



# Predictors of Attrition in Patients With Metastatic Colorectal Cancer (MCRC)

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## INTRODUCTION

Colorectal cancer (CRC) is the third most frequently diagnosed cancer among Canadians, and the second and third most prevalent cause of cancer-related deaths in males and females respectively. An under-recognized challenge treatment of CRC is patient drop-out. Chemotherapy recipients are, in general, more likely to experience higher attrition rates, given the length of treatment and the associated side-effect burden. CRC patients, compared to other cancer patients, are subject to higher rates of complication following primary resection, which can further increase the odds of attrition during metastatic treatment. This study aimed to adequately characterize attrition rates and associated demographics, to promote efficient utilization of healthcare services, and increase medical focus on the most vulnerable groups, ultimately increasing survivorship and quality of life for patients.

## METHODS AND MATERIALS

Medical records of patients who were diagnosed with metastatic colorectal cancer (MCRC) from 2008-10 and referred to any 1 of 5 cancer centers in British Columbia were merged with systemic therapy data from the provincial pharmacy database. We classified patients into mutually exclusive treatment categories: a) receipt of all available lines of MCRC treatments; b) attrition directly attributable to disease, such as cancer progression or death; c) attrition attributable to other clinical factors, including toxicity, and d) attrition secondary to nonclinical factors, including personal/social characteristics. Multivariate logistic regression models were constructed to identify predictors.

## RESULTS

We identified 525 eligible MCRC patients: median age 64 years, 57% men, 55% Caucasian, 68% ECOG 0/1, 41% and 35% never and ever smokers, respectively. The attrition rate was 40% (95% CI, 36%-44%) for first line treatment, 25% (95% CI, 19%-31%) for second line treatment and 14% (95% CI, 5.5%-22.5%) for third line. While cancer progression (31%) and chemo toxicity (30%) were the most common attrition causes, other frequent attrition causes included death (20%) and patient preference (14%). On multivariable analysis, first-line treatment attrition was associated with worse baseline ECOG (odds ratio 1.92;  $p < 0.001$ ) and older age at diagnosis of MCRC (odds ratio 1.04;  $p < 0.001$ ). When we examined attrition over all lines, it was significantly correlated with worse ECOG (odds ratio 2.44;  $p < 0.001$ ).

## RESULTS

Variable	Attrition Post Line 1	%	Line 1 P-Value	Attrition Post Line 2	%	Line 2 P-Value	Attrition Post Line 3	%	Line 3 P-Value	Overall Attrition P-Value	
Gender	M	116	55%	0.498	74	56%	0.543	50	66%	0.372	0.634
	F	95	45%		58	44%		26	34%		
		211			132			76			
ECOG	0	20	9%	0	21	16%	0.005	15	20%	0.19	0.0
	1	63	30%		51	39%		32	42%		
	2	47	22%		16	12%		11	14%		
	3	31	15%		15	11%		2	3%		
BMI	Underweight	5	2%	0.82	8	6%	0.271	1	1%	0.798	0.896
	Healthy	80	38%		52	39%		28	37%		
	Overweight	50	24%		31	23%		23	30%		
	Obese	18	9%		15	11%		8	11%		
	Extremely Obese	8	4%		7	5%		4	5%		
Alcohol	no	71	34%	0.576	43	33%	0.223	20	26%	0.296	0.918
	socially	81	38%		54	41%		39	51%		
	daily	10	5%		8	6%		6	8%		
	excessive	18	9%		16	12%		5	7%		
Smoking	No	79	37%	0.539	66	50%	0.463	30	39%	0.687	0.471
	currently	35	17%		21	16%		14	18%		
	previously	78	37%		40	30%		29	38%		
Occupation University Degree	No	95	45%	0.086	51	39%	0.362	28	37%	0.127	0.191
	Yes	65	31%		58	44%		35	46%		
Cancer History in Family	No	70	33%	0.009	32	24%	0.475	19	25%	0.675	0.544
	Yes	100	47%		83	63%		47	62%		
Partner/Spouse	No	71	34%	0.006	31	23%	0.845	15	20%	0.579	0.809
	Yes	119	56%		94	71%		53	70%		
Children	Non	33	16%	0.308	20	15%	0.957	13	17%	0.406	0.315
	Dependable	25	12%		21	16%		10	13%		
	Independable	133	63%		73	55%		46	61%		
Ethnicity	Caucasian	121	57%	0.482	71	54%	0.362	41	54%	0.728	0.614
	East Asian	20	9%		13	10%		12	16%		
	Other	70	33%		48	36%		23	30%		
Comorbidities	By Type, Top-5 Most Prevalent Comorbidities			0.083			0.38		0.88	0.482	
	By Number of Comorbidities Per Patient			0.027			0.667		0.18	0.378	
Admittance Location	Abbotsford	31	15%	0.006	17	13%	0.279	20	26%	0.177	0.308
	North	0	0%		0	0%		0	0%		
	Southern Interior	18	9%		12	9%		7	9%		
	Fraser Valley	70	33%		29	22%		19	25%		
	Vancouver	56	27%		56	42%		23	30%		
	V - Island	36	17%		18	14%		7	9%		
Primary Resection	Yes	137	58%	0.001	94	62%	0.057	62	60%	0.816	0.004
	No	74	31%		38	25%		14	14%		
Prior Chemo	Yes	35	15%	0.409	25	16%	0.94	12	12%	0.522	0.194
	No	176	74%		107	70%		64	62%		

Table 1 – Significance of baseline characteristics towards overall attrition

## CONCLUSION

- ECOG Status of patients, at the time of MCRC diagnosis, was identified as a predictor of attrition.
- Status of primary tumour resection was also considered as a predictor of attrition; patients with a primary resection were less likely to experience attrition
  - However, we believe this may be due to a confounding variable, as most MCRC patients did have a primary resection, and therefore have had better post operative prognosis if they are approved to receive chemotherapy.
- Smoking and alcohol consumption were not identified as a significant predictor of attrition.
- Treatment attrition is a prevalent problem in MCRC and can hinder the benefit of sequential treatment algorithms. Some causes of attrition are potentially modifiable and may reflect opportunities for patients to maximize exposure to all lines of therapies.



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