dehydration (10% vs. 5%), hypertension (9% vs. 2%), abdominal pain (8% vs. 5%), hemorrhage (5% vs. 1%), other neurological (5% vs. 3%), ileus (4% vs. 1%) and headache (3% vs. 0%). These data are likely to under-estimate the true adverse event rates due to the reporting mechanisms used in Study 2.

Unresectable Non-Squamous Non-Small Cell Lung Cancer (NSCLC)

Only Grade 3-5 non-hematologic and Grade 4-5 hematologic adverse events were collected in Study 4. Grade 3–5 non-hematologic and Grade 4–5 hematologic adverse events (occurring at a higher incidence (≥2%) in 427 patients receiving PC plus Avastin compared with 441 patients receiving PC alone were neutropenia (27% vs. 17%), fatigue (16% vs. 13%), hypertension (8% vs. 0.7%), infection without neutropenia (7% vs. 3%), venous thrombus/embolism (5% vs. 3%), febrile neutropenia (5% vs. 2%), pneumonitis/pulmonary infiltrates (5% vs. 3%), infection with Grade 3 or 4 neutropenia (4% vs. 2%), hyponatremia (4% vs. 1%), headache (3% vs. 1%) and proteinuria (3% vs. 0%).

Metastatic Breast Cancer (MBC)

Only Grade 3–5 non-hematologic and Grade 4–5 hematologic adverse events were collected in Study 5. Grade 3–4 adverse events occurring at a higher incidence (≥2%) in 363 patients receiving paclitaxel plus Avastin compared with 348 patients receiving paclitaxel alone were sensory neuropathy (24% vs. 18%), hypertension (16% vs. 1%), fatigue (11% vs. 5%), infection without neutropenia (9% vs. 5%), neutrophils (6% vs. 3%), vomiting (6% vs. 2%), diarrhea (5% vs. 1%), bone pain (4% vs. 2%), headache (4% vs. 1%), nausea (4% vs. 1%), cerebrovascular ischemia (3% vs. 0%), dehydration (3% vs. 1%), infection with unknown ANC (3% vs. 0.3%), rash/desquamation (3% vs. 0.3%) and proteinuria (3% vs. 0%).

Sensory neuropathy, hypertension, and fatigue were reported at a ≥ 5% higher absolute incidence in the paclitaxel plus Avastin arm compared with the paclitaxel alone arm.

Fatal adverse reactions occurred in 6/363 (1.7%) of patients who received paclitaxel plus Avastin. Causes of death were gastrointestinal perforation (2), myocardial infarction (2), diarrhea/abdominal, and pain/weakness/hypotension (2).

Avastin is not approved for use in combination with capecitabine or for use in second or third line treatment of MBC. The data below are presented to provide information on the overall safety profile

of Avastin in women with breast cancer since Study 6 is the only randomized, controlled study in which all adverse events were collected for all patients. All patients in Study 6 received prior anthracycline and taxane therapy in the adjuvant setting or for metastatic disease. Grade 1–4 events which occurred at a higher incidence (≥5%) in patients receiving capecitabine plus Avastin compared to the capecitabine alone arm are presented in Table 3.

Table 3

NCI-CTC Grade 1–4 Adverse Events in Study 6 (Occurring at Higher Incidence [≥5%] in Capecitabine + Avastin vs. Capecitabine Alone)

	Capecitabine (n=215)	Capecitabine + Avastin (n=229)
Body as a Whole		
Asthenia	47%	57%
Headache	13%	33%
Pain	25%	31%
Cardiovascular		
Hypertension	2%	24%
Digestive		
Stomatitis	19%	25%
Metabolic/Nutrition		
Weight loss	4%	9%
Musculoskeletal		
Myalgia	8%	14%
Respiratory		
Dyspnea	18%	27%
Epistaxis	1%	16%
Skin/Appendages		
Exfoliative dermatitis	75%	84%
Urogenital		
Albuminuria	7%	22%

Glioblastoma

All adverse events were collected in 163 patients enrolled in Study 7 who either received Avastin alone or Avastin plus irinotecan. All patients received prior radiotherapy and temozolomide. Avastin was administered at 10 mg/kg every 2 weeks alone or in combination with irinotecan. Avastin was discontinued due to adverse events in 4.8% of patients treated with Avastin alone.

In patients receiving Avastin alone (N=84), the most frequently reported adverse events of any grade were infection (55%), fatigue (45%), headache (37%), hypertension (30%), epistaxis (19%) and diarrhea (21%). Of these, the incidence of Grade ≥3 adverse events was infection (10%), fatigue (4%), headache (4%), hypertension (8%) and diarrhea (1%). Two deaths on study were possibly related to Avastin: one retroperitoneal hemorrhage and one neutropenic infection.

In patients receiving Avastin alone or Avastin plus irinotecan (N=163), the incidence of Avastin-related adverse events (Grade 1–4) were bleeding/hemorrhage (40%), epistaxis (26%), CNS

hemorrhage (5%), hypertension (32%), venous thromboembolic event (8%), arterial thromboembolic event (6%), wound-healing complications (6%), proteinuria (4%), gastrointestinal perforation (2%), and RPLS (1%). The incidence of Grade 3–5 events in these 163 patients were bleeding/hemorrhage (2%), CNS hemorrhage (1%), hypertension (5%), venous thromboembolic event (7%), arterial thromboembolic event (3%), wound-healing complications (3%), proteinuria (1%), and gastrointestinal perforation (2%).

Metastatic Renal Cell Carcinoma (mRCC)

All grade adverse events were collected in Study 9. Grade 3–5 adverse events occurring at a higher incidence (≥ 2%) in 337 patients receiving interferon alfa (IFN-α) plus Avastin compared to 304 patients receiving IFN-α plus placebo arm were fatigue (13% vs. 8%), asthenia (10% vs. 7%), proteinuria (7% vs. 0%), hypertension (6% vs. 1%; including hypertension and hypertensive crisis), and hemorrhage (3% vs. 0.3%; including epistaxis, small intestinal hemorrhage, aneurysm ruptured, gastric ulcer hemorrhage, gingival bleeding, haemoptysis, hemorrhage intracranial, large intestinal hemorrhage, respiratory tract hemorrhage, and traumatic hematoma).

Grade 1–5 adverse events occurring at a higher incidence (≥5%) in patients receiving IFN-α plus Avastin compared to the IFN-α plus placebo arm are presented in Table 4.

Table 4

NCI-CTC Grades 1–5 Adverse Events in Study 9 (Occurring at Higher Incidence [≥ 5%] in IFN-α + Avastin vs. IFN-α + Placebo)

System Organ Class/Preferred term[a]	IFN-α + Placebo (n=304)	IFN-α + Avastin (n=337)
Gastrointestinal disorders		
Diarrhea	16%	21%
General disorders and administration site conditions		
Fatigue	27%	33%
Investigations		
Weight decreased	15%	20%
Metabolism and nutrition disorders		
Anorexia	31%	36%
Musculoskeletal and connective tissue disorders		
Myalgia	14%	19%
Back pain	6%	12%
Nervous system disorders		
Headache	16%	24%
Renal and urinary disorders		
Proteinuria	3%	20%
Respiratory, thoracic and mediastinal disorders		
Epistaxis	4%	27%
Dysphonia	0%	5%
Vascular disorders		
Hypertension	9%	28%

[a] Adverse events were encoded using MedDRA, Version 10.1.

The following adverse events were reported at a 5-fold greater incidence in the IFN-α plus Avastin arm compared to IFN-α alone and not represented in Table 4: gingival bleeding (13 patients vs. 1 patient); rhinitis (9 vs.0); blurred vision (8 vs. 0); gingivitis (8 vs. 1); gastroesophageal reflux disease (8 vs.1); tinnitus (7 vs. 1); tooth abscess (7 vs.0); mouth ulceration (6 vs. 0); acne (5 vs. 0); deafness (5 vs. 0); gastritis (5 vs. 0); gingival pain (5 vs. 0) and pulmonary embolism (5 vs. 1).

6.2 Immunogenicity

As with all therapeutic proteins, there is a potential for immunogenicity. The incidence of antibody development in patients receiving Avastin has not been adequately determined because the assay sensitivity was inadequate to reliably detect lower titers. Enzyme-linked immunosorbent assays (ELISAs) were performed on sera from approximately 500 patients treated with Avastin, primarily in combination with chemotherapy. High titer human anti-Avastin antibodies were not detected.

Immunogenicity data are highly dependent on the sensitivity and specificity of the assay. Additionally, the observed incidence of antibody positivity in an assay may be influenced by several factors, including sample handling, timing of sample collection, concomitant medications, and

underlying disease. For these reasons, comparison of the incidence of antibodies to Avastin with the incidence of antibodies to other products may be misleading.

6.3 Postmarketing Experience

The following adverse reactions have been identified during post-approval use of Avastin. Because these reactions are reported voluntarily from a population of uncertain size, it is not always possible to reliably estimate their frequency or establish a causal relationship to drug exposure.

Body as a Whole: Polyserositis
Cardiovascular: Pulmonary hypertension, RPLS, Mesenteric venous occlusion
Eye disorders (reported from unapproved use for treatment of various ocular disorders): Endophthalmitis; Intraocular inflammation such as iritis and vitritis; Retinal detachment; Other retinal disorders; Increased intraocular pressure; Hemorrhage following intraocular injection including conjunctival, vitreous hemorrhage or retinal hemorrhage; Vitreous floaters; Visual disturbances; Ocular hyperemia; Ocular pain and/or discomfort
Gastrointestinal: Gastrointestinal ulcer, Intestinal necrosis, Anastomotic ulceration
Hemic and lymphatic: Pancytopenia
Musculoskeletal: Osteonecrosis of the jaw
Renal: Renal thrombotic microangiopathy (manifested as severe proteinuria)
Respiratory: Nasal septum perforation, dysphonia

7 DRUG INTERACTIONS

A drug interaction study was performed in which irinotecan was administered as part of the FOLFIRI regimen with or without Avastin. The results demonstrated no significant effect of bevacizumab on the pharmacokinetics of irinotecan or its active metabolite SN38.

In a randomized study in 99 patients with NSCLC, based on limited data, there did not appear to be a difference in the mean exposure of either carboplatin or paclitaxel when each was administered alone or in combination with Avastin. However, 3 of the 8 patients receiving Avastin plus paclitaxel/carboplatin had substantially lower paclitaxel exposure after four cycles of treatment (at Day 63) than those at Day 0, while patients receiving paclitaxel/carboplatin without Avastin had a greater paclitaxel exposure at Day 63 than at Day 0.

In Study 9, there was no difference in the mean exposure of interferon alfa administered in combination with Avastin when compared to interferon alfa alone.

8 USE IN SPECIFIC POPULATIONS

8.1 Pregnancy

Pregnancy Category C

There are no adequate or well controlled studies of bevacizumab in pregnant women. While it is not known if bevacizumab crosses the placenta, human IgG is known to cross the placenta Reproduction studies in rabbits treated with approximately 1 to 12 times the recommended human dose of bevacizumab demonstrated teratogenicity, including an increased incidence of specific gross and skeletal fetal alterations. Adverse fetal outcomes were observed at all doses tested. Other observed effects included decreases in maternal and fetal body weights and an increased number of fetal resorptions. [See *Nonclinical Toxicology (13.3)*.]

Because of the observed teratogenic effects of bevacizumab in animals and of other inhibitors of angiogenesis in humans, bevacizumab should be used during pregnancy only if the potential benefit to the pregnant woman justifies the potential risk to the fetus.

8.3 Nursing Mothers

It is not known whether Avastin is secreted in human milk. Human IgG is excreted in human milk, but published data suggest that breast milk antibodies do not enter the neonatal and infant circulation in substantial amounts. Because many drugs are secreted in human milk and because of

the potential for serious adverse reactions in nursing infants from bevacizumab, a decision should be made whether to discontinue nursing or discontinue drug, taking into account the half-life of the bevacizumab (approximately 20 days [range 11–50 days]) and the importance of the drug to the mother. [See *Clinical Pharmacology (12.3)*.]

8.4 Pediatric Use

The safety, effectiveness and pharmacokinetic profile of Avastin in pediatric patients have not been established.

Antitumor activity was not observed among eight children with relapsed glioblastoma treated with bevacizumab and irinotecan. There is insufficient information to determine the safety and efficacy of Avastin in children with glioblastoma.

Juvenile cynomolgus monkeys with open growth plates exhibited physeal dysplasia following 4 to 26 weeks exposure at 0.4 to 20 times the recommended human dose (based on mg/kg and exposure). The incidence and severity of physeal dysplasia were dose-related and were partially reversible upon cessation of treatment.

8.5 Geriatric Use

In Study 1, severe adverse events that occurred at a higher incidence (≥ 2%) in patients aged ≥65 years as compared to younger patients were asthenia, sepsis, deep thrombophlebitis, hypertension, hypotension, myocardial infarction, congestive heart failure, diarrhea, constipation, anorexia, leukopenia, anemia, dehydration, hypokalemia, and hyponatremia. The effect of Avastin on overall survival was similar in elderly patients as compared to younger patients.

In Study 2, patients aged≥ 65 years receiving Avastin plus FOLFOX4 had a greater relative risk as compared to younger patients for the following adverse events: nausea, emesis, ileus, and fatigue.

In Study 4, patients aged ≥ 65 years receiving carboplatin, paclitaxel, and Avastin had a greater relative risk for proteinuria as compared to younger patients. [See *Warnings and Precautions (5.8)*.]

In Study 5, there were insufficient numbers of patients ≥ 65 years old to determine whether the overall adverse events profile was different in the elderly as compared with younger patients.

Of the 742 patients enrolled in Genentech-sponsored clinical studies in which all adverse events were captured, 212 (29%) were age 65 or older and 43 (6%) were age 75 or older. Adverse events of any severity that occurred at a higher incidence in the elderly as compared to younger patients, in addition to those described above, were dyspepsia, gastrointestinal hemorrhage, edema, epistaxis, increased cough, and voice alteration.

In an exploratory, pooled analysis of 1745 patients treated in five randomized, controlled studies, there were 618 (35%) patients aged≥65 years and 1127 patients<65 years of age. The overall incidence of arterial thromboembolic events was increased in all patients receiving Avastin with chemotherapy as compared to those receiving chemotherapy alone, regardless of age. However, the increase in arterial thromboembolic events incidence was greater in patients aged≥65 years (8.5% vs. 2.9%) as compared to those < 65 years (2.1% vs. 1.4%). [See *Warnings and Precautions (5.5)*.]

8.6 Females of Reproductive Potential

Avastin increases the risk of ovarian failure and may impair fertility. Inform females of reproductive potential of the risk of ovarian failure prior to starting treatment with Avastin. Long term effects of Avastin exposure on fertility are unknown.

In a prospectively designed substudy of 179 premenopausal women randomized to receive chemotherapy with or without Avastin, the incidence of ovarian failure was higher in the Avastin arm (34%) compared to the control arm (2%). After discontinuation of Avastin and chemotherapy, recovery of ovarian function occurred in 22% (7/32) of these Avastin-treated patients. [See *Warnings and Precautions (5.10), Adverse Reactions (6.1*).]

10 OVERDOSAGE

The highest dose tested in humans (20 mg/kg IV) was associated with headache in nine of 16 patients and with severe headache in three of 16 patients.

11 DESCRIPTION

Avastin (bevacizumab) is a recombinant humanized monoclonal IgG1 antibody that binds to and inhibits the biologic activity of human vascular endothelial growth factor (VEGF) in *in vitro* and *in vivo* assay systems. Bevacizumab contains human framework regions and the complementarity-determining regions of a murine antibody that binds to VEGF. Avastin has an approximate molecular weight of 149 kD. Bevacizumab is produced in a mammalian cell (Chinese Hamster Ovary) expression system in a nutrient medium containing the antibiotic gentamicin. Gentamicin is not detectable in the final product.

Avastin is a clear to slightly opalescent, colorless to pale brown, sterile, pH 6.2 solution for intravenous infusion. Avastin is supplied in 100 mg and 400 mg preservative-free, single-use vials to deliver 4 mL or 16 mL of Avastin (25 mg/mL). The 100 mg product is formulated in 240 mg α,α-trehalose dihydrate, 23.2 mg sodium phosphate (monobasic, monohydrate), 4.8 mg sodium phosphate (dibasic, anhydrous), 1.6 mg polysorbate 20, and Water for Injection, USP. The 400 mg product is formulated in 960 mg α,α-trehalose dihydrate, 92.8 mg sodium phosphate (monobasic, monohydrate), 19.2 mg sodium phosphate (dibasic, anhydrous), 6.4 mg polysorbate 20, and Water for Injection, USP.

12 CLINICAL PHARMACOLOGY

12.1 Mechanism of Action

Bevacizumab binds VEGF and prevents the interaction of VEGF to its receptors (Flt-1 and KDR) on the surface of endothelial cells. The interaction of VEGF with its receptors leads to endothelial cell proliferation and new blood vessel formation in *in vitro* models of angiogenesis. Administration of bevacizumab to xenotransplant models of colon cancer in nude (athymic) mice caused reduction of microvascular growth and inhibition of metastatic disease progression.

12.3 Pharmacokinetics

The pharmacokinetic profile of bevacizumab was assessed using an assay that measures total serum bevacizumab concentrations (i.e., the assay did not distinguish between free bevacizumab and bevacizumab bound to VEGF ligand). Based on a population pharmacokinetic analysis of 491 patients who received 1 to 20 mg/kg of Avastin weekly, every 2 weeks, or every 3 weeks, the estimated half-life of bevacizumab was approximately 20 days (range 11−50 days). The predicted time to reach steady state was 100 days. The accumulation ratio following a dose of 10 mg/kg of bevacizumab every 2 weeks was 2.8.

The clearance of bevacizumab varied by body weight, gender, and tumor burden. After correcting for body weight, males had a higher bevacizumab clearance (0.262 L/day vs. 0.207 L/day) and a larger V_c (3.25 L vs. 2.66 L) than females. Patients with higher tumor burden (at or above median value of tumor surface area) had a higher bevacizumab clearance (0.249 L/day vs. 0.199 L/day) than patients with tumor burdens below the median. In Study 1, there was no evidence of lesser efficacy (hazard ratio for overall survival) in males or patients with higher tumor burden treated with Avastin as compared to females and patients with low tumor burden. The relationship between bevacizumab exposure and clinical outcomes has not been explored.

13 NONCLINICAL TOXICOLOGY

13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility

No carcinogenicity or mutagenicity studies of bevacizumab have been conducted.

Bevacizumab may impair fertility. Female cynomolgus monkeys treated with 0.4 to 20 times the recommended human dose of bevacizumab exhibited arrested follicular development or absent corpora lutea as well as dose-related decreases in ovarian and uterine weights, endometrial proliferation, and the number of menstrual cycles. Following a 4- or 12-week recovery period, there was a trend suggestive of reversibility. After the 12-week recovery period, follicular maturation arrest was no longer observed, but ovarian weights were still moderately decreased. Reduced endometrial proliferation was no longer observed at the 12-week recovery time point; however, decreased uterine weight, absent corpora lutea, and reduced number of menstrual cycles remained evident.

13.2 Animal Toxicology and/or Pharmacology

In cynomolgus monkeys, when bevacizumab was administered at doses of 0.4 to 20 times the weekly human exposure, anatomical pathology revealed several adverse effects on general growth and skeletal development, fertility and wound healing capacity. Severe physeal dysplasia was consistently reported in juvenile monkeys with open growth plates receiving 0.4 to 20 times the human dose. The physeal dysplasia was characterized by a linear cessation of growth line and chondrocyte hyperplasia which did not completely resolve after the 4 to 12 weeks recovery period without drug exposure.

Rabbits dosed with bevacizumab exhibited reduced wound healing capacity. Using full-thickness skin incision and partial thickness circular dermal wound models, bevacizumab dosing resulted in reductions in wound tensile strength, decreased granulation and re-epithelialization, and delayed time to wound closure.

13.3 Reproductive and Developmental Toxicology

Pregnant rabbits dosed with 1 to 12 times the human dose of bevacizumab every three days during the period of organogenesis (gestation day 6-18) exhibited teratogenic effects, decreases in maternal and fetal body weights, and increased number of fetal resorptions. Teratogenic effects included: reduced or irregular ossification in the skull, jaw, spine, ribs, tibia and bones of the paws; meningocele; fontanel, rib and hindlimb deformities; corneal opacity; and absent hindlimb phalanges. There are no data available regarding the level of bevacizumab exposure in the offspring.

14 CLINICAL STUDIES

14.1 Metastatic Colorectal Cancer (mCRC)

Study 1

In this double-blind, active-controlled study, patients were randomized (1:1:1) to IV bolus-IFL (irinotecan 125 mg/m^2, 5-FU 500 mg/m^2, and leucovorin (LV) 20 mg/m^2 given once weekly for 4 weeks every 6 weeks) plus placebo (Arm 1), bolus-IFL plus Avastin (5 mg/kg every 2 weeks) (Arm 2), or 5-FU/LV plus Avastin (5 mg/kg every 2 weeks) (Arm 3). Enrollment in Arm 3 was discontinued, as pre-specified, when the toxicity of Avastin in combination with the bolus-IFL regimen was deemed acceptable. The main outcome measure was overall survival (OS).

Of the 813 patients randomized to Arms 1 and 2, the median age was 60, 40% were female, 79% were Caucasian, 57% had an ECOG performance status of 0, 21% had a rectal primary and 28% received prior adjuvant chemotherapy. In 56% of the patients, the dominant site of disease was extra-abdominal, while the liver was the dominant site in 38% of patients.

The addition of Avastin resulted in an improvement in survival across subgroups defined by age (< 65 yrs, ≥ 65 yrs) and gender. Results are presented in Table 5 and Figure 1.

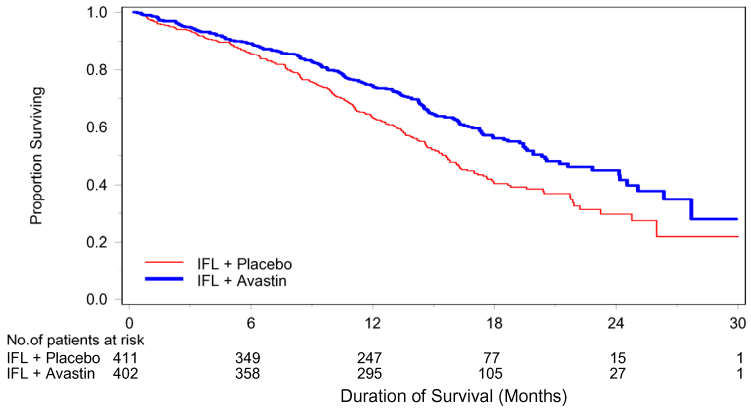
Table 5
Study 1 Efficacy Results

	IFL + Placebo	IFL + Avastin 5 mg/kg q 2 wks
Number of Patients	411	402
Overall Survival[a]		
Median (months)	15.6	20.3
Hazard ratio		0.66
Progression-free Survival[a]		
Median (months)	6.2	10.6
Hazard ratio		0.54
Overall Response Rate[b]		
Rate (percent)	35%	45%
Duration of Response		
Median (months)	7.1	10.4

[a] $p < 0.001$ by stratified log rank test.

[b] $p < 0.01$ by χ^2 test.

Figure 1
Duration of Survival in Study 1



Among the 110 patients enrolled in Arm 3, median OS was 18.3 months, median progression-free survival (PFS) was 8.8 months, objective response rate (ORR) was 39%, and median duration of response was 8.5 months.

Study 2

Study 2 was a randomized, open-label, active-controlled trial in patients who were previously treated with irinotecan ± 5-FU for initial therapy for metastatic disease or as adjuvant therapy. Patients were randomized (1:1:1) to IV FOLFOX4 (Day 1: oxaliplatin 85 mg/m^2 and LV 200 mg/m^2 concurrently, then 5-FU 400 mg/m^2 bolus followed by 600 mg/m^2 continuously; Day 2: LV 200 mg/m^2, then 5-FU 400 mg/m^2 bolus followed by 600 mg/m^2 continuously; repeated every

2 weeks), FOLFOX4 plus Avastin (10 mg/kg every 2 weeks prior to FOLFOX4 on Day 1), or Avastin monotherapy(10 mg/kg every 2 weeks). The main outcome measure was OS.

The Avastin monotherapy arm was closed to accrual after enrollment of 244 of the planned 290 patients following a planned interim analysis by the data monitoring committee based on evidence of decreased survival compared to FOLFOX4 alone.

Of the 829 patients randomized to the three arms, the median age was 61 years, 40% were female, 87% were Caucasian, 49% had an ECOG performance status of 0, 26% received prior radiation therapy, and 80% received prior adjuvant chemotherapy, 99% received prior irinotecan, with or without 5-FU as therapy for metastatic disease, and 1% received prior irinotecan and 5-FU as adjuvant therapy.

The addition of Avastin to FOLFOX4 resulted in significantly longer survival as compared to FOLFOX4 alone (median OS 13.0 months vs. 10.8 months; hazard ratio 0.75 [95% CI 0.63, 0.89], $p=0.001$ stratified log rank test) with clinical benefit seen in subgroups defined by age (<65 yrs, ≥ 65 yrs) and gender. PFS and ORR based on investigator assessment were higher in the Avastin plus FOLFOX4 arm.

Study 3

The activity of Avastin in combination with bolus or infusional 5-FU/LV was evaluated in a single arm study enrolling 339 patients with mCRC with disease progression following both irinotecan- and oxaliplatin-containing chemotherapy regimens. Seventy-three percent of patients received concurrent bolus 5-FU/LV. One objective partial response was verified in the first 100 evaluable patients for an overall response rate of 1% (95% CI 0–5.5%).

14.2 Unresectable Non–Squamous Non–Small Cell Lung Cancer (NSCLC)

Study 4

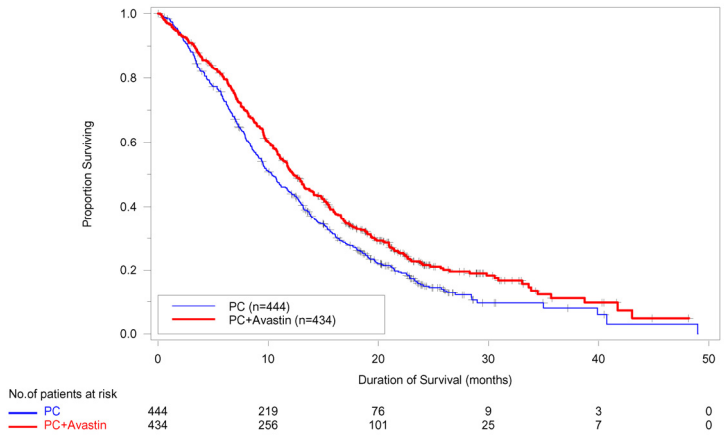
The safety and efficacy of Avastin as first-line treatment of patients with locally advanced, metastatic, or recurrent non–squamous NSCLC was studied in a single, large, randomized, active-controlled, open-label, multicenter study.

Chemotherapy-naïve patients with locally advanced, metastatic or recurrent non–squamous NSCLC were randomized (1:1) to receive six 21-day cycles of paclitaxel 200 mg/m^2 and carboplatin AUC=6.0, by IV on day 1 (PC) or PC in combination with Avastin 15 mg/kg by IV on day 1 (PC plus Avastin). After completion or upon discontinuation of chemotherapy, patients in the PC plus Avastin arm continued to receive Avastin alone until disease progression or until unacceptable toxicity. Patients with predominant squamous histology (mixed cell type tumors only), central nervous system (CNS) metastasis, gross hemoptysis (≥1/2 tsp of red blood), unstable angina, or receiving therapeutic anticoagulation were excluded. The main outcome measure was duration of survival.

Of the 878 patients randomized, the median age was 63, 46% were female, 43% were ≥ age 65, and 28% had ≥ 5% weight loss at study entry. Eleven percent had recurrent disease and of the 89% with newly diagnosed NSCLC, 12% had Stage IIIB with malignant pleural effusion and 76% had Stage IV disease.

The results are presented in Figure 2. OS was statistically significantly higher among patients receiving PC plus Avastin compared with those receiving PC alone; median OS was 12.3 months vs. 10.3 months [hazard ratio 0.80 (repeated 95% CI 0.68, 0.94), final p- value 0.013, stratified log-rank test]. Based on investigator assessment which was not independently verified, patients were reported to have longer PFS with Avastin in combination with PC compared to PC alone.

Figure 2
Duration of Survival in Study 4



In an exploratory analyses across patient subgroups, the impact of Avastin on OS was less robust in the following: women [HR = 0.99 (95% CI: 0.79, 1.25)], age ≥ 65 years [HR = 0.91 (95% CI: 0.72, 1.14)] and patients with ≥5% weight loss at study entry [HR = 0.96 (95% CI: 0.73, 1.26)].

The safety and efficacy of Avastin in patients with locally advanced, metastatic or recurrent non-squamous NSCLC, who had not received prior chemotherapy was studied in another randomized, double-blind, placebo controlled, three-arm study of Avastin in combination with cisplatin and gemcitabine (CG) versus placebo and CG. A total of 1043 patients were randomized 1:1:1 to receive placebo plus CG, Avastin 7.5 mg/kg plus CG or Avastin 15.0 mg/kg plus CG. The median age was 58 years, 36% were female, and 29% were ≥ age 65. Eight percent had recurrent disease and 77% had Stage IV disease. Progression-free survival, the main efficacy outcome measure, was significantly higher in both Avastin containing arms compared to the placebo arm [HR 0.75 (95% CI 0.62, 0.91), p=0.0026 for the Avastin 7.5 mg/kg plus CG arm and HR 0.82 (95% CI 0.68; 0.98), p=0.0301 for the Avastin 15.0 mg/kg plus CG arm]. The addition of Avastin to CG chemotherapy failed to demonstrate an improvement in the duration of overall survival, an additional efficacy outcome measure, [HR 0.93 (95% CI 0.78; 1.11), p=0.4203 for the Avastin 7.5 mg/kg plus CG arm and HR 1.03 (95% CI 0.86; 1.23), p=0.7613 for the Avastin 15.0 mg/kg plus CG arm].

14.3 Metastatic Breast Cancer (MBC)

Study 5

The efficacy and safety of Avastin as first-line treatment of patients with MBC was studied in a single, open-label, randomized, multicenter study. Patients who had not received chemotherapy for locally recurrent or MBC were randomized (1:1) to receive paclitaxel (90 mg/m^2 IV once weekly for 3 out of 4 weeks) alone or in combination with Avastin (10 mg/kg IV infusion every 2 weeks). Patients were treated until disease progression or unacceptable toxicity. In situations where paclitaxel was discontinued or held, treatment with Avastin alone could be continued until disease progression. Patients with breast cancer overexpressing HER2 were not eligible unless they had received prior therapy with trastuzumab.

Prior hormonal therapy for the treatment of metastatic disease was allowed, as was prior adjuvant chemotherapy or hormonal therapy. Adjuvant taxane therapy, if received, must have been completed 12 or more months prior to study entry. Patients with central nervous system metastasis were excluded. The main outcome measure of the study was PFS as assessed by independent radiographic review. Secondary outcome measures were OS and ORR.

Of the 722 patients randomized, the median age was 55 years, 76% were white, 55% were postmenopausal, and 64% were ER and/or PR positive. Patient characteristics were similar across

treatment arms. Thirty-six percent had received prior hormonal therapy for advanced disease, and 66% had received adjuvant chemotherapy, including 20% with prior taxane use and 50% with prior anthracycline use. Efficacy results are summarized in Table 6.

Table 6
Avastin Efficacy Results from Study 5

Efficacy Parameter	Avastin + Paclitaxel (n=368)	Paclitaxel Alone (n=354)	p-value	HR (95% CI)
Progression-free Survival	11.3	5.8		0.48
[median, months (95% CI)]	(10.5, 13.3)	(5.4, 8.2)	<0.0001	(0.39, 0.61)
Overall Survival	26.5	24.8		0.87
[median, months (95% CI)]	(23.7, 29.2)	(21.4, 27.4)	0.14	(0.72, 1.05)
Partial Response Rate[a] (PR)	48.9%[b]	22.2%	<0.001	—

[a] Includes only patients with measurable disease.
[b] The difference in partial response rates is 26.7% with a 95% CI (18.4%, 35.0%).

The addition of Avastin to paclitaxel resulted in an improvement in PFS with no significant improvement in OS. Partial response rates in patients with measurable disease were higher with Avastin plus paclitaxel. No complete responses were observed.

Thirty-four percent of the patients had incomplete follow-up for disease progression; therefore an exploratory analysis using similar imputation between arms was performed, which yielded a hazard ratio of 0.57.

Study 6

The efficacy and safety of Avastin as second- and third-line treatment of patients with MBC was studied in a single open-label randomized study. Patients who had received prior anthracycline and taxane therapy in the adjuvant setting or for their MBC were randomized (1:1) to receive capecitabine alone or in combination with Avastin. Of the 462 enrolled patients, the median age was 51 years, 81% were white, and 50% were ER positive. Patient characteristics were similar across the treatment arms.

The study failed to demonstrate a statistically significant effect on PFS or OS. The median PFS was 4.2 months in the capecitabine arm and 4.9 months in the capecitabine plus Avastin arm (log-rank p-value = 0.86, hazard ratio 0.98). The median OS was 14.5 months in the capecitabine arm and 15.1 months in the capecitabine plus Avastin arm (hazard ratio of 1.08).

14.4 Glioblastoma

Study 7

The efficacy and safety of Avastin was evaluated in Study 7, an open-label, multicenter, randomized, non-comparative study of patients with previously treated glioblastoma. Patients received Avastin (10 mg/kg IV) alone or Avastin plus irinotecan every 2 weeks until disease progression or until unacceptable toxicity. All patients received prior radiotherapy (completed at least 8 weeks prior to receiving Avastin) and temozolomide. Patients with active brain hemorrhage were excluded.

Of the 85 patients randomized to the Avastin arm, the median age was 54 years, 32% were female, 81% were in first relapse, Karnofsky performance status was 90–100 for 45% and 70–80 for 55%.

The efficacy of Avastin was demonstrated using response assessment based on both WHO radiographic criteria and by stable or decreasing corticosteroid use, which occurred in 25.9% (95% CI 17.0%, 36.1%) of the patients. Median duration of response was 4.2 months (95% CI 3.0, 5.7).

Radiologic assessment was based on MRI imaging (using T1 and T2/FLAIR). MRI does not necessarily distinguish between tumor, edema, and radiation necrosis.

Study 8

Study 8, was a single-arm, single institution trial with 56 patients with glioblastoma. All patients had documented disease progression after receiving temozolomide and radiation therapy. Patients received Avastin 10 mg/kg IV every 2 weeks until disease progression or unacceptable toxicity.

The median age was 54, 54% were male, 98% Caucasian, and 68% had a Karnofsky Performance Status of 90–100.

The efficacy of Avastin was supported by an objective response rate of 19.6% (95% CI 10.9%, 31.3%) using the same response criteria as in Study 7. Median duration of response was 3.9 months (95% CI 2.4, 17.4).

14.5 Metastatic Renal Cell Carcinoma (mRCC)

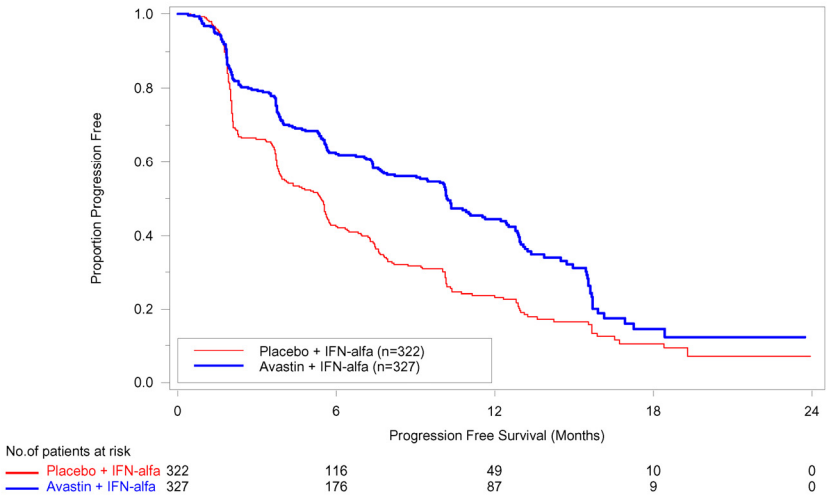
Study 9

Patients with treatment-naïve mRCC were evaluated in a multicenter, randomized, double-blind, international study comparing Avastin plus interferon alfa 2a (IFN- α2a) versus placebo plus IFN-α2a. A total of 649 patients who had undergone a nephrectomy were randomized (1:1) to receive either Avastin (10 mg/kg IV infusion every 2 weeks; n=327) or placebo (IV every 2 weeks; n=322) in combination with IFN-α2a (9 MIU subcutaneously three times weekly, for a maximum of 52 weeks). Patients were treated until disease progression or unacceptable toxicity. The main outcome measure of the study was investigator-assessed PFS. Secondary outcome measures were ORR and OS.

The median age was 60 years (range 18–82), 96% were white, and 70% were male. The study population was characterized by Motzer scores as follows: 28% favorable (0), 56% intermediate (1-2), 8% poor (3-5), and 7% missing.

The results are presented in Figure 3. PFS was statistically significantly prolonged among patients receiving Avastin plus IFN-α2a compared to those receiving IFN-α2a alone; median PFS was 10.2 months vs. 5.4 months [HR 0.60 (95% CI 0.49, 0.72), p-value < 0.0001, stratified log-rank test]. Among the 595 patients with measurable disease, ORR was also significantly higher (30% vs. 12%, p < 0.0001, stratified CMH test). There was no improvement in OS based on the final analysis conducted after 444 deaths, with a median OS of 23 months in the Avastin plus IFN-α2a arm and 21 months in the IFN-α2a plus placebo arm [HR 0.86, (95% CI 0.72, 1.04)].

Figure 3
Progression-Free Survival in Study 9



16 HOW SUPPLIED/STORAGE AND HANDLING

Avastin vials [100 mg (NDC 50242-060-01) and 400 mg (NDC 50242-061-01)] are stable at 2–8°C (36–46°F). Avastin vials should be protected from light. **Do not freeze or shake.**

Diluted Avastin solutions may be stored at 2–8°C (36–46°F) for up to 8 hours. Store in the original carton until time of use. No incompatibilities between Avastin and polyvinylchloride or polyolefin bags have been observed.

17 PATIENT COUNSELING INFORMATION

Advise patients:

- To undergo routine blood pressure monitoring and to contact their health care provider if blood pressure is elevated.
- To immediately contact their health care provider for unusual bleeding, high fever, rigors, sudden onset of worsening neurological function, or persistent or severe abdominal pain, severe constipation, or vomiting.
- Of increased risk of wound healing complications during and following Avastin.
- Of increased risk of an arterial thromboembolic event.
- Of the potential risk to the fetus during and following Avastin and the need to continue adequate contraception for at least 6 months following last dose of Avastin.
- Of the increased risk for ovarian failure following Avastin treatment.

Avastin® (bevacizumab)

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