Supplementary Online Content

Shen S, Chen X, Cai J, et al. Effect of dasatinib vs imatinib in the treatment of pediatric Philadelphia chromosome–positive acute lymphoblastic leukemia: a randomized clinical trial. *JAMA Oncol.* Published online January 16, 2020. doi:10.1001/jamaoncol.2019.5868

eMethods. Trial Design and Oversight and Statistical Methods

eTable 1. Criteria for Classification of Risk Groups

eTable 2. Remission Induction, Consolidation, and Continuation/Reinduction Therapy

eTable 3. Baseline Demographic and Disease Characteristics of the Patients

eTable 4. Comparison of Minimal Residual Disease Levels on Day 19 and Day 46 of Remission Induction Between Patient's Intent-to-Treat With Dasatinib or Imatinib

eTable 5. Univariate Cox Proportional Hazards Rate Regression Analysis of Event-Free Survival Within Each Treatment Arm

eTable 6. Baseline Demographic and Disease Characteristics of As-Treated Patients

eTable 7. Comparison of Minimal Residual Disease Levels on Day 19 and Day 46 of Remission Induction Between Patients As-Treated With Dasatinib or Imatinib

eTable 8. Multivariable Cox Proportional Hazards Regression Analysis of Event-Free Survival Among As-Treated Patients With Treatment Abandonment and Refusal of Protocol Treatment Considered as Adverse Events

eTable 9. Comparison of Toxicity Between Patients As-Treated With Dasatinib or Imatinib

eFigure 1. Survival by As-Treated Groups

eFigure 2. Cumulative Risk by As-Treated Groups

eFigure 3. Event-Free and Overall Survival of Patients Treated in St Jude Total XVI Study

eAppendix. Run-time Printout Log

This supplementary material has been provided by the authors to give readers additional information about their work.

eMethods. Trial Design and Oversight and Statistical Methods

Trial Design and Oversight

In the statistical design, the test used to assess power was two-sided log-rank test at the 0.05 significance level. The sample size was determined on the basis of both accrual rate and time (feasibility), and statistical power. Based on the historical data, we anticipated that it was feasible to enroll 204 patients in 3 years, and then based on this sample size and the desired effect size, we calculated the statistical power. Clinically, we wished to gain 10% in the event-free survival rate. Design of the interim analysis was based on the inclusion-exclusion principle. Essentially, if the type-I error probability at the first test (interim analysis) is ≤0.01 and that at the second test (final analysis) is ≤0.05, then by the inclusion-exclusion principle, the overall type-I error probability of the study is no bigger than 0.06.

Statistical Methods

Most of the analyses included all eligible patients. There were few analyses, mainly those involving minimal residual disease (MRD), that lacked data for up to 6 patients. Because MRD is affected by very complex biological processes, reliable imputation of its value is impossible by the available methods. Therefore, in the analyses involving MRD, cases with missing data were excluded (rather than imputed). Multiple imputation was not applied in this study.

eTable 1. Criteria for Classification of Risk Groups

Criteria for low-risk ALL

- B-cell ALL meeting one of the following criteria:

1. Age ≥ 365 days and < 10 years and presenting leukocyte count ≤50 x 10^9/L; or
2. Hyperdiploidy with chromosome number ≥ 50 or DNA index ≥1.16; or
3. *ETV6-RUNX1* gene fusion positive

- MUST not have:

1. CNS-3 status (≥ 5 leukocytes/μL of cerebrospinal fluid with morphologically identifiable blasts or cranial nerve palsy)
2. Overt testicular leukemia (as evidenced by ultrasonogram).
3. Adverse genetic features: t(9;22) or *BCR-ABL1* fusion; t(1;19) or *TCF3-PBX1* fusion; rearranged *KMT2A* (as measured by FISH and / or PCR); or hypodiploidy (<44 chromosomes); iAMP21
4. Poor early response with day 19 minimal residual disease (MRD) ≥ 1% OR day 19 MRD ≥0.01% and day 46 MRD ≥0.01%

Criteria for intermediate-risk ALL

1. T-cell ALL
2. Philadelphia chromosome-positive ALL
3. Presence of rearranged *KMT2A* with age ≥ 6 months at presentation OR presenting leukocyte count < 300x10^9/L
4. Hypodiploidy with chromosome number < 44
5. All cases that do not meet the criteria for low risk or high risk

Criteria for high-risk ALL

1. Intermediate risk patient with induction failure (presence of ≥ 5% blast by morphologic assessment of bone marrow aspirate on day 46 for patients without MRD marker) OR MRD ≥ 1% on day 46
2. Infants <6 months with *KMT2A* rearrangement and presenting leukocyte count ≥ 300x10^9/L.

eTable 2. Remission Induction, Consolidation, and Continuation/Reinduction Therapy

A: Remission induction therapy

Agents	Dosages and routes	No. Doses	Schedules
All participants			
Dexamethasone	6 mg/m2 per day orally or IV (b.i.d.)		Days 1-4
Prednisone	45 mg/m^2 (60 mg/m^2 for T-ALL) per day orally (t.i.d.)	84	Days 5-28
Vincristine	1.5 mg/m^2 IV (max 2 mg)	4	Days 5, 12, 19, 26
Daunorubicin	25 mg/m^2 IV	2	Days 5 and 12
Pegaspargase	2,000 $units/m^2$ IM	1	Days 6 and 26
Triple intrathecal*	Age-dependent	3 to 5	Days 5, (8), 12, (15), 19, 29
Cyclophosphamide	1000 mg/m^2 IV over 1 hour	1	Day 29
Cytarabine	50 mg/m^2 IH every 12 hours	14	Days 29-35
Mercaptopurine	60 mg/m^2 per dose orally	7	Days 29-33
Only participants with Day 19 MRD $\geq$ 1% received the course below			
Vincristine	1.5 mg/m^2 IV (max 2 mg)	2	Days 50 and 57
Pegaspargase	2000 $units/m^2$ IM	1	Day 50
Cyclophosphamide	1000 mg/m^2 IV over 1 hour	1	Day 50
Cytarabine	50 mg/m^2 SQ every 12 hours	14	Days 50-56
Mercaptopurine	60 mg/m^2/dose orally	14	Days 22-35
Triple intrathecal	Age-dependent	1	Day 50

*Triple intrathecal treatment (methotrexate 6, 9, 12.5 mg; dexamethasone 2.5, 2.5, 5 mg, and cytarabine 15, 25, 35 mg for ages <12, 12 to 35, and ≥36 months, respectively); extra triple intrathecal treatment on days 8 and 15 for patients with T-cell ALL, CNS-3 status (≥5 leukocytes/μL of cerebrospinal fluid with blasts or cranial palsy), CNS-2 status (<5 leukocytes/μL of cerebrospinal fluid with blasts) or traumatic lumbar puncture (>10 erythrocytes/μL of cerebrospinal fluid).

B: Consolidation therapy

Agent	Dosage and Route	# Doses	Schedule
High-dose Methotrexate	5.0 gm/m^2 IV over 24 hours	4	Days 1, 15, 29 and 43
Mercaptopurine	25 mg/m^2/day orally	56	Days 1 to 56
Leucovorin	15 mg/m^2 IV	12	42, 48 and 54 hours after the start of high-dose methotrexate
Triple intrathecal	Age-dependent	4	Days 1, 15, 29, and 43

C: Continuation/reinduction therapy (weeks 1 to 19)

Week	Treatment
1*	Pegaspargase + Mercaptopurine + Dexamethasone + Vincristine + Daunorubicin
2	Mercaptopurine
3	Mercaptopurine
4*	Pegaspargase + Mercaptopurine + Dexamethasone + Vincristine + Daunorubicin
5	Mercaptopurine
6	Mercaptopurine
7*	Pegaspargase + Mercaptopurine + Dexamethasone + Vincristine + Daunorubicin
8	Mercaptopurine
9	Mercaptopurine
10*	Pegaspargase + Mercaptopurine + Dexamethasone + Vincristine + Daunorubicin
11	Mercaptopurine
12	Mercaptopurine
13*	Pegaspargase + Mercaptopurine + Dexamethasone + Vincristine + Daunorubicin
14	Mercaptopurine
15	Mercaptopurine
16	Mercaptopurine
17*	Reinduction

18	Reinduction
19	Reinduction

* Triple intrathecal treatment (methotrexate 6, 9, 12.5 mg; dexamethasone 2.5, 2.5, 5 mg, and cytarabine 15, 25, 35 mg for ages <12, 12 to 35, and ≥36 months, respectively).

Pegaspargase 2000 units/m^2 IM; Mercaptopurine 25 mg/m^2 orally daily for 7 days every week; Dexamethasone 12 mg/m^2 orally per day in 2 divided doses for 5 days; Vincristine 1.5 mg/m^2 IV (max. 2 mg); Daunorubicin 25 mg/m2.

Reinduction therapy

Drug	Dose and route	Schedule
Dexamethasone	8 mg/m^2/day, orally, b.i.d	Days 1 - 7, Days 15 - 21
Vincristine	1.5 mg/m^2 IV (max. 2mg)	Days 1, 8, 15
Ara-C	2 gm/m^2, IV, q12h	Days 1, 2
Pegaspargase	2,000 U/m^2 IM	Day 3
Triple intrathecal treatment	Age-dependent	Day 1

D: Continuation (weeks 20 to 120)

Week	Treatment
20	Mercaptopurine + Methotrexate
21	Mercaptopurine + Methotrexate
22*	Cyclophosphamide + Cytarabine + Dexamethasone + Vincristine
23	No chemotherapy
4 weekly cycles for 5 courses	
40	Mercaptopurine + Methotrexate
41	Mercaptopurine + Methotrexate
42	Mercaptopurine + Methotrexate
43	Mercaptopurine + Methotrexate
44	Mercaptopurine + Methotrexate
45	Mercaptopurine + Methotrexate
46	Cyclophosphamide + Cytarabine + Dexamethasone + Vincristine
47	No chemotherapy
8 weekly cycles for 7 courses	
96-111	Mercaptopurine + Methotrexate

* Triple intrathecal treatment (methotrexate 6, 9, 12.5 mg; Dexamethasone 2.5, 2.5, 5 mg, and cytarabine 15, 25, 35 mg for ages <12, 12 to 35, and ≥36 months, respectively) on weeks 22, 26, 30, 34 and 38.

Mercaptopurine 50 mg/m^2 orally daily for 7 days; Methotrexate 25 mg/m^2 orally on day 1; Cyclophosphamide 300 mg/m^2 IV on day 1; Cytarabine 300 mg/m^2 IV on day 1; Dexamethasone 8 mg/m^2 orally per day in 2 divided doses for 7 days between week 20 and 39, and then 6 mg/m^2 orally per day in divided doses for 7 days between week 40 and 95.

eTable 3. Baseline Demographic and Disease Characteristics of the Patients

Factor	Category	Total n (%)	Imatinib n (%)	Dasatinib n (%)	*p* value
Age (years)*	<1	1 (0.53)	1 (1.03)	0 (0)	0.82
	1 to 9	126 (66.67)	63 (64.95)	63 (68.48)	
	≥ 10	62 (32.80)	33 (34.02)	29 (31.52)	
Sex	Male	136 (71.96)	70 (72.16)	66 (71.74)	0.99
	Female	53 (28.04)	27 (27.84)	26 (28.26)	
Leukocyte count at diagnosis† ($\times 10^3/\mu L$)	<50	75 (39.68)	32 (32.99)	43 (46.74)	0.12
	50 to <100	32 (16.93)	20 (20.62)	12 (13.04)	
	≥100	82 (43.39)	45 (46.39)	37 (40.22)	
CNS status	CNS1	170 (89.95)	87 (89.69)	83 (90.22)	0.99
	CNS2/Traumatic lumbar puncture	13 (6.88)	7 (7.22)	6 (6.52)	
	CNS3	6 (3.17)	3 (3.09)	3 (3.26)	
Lineage	B	185 (97.88)	95 (97.94)	90 (97.83)	0.99
	T	4 (2.12)	2 (2.06)	2 (2.17)	
t(9;22) (q34;q12.2)	FISH only	6 (3.17)	1 (1.03)	5 (5.43)	0.11
	RT-PCR only	14 (7.41)	5 (5.15)	9 (9.78)	
	Both	169 (89.42)	91 (93.81)	78 (84.78)	
BCR-ABL	p190	127 (84.11)	65 (82.28)	62 (86.11)	0.66
	p210	24 (15.89)	14 (17.72)	10 (13.89)	
Initial risk	Intermediate	189 (100)	97 (100)	92 (100)	0.99
	High	0 (0)	0 (0)	0 (0)	
Final risk	Intermediate	184 (97.35)	93 (95.88)	91 (98.91)	0.37
	High	5 (2.65)	4 (4.12)	1 (1.09)	

CNS, central nervous system; * median, 7.8 years (IQR 5.2-11.3, range 0.8-16.8); †median, 69.9 per µL (range, 1.2-726.1).

eTable 4. Comparison of Minimal Residual Disease Levels on Day 19 and Day 46 of Remission Induction Between Patient's Intent-to-Treat With Dasatinib or Imatinib

Status	Category	Total n (%)	Imatinib n (%)	Dasatinib n (%)	*P* value
MRD, day 19	<0.01%	65 (34.57)	28 (29.17)	37 (40.22)	0.21
	0.01%-<1%	79 (42.02)	42 (43.75)	37 (40.22)	
	1% to <5%	*17 (9.04)*	8 (8.33)	9 (9.78)	
	≥5%	27 (14.36)	18 (18.75)	9 (9.78)	
MRD, day 46	<0.01%	145 (78.80)	72 (77.42)	73 (80.22)	0.51
	0.01%-<1%	34 (18.48)	17 (18.28)	17 (18.68)	
	≥1%	5 (2.72)	4 (4.30)	1 (1.10)	
Complete remission at end of induction	Yes	183 (96.83)	92 (94.85)	91 (98.91)	0.21
	No	6 (3.17)	5 (5.15)	1 (1.09)	

MRD, minimal residual disease

eTable 5. Univariate Cox Proportional Hazards Rate Regression Analysis of Event-Free Survival Within Each Treatment Arm

Factor	Category	Imatinib				Dasatinib			
		n (%)	HR	95% CI	*p* value	n (%)	HR	95% CI	*p* value
Age*	1 to 9	63 (65.63)				63 (68.48)			
	≥ 10	33 (34.38)	2.43	1.16~5.10	0.02	29 (31.52)	1.30	0.44~3.87	0.64
Sex	Female	27 (27.84)				26 (28.26)			
	Male	70 (92.16)	0.63	0.29~1.40	0.26	66 (71.74)	1.15	0.37~3.64	0.81
Leukocyte count at diagnosis (×10^3/μL)	<100	52 (53.61)				55 (59.78)			
	≥ 100	45 (46.39)	3.44	1.56~7.56	0.002	37 (40.22)	3.20	1.09~9.37	0.03
CNS status	CNS1	87 (89.69)				83 (90.22)			
	CNS2/Traumatic lumbar puncture	7 (7.22)	1.49	0.45~4.95	0.52	6 (6.52)	0	0	0.99
	CNS3	3 (3.09)	1.76	0.24~13.13	0.58	3 (3.26)	5.10	1.13~22.98	0.03
Lineage	B	95 (97.94)				90 (97.83)			
	T	2 (2.06)	11.29	2.54~50.22	0.001	2 (2.17)	6.12	0.78~47.64	0.08
BCR-ABL	p190	65 (82.28)				62 (86.11)			
	p210	14 (17.72)	0.71	0.21~2.40	0.59	10 (13.89)	0.60	0.07~4.86	0.63
Final risk	Intermediate	93 (95.88)				91 (98.91)			
	High	4 (4.12)	3.07	0.91~10.33	0.07	1† (1.09)	87.5	5.5-1399	0.002
MRD, day 19	<5%	78 (81.25)				83 (90.22)			
	≥5%	18 (18.75)	2.21	1.01~4.83	0.048	9 (9.78)	3.84	1.22~12.09	0.02
MRD, day 46	<0.01%	72 (77.42)				73 (80.22)			
	≥0.01%	21 (22.58)	2.92	1.35~6.31	0.006	18 (19.78)	4.21	1.52~11.67	0.006

*The single infant in the imatinib group was excluded. † This high-risk patient failed to achieve remission; CNS, central nervous system; MRD, minimal residual disease; HR, hazard ratio of event-free survival

eTable 6. Baseline Demographic and Disease Characteristics of As-Treated Patients

Factor	Category	Total n (%)	Imatinib n (%)	Dasatinib n (%)	*P* value
Age (years)	<1	1 (0.53)	1 (1.05)	0 (0)	0.99
	1 to 9	126 (66.67)	63 (66.32)	63 (67.02)	
	≥ 10	62 (32.80)	31 (32.63)	31 (32.98)	
Sex	Male	136 (71.96)	66 (69.47)	70 (74.47)	0.52
	Female	53 (28.04)	29 (30.53)	24 (25.53)	
Leukocyte count at diagnosis (×10^3/μL)					0.21
	<50	75 (39.68)	32 (33.68)	43 (45.74)	
	50 to <100	32 (16.93)	19 (20.00)	13 (13.83)	
	≥100	82 (43.39)	44 (46.32)	38 (40.43)	
CNS status	CNS-1	170 (89.95)	87 (91.58)	83 (88.30)	0.66
	CNS-2/Traumatic Tap	13 (6.88)	6 (6.32)	7 (7.44)	
	CNS-3/Intracranial infiltration	6 (3.17)	2 (2.11)	4 (4.26)	
Lineage	B	185 (97.88)	92 (96.84)	93 (98.94)	0.62
	T	4 (2.12)	3 (3.16)	1 (1.06)	
t(9;22)(q34;q11.2)	FISH only	6 (3.17)	2 (2.11)	4 (4.26)	0.37
	RT-PCR only	14 (7.41)	5 (5.26)	9 (9.57)	
	Both	169 (89.42)	88 (92.63)	81 (86.17)	
BCR-ABL	p190	127 (84.11)	62 (84.93)	65 (83.33)	0.83
	p 210	24 (15.89)	11 (15.07)	13 (16.67)	
Initial risk					0.99
	Intermediate	189 (100)	95 (100)	94 (100)	
	High	0 (0)	0 (0)	0 (0)	
Final risk					0.37
	Intermediate	184 (97.35)	91 (95.79)	93 (98.94)	
	High	5 (2.65)	4 (4.21)	1 (1.06)	

CNS, central nervous system

eTable 7. Comparison of Minimal Residual Disease Levels on Day 19 and Day 46 of Remission Induction Between Patients As-Treated With Dasatinib or Imatinib

Status	Category	Total n (%)	Imatinib n (%)	Dasatinib n (%)	*P* value
MRD, day 19	<0.01%	65 (34.57)	27 (28.72)	38 (40.43)	0.09
	0.01%-<1%	79 (42.02)	40 (42.55)	39 (41.49)	
	1% to <5%	17 (9.04)	8 (8.51)	9 (9.57)	
	≥5%	27 (14.36)	19 (20.21)	8 (8.51)	
MRD, day 46	<0.01%	145 (78.80)	70 (76.92)	75 (80.65)	0.46
	0.01%-<1%	34 (18.48)	17 (18.68)	17 (18.28)	
	≥1%	5 (2.72)	4 (4.40)	1 (1.08)	
Complete remission at end of induction	Yes	183 (96.83)	90 (94.74)	93 (98.94)	0.21
	No	6 (3.17)	5 (5.26)	1 (1.06)	

MRD, minimal residual disease

eTable 8. Multivariable Cox Proportional Hazards Regression Analysis of Event-Free Survival Among As-Treated Patients With Treatment Abandonment and Refusal of Protocol Treatment Considered as Adverse Events

Factor	Category	n* (%)	HR	95% CI	*P* value
Tyrosine kinase inhibitor					
	Dasatinib	93 (50.82)			
	Imatinib	90 (49.18)	2.67	1.45~4.91	0.002
Age	1 to 9	123 (67.21)			
	≥ 10	60 (32.79)	1.44	0.80~2.59	0.23
Leukocyte count at diagnosis ($\times 10^3/\mu L$)					
	<100	105 (57.38)			
	≥100	78 (42.62)	2.23	1.23~4.02	0.008
CNS status	CNS1	164 (89.62)			
	CNS2/Traumatic lumbar puncture	13 (7.10)	0.33	0.09~1.19	0.09
	CNS3	6 (3.28)	1.63	0.53~4.95	0.39
Lineage	B	179 (97.81)			
	T	4 (2.19)	8.25	2.09~32.62	0.003
Final risk	Intermediate	178 (97.27)			
	High	5 (2.73)	1.94	0.57~6.58	0.29
MRD, day 19	<5%	156 (85.25)			
	≥5%	27 (14.75)	0.65	0.28~1.53	0.32
MRD, day 46	<0.01%	144 (78.69)			
	≥0.01%	39 (21.31)	2.86	1.35~6.04	0.006

* The single infant in the imatinib group and 5 patients without MRD results at day 46 were excluded; CNS, central-nervous-system; MRD, minimal residual disease

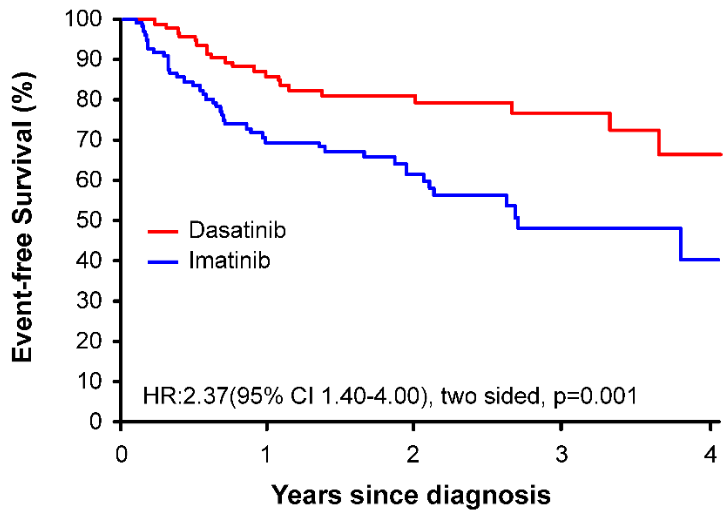
eTable 9. Comparison of Toxicity Between Patients As-Treated With Dasatinib or Imatinib

Toxicity	Imatinib n=95 (%)	Dasatinib n=94 (%)	*P* value
Grade 5 (fatal) infection	5(5.26)	5(5.32)	0.99
Grade 3/4 infection	26 (27.4)	24 (25.5)	0.87
Disseminated fungal infection	7 (7.37)	7 (7.45)	0.99
Pancreatitis	8 (8.42)	8 (8.51)	0.99
Seizure	4 (4.21)	4 (4.26)	0.99
Thrombosis	1 (1.05)	1 (1.06)	0.99
Intestinal hemorrhage	1 (1.05)	2 (2.13)	0.62
Pleural effusion	2 (2.11)	4 (4.26)	0.44
Hyperbilirubinemia	1 (1.05)	1 (1.06)	0.99

eFigure 1. Survival by As-Treated Groups

(A) Event-free survival. (B) Overall survival. The hazard ratio (HR) and confidence interval, along with the P value were obtained from Cox regression modeling.

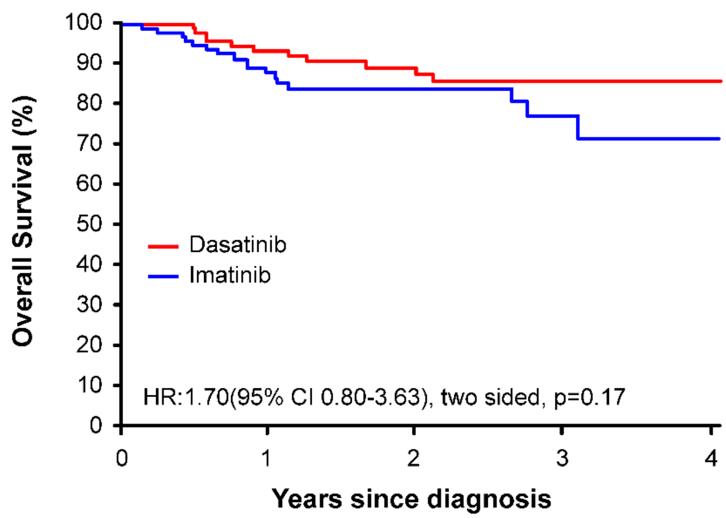
A



Number at risk

Dasatinib	94	72	46	22	6
Imatinib	95	61	40	10	0

B

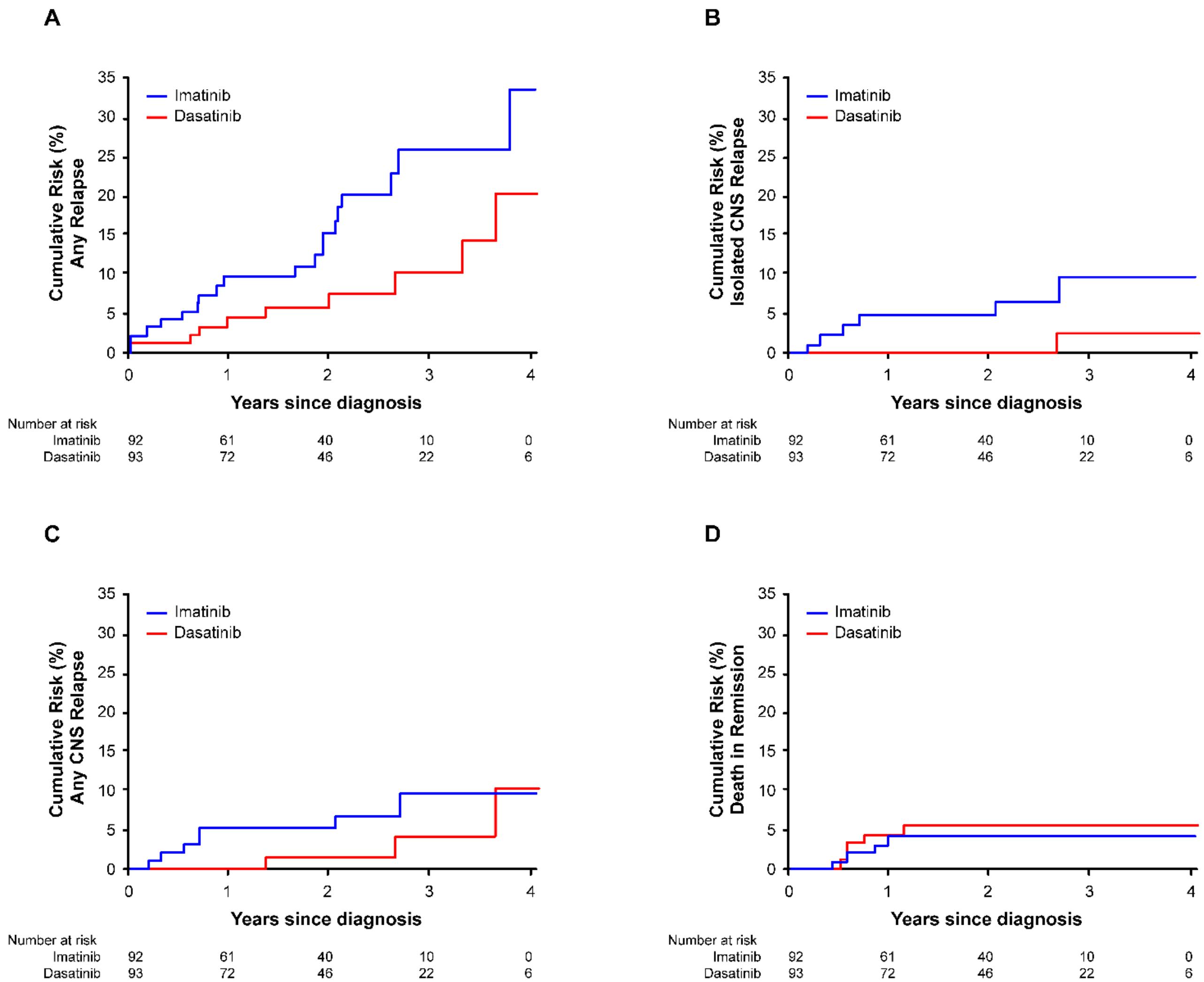


Number at risk

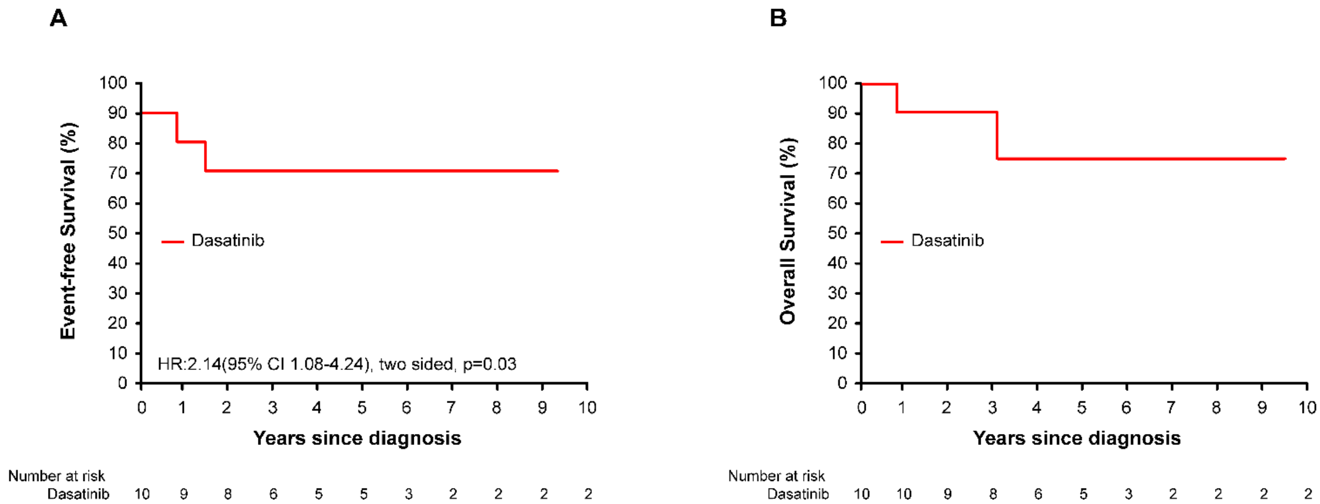
Dasatinib	94	77	50	23	7
Imatinib	95	72	48	13	0

eFigure 2. Cumulative Risk by As-Treated Groups

(A) Any relapse. (B) Isolated CNS relapse. (C) Any CNS relapse (isolated plus combined with hematologic). (D) Death in remission. CNS, central nervous system.



eFigure 3. Event-Free Survival (A) and Overall Survival (B) of Patients Treated in St. Jude Total XVI Study



eAppendix. Run-time Printout Log

```
Call:
survdiff(formula = data1 ~ cccg1$IGroup)

               N Observed Expected (O-E)^2/E (O-E)^2/V
cccg1$IGroup=1 92       15     24.3      3.54      7.77
cccg1$IGroup=2 97       30     20.7      4.15      7.77

 Chisq= 7.8  on 1 degrees of freedom, p= 0.005
-----------------------------------------------------
Call: survfit(formula = data1 ~ cccg1$IGroup)

                cccg1$IGroup=1
  time n.risk n.event survival std.err lower 95% CI upper 95% CI
 0.375     89       1    0.989  0.0112        0.967        1.000
 0.479     88       1    0.978  0.0157        0.947        1.000
 0.485     87       1    0.966  0.0191        0.930        1.000
 0.537     86       1    0.955  0.0220        0.913        0.999
 0.553     85       2    0.933  0.0266        0.882        0.986
 0.679     83       1    0.921  0.0285        0.867        0.979
 0.728     82       1    0.910  0.0303        0.853        0.972
 1.109     68       1    0.897  0.0327        0.835        0.963
 1.328     63       1    0.882  0.0351        0.816        0.954
 1.892     49       1    0.864  0.0388        0.792        0.944
 1.958     48       1    0.846  0.0419        0.768        0.933
 2.601     29       1    0.817  0.0496        0.726        0.921
 3.258     19       1    0.774  0.0629        0.660        0.908
 3.584     12       1    0.710  0.0845        0.562        0.896

                cccg1$IGroup=2
  time n.risk n.event survival std.err lower 95% CI upper 95% CI
 0.120     96       1    0.990  0.0104        0.969        1.000
 0.142     94       1    0.979  0.0147        0.951        1.000
 0.167     91       1    0.968  0.0180        0.934        1.000
 0.205     90       1    0.958  0.0208        0.918        0.999
 0.298     88       1    0.947  0.0232        0.902        0.993
 0.301     86       1    0.936  0.0254        0.887        0.987
 0.410     83       1    0.924  0.0275        0.872        0.980
 0.515     81       1    0.913  0.0294        0.857        0.973
 0.550     80       1    0.902  0.0312        0.842        0.965
 0.589     79       1    0.890  0.0328        0.828        0.957
 0.597     78       1    0.879  0.0343        0.814        0.949
 0.621     77       1    0.867  0.0357        0.800        0.940
 0.646     76       1    0.856  0.0370        0.786        0.932
 0.665     74       1    0.844  0.0383        0.773        0.923
 0.674     73       1    0.833  0.0395        0.759        0.914
 0.827     69       1    0.821  0.0407        0.745        0.905
 0.854     66       1    0.808  0.0420        0.730        0.895
 0.928     64       1    0.796  0.0432        0.715        0.885
 0.953     63       2    0.770  0.0453        0.686        0.865
 1.350     52       1    0.756  0.0468        0.669        0.853
 1.615     50       1    0.740  0.0483        0.652        0.841
 1.815     44       1    0.724  0.0500        0.632        0.829
 1.889     43       1    0.707  0.0516        0.613        0.816
 2.012     39       1    0.689  0.0534        0.592        0.802
 2.045     36       1    0.670  0.0552        0.570        0.787
```

2.081	34	1	0.650	0.0570	0.547	0.772

```
 2.560     21       1    0.619  0.0621        0.508        0.753
 2.639     19       1    0.586  0.0668        0.469        0.733
 3.729      6       1    0.489  0.1052        0.320        0.745

Call:
coxph(formula = data1 ~ as.factor(cccg1$IGroup))

  n= 189, number of events= 45

                           coef exp(coef) se(coef)      z Pr(>|z|)
as.factor(cccg1$IGroup)2 0.8594    2.3618   0.3178 2.705  0.00684 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

                         exp(coef) exp(-coef) lower .95 upper .95
as.factor(cccg1$IGroup)2     2.362     0.4234     1.267     4.403

Concordance= 0.607  (se = 0.037 )
Likelihood ratio test= 7.82 on 1 df, p=0.005
Wald test            = 7.31  on 1 df,   p=0.007
Score (logrank) test = 7.76  on 1 df,   p=0.005

====================================================
Call:
survdiff(formula = data1 ~ cccg1$IGroup)

                 N Observed Expected (O-E)^2/E (O-E)^2/V
cccg1$IGroup=1 92        9     14.4      2.05      4.26
cccg1$IGroup=2 97       19     13.6      2.19      4.26

 Chisq= 4.3  on 1 degrees of freedom, p= 0.04
--------------------------------------------------
Call: survfit(formula = data1 ~ cccg1$IGroup)

                cccg1$IGroup=1
  time n.risk n.event survival std.err lower 95% CI upper 95% CI
 0.476     92       1    0.989  0.0108        0.968        1.000
 0.485     91       1    0.978  0.0152        0.949        1.000
 0.553     88       2    0.956  0.0215        0.915        0.999
 0.728     86       1    0.945  0.0240        0.899        0.993
 0.871     80       1    0.933  0.0264        0.883        0.986
 1.109     72       1    0.920  0.0290        0.865        0.979
 1.958     53       1    0.903  0.0333        0.840        0.970
 2.075     48       1    0.884  0.0375        0.813        0.961

                cccg1$IGroup=2
  time n.risk n.event survival std.err lower 95% CI upper 95% CI
 0.120     97       1    0.990  0.0103        0.970        1.000
 0.227     94       1    0.979  0.0146        0.951        1.000
 0.389     92       1    0.969  0.0179        0.934        1.000
 0.410     90       1    0.958  0.0207        0.918        0.999
 0.463     89       1    0.947  0.0231        0.903        0.993
 0.550     88       1    0.936  0.0252        0.888        0.987
 0.627     85       1    0.925  0.0272        0.873        0.980
 0.745     83       1    0.914  0.0291        0.859        0.973
 0.827     79       1    0.903  0.0309        0.844        0.965
```

```
 0.830     78       1    0.891  0.0326        0.829        0.957
 0.953     74       1    0.879  0.0343        0.814        0.949
 1.010     72       1    0.867  0.0360        0.799        0.940
 1.024     71       1    0.854  0.0375        0.784        0.931
 1.103     68       1    0.842  0.0390        0.769        0.922
 1.227     66       1    0.829  0.0404        0.754        0.912
 1.629     57       1    0.815  0.0422        0.736        0.902
 2.595     28       1    0.786  0.0497        0.694        0.889
 2.700     22       1    0.750  0.0589        0.643        0.875
 3.036     13       1    0.692  0.0776        0.556        0.862

Call:
coxph(formula = data1 ~ as.factor(cccg1$IGroup))

  n= 189, number of events= 28

                           coef exp(coef) se(coef)     z Pr(>|z|)
as.factor(cccg1$IGroup)2 0.8132    2.2552   0.4053 2.007   0.0448 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

                         exp(coef) exp(-coef) lower .95 upper .95
as.factor(cccg1$IGroup)2     2.255     0.4434     1.019     4.991

Concordance= 0.589 (se = 0.047 )
Likelihood ratio test= 4.33 on 1 df, p=0.04
Wald test            = 4.03  on 1 df,   p=0.04
Score (logrank) test = 4.25  on 1 df,   p=0.04

==================================================


Tests:
      stat         pv df
1 6.092139 0.01357846 1
2 3.088889 0.07882861 1
Estimates and Variances:
$est
             1         2          3         4
1 1 0.02173913 0.0690390 0.09651195 0.1977281
2 1 0.11607106 0.1587490 0.26274427        NA
1 2 0.10941076 0.1342453 0.13424533 0.1342453
2 2 0.19727191 0.2227214 0.24980219        NA

$var
              1           2           3           4
1 1 0.0002338391 0.000943900 0.001643225 0.006361127
2 1 0.0011006105 0.001586525 0.003295212          NA
1 2 0.0010799721 0.001324830 0.001324830 0.001324830
2 2 0.0016679852 0.001883047 0.002493000          NA

$est
          3.9
1 1 0.1977281
2 1 0.3439865
1 2 0.1342453
```

```
2 2 0.2498022

$var
          3.9
1 1 0.006361127
2 1 0.009170958
1 2 0.001324830
2 2 0.002493000

      stat         pv df
1 6.092139 0.01357846 1
2 3.088889 0.07882861 1
----------------------------------------------------------------
Tests:
      stat          pv df
1 3.452751 0.063146602 1
2 6.778150 0.009228051 1
Estimates and Variances:
$est
           1          2          3          4
1 1 0.00000000 0.00000000 0.02747295 0.02747295
2 1 0.04123711 0.04123711 0.08417760         NA
1 2 0.13114989 0.20328432 0.20328432 0.30450047
2 2 0.27210586 0.34023333 0.42836887         NA

$var
             1            2            3            4
1 1 0.0000000000 0.0000000000 0.0007572123 0.0007572123
2 1 0.0004125514 0.0004125514 0.0013565229           NA
1 2 0.0012615178 0.0020596686 0.0020596686 0.0066480895
2 2 0.0021110864 0.0025991931 0.0038150089           NA

$est
         3.9
1 1 0.02747295
2 1 0.08417760
1 2 0.30450047
2 2 0.50961112

$var
           3.9
1 1 0.0007572123
2 1 0.0013565229
1 2 0.0066480895
2 2 0.0094149955

      stat          pv df
1 3.452751 0.063146602 1
2 6.778150 0.009228051 1
----------------------------------------------------------------
Tests:
      stat          pv df
1 1.662040 0.197328158 1
2 7.623387 0.005761619 1
Estimates and Variances:
$est
```

```
            1          2          3         4
1 1 0.00000000 0.01339707 0.04087003 0.1015997
2 1 0.05154639 0.05154639 0.09448688        NA
1 2 0.13114989 0.18988725 0.18988725 0.2303737
2 2 0.26179659 0.32992405 0.41805959        NA

$var
             1            2            3           4
1 1 0.000000000 0.0001798581 0.0009267419 0.004511714
2 1 0.000510276 0.0005102760 0.0014449927          NA
1 2 0.001261518 0.0019400008 0.0019400008 0.003392454
2 2 0.002060820 0.0025636096 0.0037984207          NA

$est
          3.9
1 1 0.10159971
2 1 0.09448688
1 2 0.23037371
2 2 0.49930184

$var
           3.9
1 1 0.004511714
2 1 0.001444993
1 2 0.003392454
2 2 0.009415917

      stat          pv df
1 1.662040 0.197328158 1
2 7.623387 0.005761619 1
-----------------------------------------------------------------
Tests:
        stat           pv df
1  0.1760269 0.6748101099 1
2 13.3892197 0.0002530747 1
Estimates and Variances:
$est
            1          2          3          4
1 1 0.04347826 0.05607551 0.05607551 0.05607551
2 1 0.04263274 0.04263274 0.04263274         NA
1 2 0.08767162 0.14720882 0.17468177 0.27589792
2 2 0.27071024 0.33883770 0.46991373         NA

$var
              1            2            3            4
1 1 0.0004574444 0.0006043831 0.0006043831 0.0006043831
2 1 0.0004420096 0.0004420096 0.0004420096           NA
1 2 0.0008878914 0.0016400244 0.0022905019 0.0068284409
2 2 0.0020902526 0.0025831148 0.0042369478           NA

$est
          3.9
1 1 0.05607551
2 1 0.04263274
1 2 0.27589792
2 2 0.55115598
```

```
$var
           3.9
1 1 0.0006043831
2 1 0.0004420096
1 2 0.0068284409
2 2 0.0096140089

        stat          pv df
1  0.1760269 0.6748101099 1
2 13.3892197 0.0002530747 1
================================================================================


Call:
survdiff(formula = data1 ~ cccg1$AGroup)

                N Observed Expected (O-E)^2/E (O-E)^2/V
cccg1$AGroup=1 94       21     34.1      5.01        11
cccg1$AGroup=2 95       42     28.9      5.89        11

 Chisq= 11  on 1 degrees of freedom, p= 9e-04
------------------------------------------------------------------
Call: survfit(formula = data1 ~ cccg1$AGroup)

                cccg1$AGroup=1
  time n.risk n.event survival std.err lower 95% CI upper 95% CI
 0.205     94       1    0.989  0.0106        0.969        1.000
 0.285     93       1    0.979  0.0149        0.950        1.000
 0.364     92       1    0.968  0.0181        0.933        1.000
 0.375     91       1    0.957  0.0208        0.917        0.999
 0.479     90       1    0.947  0.0231        0.903        0.993
 0.485     89       1    0.936  0.0252        0.888        0.987
 0.553     88       2    0.915  0.0288        0.860        0.973
 0.589     86       1    0.904  0.0303        0.847        0.966
 0.679     85       1    0.894  0.0318        0.833        0.958
 0.728     84       1    0.883  0.0332        0.820        0.950
 0.871     77       1    0.872  0.0347        0.806        0.942
 0.953     74       1    0.860  0.0361        0.792        0.934
 1.040     71       1    0.848  0.0376        0.777        0.925
 1.046     70       1    0.836  0.0390        0.763        0.915
 1.109     67       1    0.823  0.0403        0.748        0.906
 1.328     61       1    0.810  0.0419        0.732        0.896
 1.958     48       1    0.793  0.0443        0.711        0.884
 2.601     30       1    0.766  0.0500        0.674        0.871
 3.258     19       1    0.726  0.0616        0.615        0.857
 3.584     12       1    0.665  0.0809        0.524        0.844

                cccg1$AGroup=2
   time n.risk n.event survival std.err lower 95% CI upper 95% CI
 0.0876     95       1    0.989  0.0105        0.969        1.000
 0.1205     94       1    0.979  0.0147        0.951        1.000
 0.1369     93       1    0.968  0.0179        0.934        1.000
 0.1424     92       1    0.958  0.0206        0.918        0.999
 0.1533     91       1    0.947  0.0229        0.904        0.993
 0.1615     90       1    0.937  0.0250        0.889        0.987
```

0.1670	89	1	0.926	0.0268	0.875	0.980
0.2053	88	1	0.916	0.0285	0.862	0.973
0.2656	87	1	0.905	0.0300	0.848	0.966
0.2984	86	2	0.884	0.0328	0.822	0.951
0.3012	84	1	0.874	0.0341	0.809	0.943
0.3094	83	1	0.863	0.0353	0.797	0.935
0.3614	82	1	0.853	0.0364	0.784	0.927
0.4100	81	1	0.842	0.0374	0.772	0.919
0.4627	80	1	0.832	0.0384	0.760	0.910
0.5147	79	1	0.821	0.0393	0.747	0.902
0.5366	78	1	0.811	0.0402	0.735	0.893
0.5503	77	1	0.800	0.0410	0.723	0.885
0.5969	76	1	0.789	0.0418	0.712	0.876
0.6215	75	1	0.779	0.0426	0.700	0.867
0.6461	74	1	0.768	0.0433	0.688	0.858
0.6626	73	1	0.758	0.0439	0.676	0.849
0.6653	72	1	0.747	0.0446	0.665	0.840
0.6735	71	1	0.737	0.0452	0.653	0.831
0.8268	68	1	0.726	0.0458	0.642	0.822
0.8542	65	1	0.715	0.0464	0.629	0.812
0.9281	63	1	0.703	0.0471	0.617	0.802
0.9528	62	1	0.692	0.0477	0.605	0.792
1.3142	57	1	0.680	0.0483	0.592	0.782
1.3498	55	1	0.668	0.0490	0.578	0.771
1.6153	52	1	0.655	0.0497	0.564	0.760
1.8152	45	1	0.640	0.0507	0.548	0.748
1.8891	44	1	0.626	0.0516	0.532	0.735
1.8919	43	1	0.611	0.0524	0.517	0.723
2.0123	39	1	0.595	0.0534	0.500	0.710
2.0452	36	1	0.579	0.0544	0.482	0.696
2.0808	33	1	0.561	0.0555	0.463	0.681
2.5599	20	1	0.533	0.0594	0.429	0.663
2.6201	19	1	0.505	0.0625	0.396	0.644
2.6393	18	1	0.477	0.0651	0.365	0.623
3.7290	6	1	0.398	0.0906	0.254	0.622

```
Call:
coxph(formula = data1 ~ as.factor(cccg1$AGroup))

  n= 189, number of events= 63

                           coef exp(coef) se(coef)     z Pr(>|z|)
as.factor(cccg1$AGroup)2 0.8622    2.3684   0.2683 3.214  0.00131 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

                         exp(coef) exp(-coef) lower .95 upper .95
as.factor(cccg1$AGroup)2     2.368     0.4222       1.4     4.007

Concordance= 0.605  (se = 0.031 )
Likelihood ratio test= 11.05 on 1 df, p=9e-04
Wald test            = 10.33  on 1 df,   p=0.001
Score (logrank) test = 10.97  on 1 df,   p=9e-04

=================================================================
Call:
```

```
survdiff(formula = data1 ~ cccg1$AGroup)

                N Observed Expected (O-E)^2/E (O-E)^2/V
cccg1$AGroup=1 94       11     14.7     0.913      1.92
cccg1$AGroup=2 95       17     13.3     1.003      1.92

 Chisq= 1.9  on 1 degrees of freedom, p= 0.2
-----------------------------------------------------------
Call: survfit(formula = data1 ~ cccg1$AGroup)

                cccg1$AGroup=1
  time n.risk n.event survival std.err lower 95% CI upper 95% CI
 0.476     94       1    0.989  0.0106        0.969        1.000
 0.485     93       1    0.979  0.0149        0.950        1.000
 0.553     90       2    0.957  0.0210        0.917        0.999
 0.728     88       1    0.946  0.0235        0.901        0.993
 0.871     81       1    0.934  0.0259        0.885        0.987
 1.109     73       1    0.922  0.0285        0.867        0.979
 1.227     68       1    0.908  0.0312        0.849        0.971
 1.629     58       1    0.892  0.0343        0.828        0.962
 1.958     52       1    0.875  0.0377        0.804        0.952
 2.075     48       1    0.857  0.0411        0.780        0.942

                cccg1$AGroup=2
  time n.risk n.event survival std.err lower 95% CI upper 95% CI
 0.120     95       1    0.989  0.0105        0.969        1.000
 0.227     92       1    0.979  0.0149        0.950        1.000
 0.389     90       1    0.968  0.0183        0.933        1.000
 0.410     88       1    0.957  0.0211        0.916        0.999
 0.463     87       1    0.946  0.0236        0.901        0.993
 0.550     86       1    0.935  0.0257        0.886        0.987
 0.627     83       1    0.924  0.0278        0.871        0.980
 0.745     81       1    0.912  0.0297        0.856        0.972
 0.827     78       1    0.900  0.0315        0.841        0.964
 0.830     77       1    0.889  0.0332        0.826        0.956
 0.953     73       1    0.877  0.0349        0.811        0.948
 1.010     72       1    0.864  0.0365        0.796        0.939
 1.024     71       1    0.852  0.0380        0.781        0.930
 1.103     67       1    0.840  0.0395        0.766        0.921
 2.595     27       1    0.808  0.0487        0.718        0.910
 2.700     21       1    0.770  0.0597        0.661        0.896
 3.036     13       1    0.711  0.0792        0.571        0.884

Call:
coxph(formula = data1 ~ as.factor(cccg1$AGroup))

  n= 189, number of events= 28

                           coef exp(coef) se(coef)     z Pr(>|z|)
as.factor(cccg1$AGroup)2 0.5307    1.7001   0.3876 1.369    0.171

                         exp(coef) exp(-coef) lower .95 upper .95
as.factor(cccg1$AGroup)2       1.7     0.5882    0.7954     3.634

Concordance= 0.563 (se = 0.048 )
Likelihood ratio test= 1.93  on 1 df,  p=0.2
```

```
Wald test            = 1.87  on 1 df,   p=0.2
Score (logrank) test = 1.92  on 1 df,   p=0.2

==================================================================


Tests:
      stat         pv df
1 4.315720 0.03776180 1
2 5.001809 0.02532084 1
Estimates and Variances:
$est
             1          2         3         4
1 1 0.04369208 0.07448402 0.1012844 0.2035491
2 1 0.09620015 0.15269252 0.2585863        NA
1 2 0.09657364 0.12150410 0.1215041 0.1215041
2 2 0.21165621 0.23616274 0.2642322        NA

$var
               1            2           3           4
1 1 0.0004632928 0.0009076806 0.001574214 0.006410207
2 1 0.0009434105 0.0015924069 0.003391088          NA
1 2 0.0009484131 0.0012035218 0.001203522 0.001203522
2 2 0.0017911360 0.0019774931 0.002629488          NA

$est
          3.9
1 1 0.2035491
2 1 0.3381165
1 2 0.1215041
2 2 0.2642322

$var
            3.9
1 1 0.006410207
2 1 0.008979540
1 2 0.001203522
2 2 0.002629488

      stat         pv df
1 4.315720 0.03776180 1
2 5.001809 0.02532084 1
------------------------------------------------------------------
Tests:
      stat          pv df
1 3.647831 0.056142290 1
2 7.283900 0.006957533 1
Estimates and Variances:
$est
             1          2          3         4
1 1 0.00000000 0.00000000 0.02680040 0.0268004
2 1 0.04210526 0.04210526 0.08584514        NA
1 2 0.14026571 0.19598812 0.19598812 0.2982528
2 2 0.26575110 0.34675000 0.43697338        NA

$var
```

```
              1            2            3            4
1 1 0.0000000000 0.0000000000 0.000720385 0.000720385
2 1 0.0004298454 0.0004298454 0.001421635          NA
1 2 0.0013206589 0.0019113941 0.001911394 0.006639451
2 2 0.0021085923 0.0026716960 0.003947729          NA

$est
          3.9
1 1 0.02680040
2 1 0.08584514
1 2 0.29825279
2 2 0.51650363

$var
           3.9
1 1 0.000720385
2 1 0.001421635
1 2 0.006639451
2 2 0.009242098

      stat          pv df
1 3.647831 0.056142290 1
2 7.283900 0.006957533  1
-------------------------------------------------------
Tests:
      stat         pv df
1 1.761722 0.18440986 1
2 8.182802 0.00422894 1
Estimates and Variances:
$est
            1          2          3         4
1 1 0.00000000 0.01368531 0.04048570 0.1018445
2 1 0.05263158 0.05263158 0.09637146        NA
1 2 0.14026571 0.18230281 0.18230281 0.2232087
2 2 0.25522479 0.33622368 0.42644707        NA

$var
              1            2            3            4
1 1 0.0000000000 0.0001877046 0.000897497 0.004561692
2 1 0.0005315467 0.0005315467 0.001513504          NA
1 2 0.0013206589 0.0017813208 0.001781321 0.003283223
2 2 0.0020547095 0.0026360206 0.003932335          NA

$est
          3.9
1 1 0.10184451
2 1 0.09637146
1 2 0.22320868
2 2 0.50597731

$var
           3.9
1 1 0.004561692
2 1 0.001513504
1 2 0.003283223
2 2 0.009244581
```

```
      stat        pv df
1 1.761722 0.18440986 1
2 8.182802 0.00422894 1
-----------------------------------------------------------
Tests:
        stat          pv df
1  0.1384293 0.7098475188 1
2 14.0968484 0.0001736345 1
Estimates and Variances:
$est
           1          2          3          4
1 1 0.04255319 0.05520173 0.05520173 0.05520173
2 1 0.04323516 0.04323516 0.04323516         NA
1 2 0.09771252 0.14078639 0.16758678 0.26985145
2 2 0.26462121 0.34562010 0.47958336         NA

$var
             1            2            3            4
1 1 0.0004384597 0.0005871797 0.0005871797 0.0005871797
2 1 0.0004542231 0.0004542231 0.0004542231           NA
1 2 0.0009716645 0.0014946012 0.0021210257 0.0068039726
2 2 0.0020908775 0.0026590722 0.0043854500           NA

$est
          3.9
1 1 0.05520173
2 1 0.04323516
1 2 0.26985145
2 2 0.55911361

$var
            3.9
1 1 0.0005871797
2 1 0.0004542231
1 2 0.0068039726
2 2 0.0094457358

        stat          pv df
1  0.1384293 0.7098475188 1
2 14.0968484 0.0001736345 1
=====================================================================
```

Table 1:

```
Call:
coxph(formula = data9 ~ as.factor(cccg2$IGROUP) + as.factor(cccg2$AGE) +
    as.factor(cccg2$"WBC(100)") + as.factor(cccg2$CNSL) + as.factor(cccg2$"D19MRD(5)") +
    as.factor(cccg2$"D46MRD(%)") + as.factor(cccg2$BT) + as.factor(cccg2$FRisk))

  n= 183, number of events= 44

                               coef exp(coef) se(coef)      z Pr(>|z|)
as.factor(cccg2$IGROUP)2       1.0235    2.7830   0.3605  2.840 0.004518 **
as.factor(cccg2$AGE)3          0.7041    2.0220   0.3460  2.035 0.041851 *
as.factor(cccg2$"WBC(100)")2   1.4227    4.1484   0.3677  3.869 0.000109 ***
```

```
as.factor(cccg2$CNSL)2        -1.2166    0.2962   0.7260 -1.676 0.093790 .
as.factor(cccg2$CNSL)3         0.1776    1.1944   0.6429  0.276 0.782340
as.factor(cccg2$"D19MRD(5)")4 -0.2889    0.7491   0.5141 -0.562 0.574131
as.factor(cccg2$"D46MRD(%)")2  0.7267    2.0683   0.4606  1.578 0.114584
as.factor(cccg2$BT)2           3.0307   20.7113   0.7856  3.858 0.000114 ***
as.factor(cccg2$FRisk)2        1.1438    3.1388   0.6772  1.689 0.091216 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

                              exp(coef) exp(-coef) lower .95 upper .95
as.factor(cccg2$IGROUP)2         2.7830    0.35932   1.37306     5.641
as.factor(cccg2$AGE)3            2.0220    0.49456   1.02630     3.984
as.factor(cccg2$"WBC(100)")2     4.1484    0.24106   2.01769     8.529
as.factor(cccg2$CNSL)2           0.2962    3.37572   0.07139     1.229
as.factor(cccg2$CNSL)3           1.1944    0.83726   0.33876     4.211
as.factor(cccg2$"D19MRD(5)")4    0.7491    1.33499   0.27347     2.052
as.factor(cccg2$"D46MRD(%)")2    2.0683    0.48349   0.83866     5.101
as.factor(cccg2$BT)2            20.7113    0.04828   4.44093    96.592
as.factor(cccg2$FRisk)2          3.1388    0.31860   0.83236    11.836

Concordance= 0.781  (se = 0.039 )
Likelihood ratio test= 50.25 on 9 df, p=1e-07
Wald test            = 47.53  on 9 df,   p=3e-07
Score (logrank) test = 62.81  on 9 df,   p=4e-10

================================================================
```

eTable 5, Imatinib

```
Call:
coxph(formula = data ~ as.factor(cccg1I$AGE))

  n= 96, number of events= 30
   (1 observation deleted due to missingness)

                        coef exp(coef) se(coef)     z Pr(>|z|)
as.factor(cccg1I$AGE)3 0.8884    2.4312   0.3784 2.348   0.0189 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

                       exp(coef) exp(-coef) lower .95 upper .95
as.factor(cccg1I$AGE)3     2.431     0.4113     1.158     5.104

Concordance= 0.599 (se = 0.047 )
Likelihood ratio test= 5.32 on 1 df, p=0.02
Wald test            = 5.51  on 1 df,   p=0.02
Score (logrank) test = 5.86  on 1 df,   p=0.02

Call:
coxph(formula = data ~ as.factor(cccg1I$SEX))

  n= 97, number of events= 30

                         coef exp(coef) se(coef)      z Pr(>|z|)
as.factor(cccg1I$SEX)2 -0.4545    0.6348   0.4041 -1.125    0.261
```

```
                       exp(coef) exp(-coef) lower .95 upper .95
as.factor(cccg1I$SEX)2    0.6348      1.575    0.2875     1.402

Concordance= 0.542 (se = 0.045 )
Likelihood ratio test= 1.19 on 1 df, p=0.3
Wald test            = 1.26  on 1 df,   p=0.3
Score (logrank) test = 1.29  on 1 df,   p=0.3

Call:
coxph(formula = data ~ as.factor(cccg1I$"WBC(100)"))

  n= 97, number of events= 30

                               coef exp(coef) se(coef)     z Pr(>|z|)
as.factor(cccg1I$"WBC(100)")2 1.235     3.438    0.402 3.072  0.00213 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

                              exp(coef) exp(-coef) lower .95 upper .95
as.factor(cccg1I$"WBC(100)")2     3.438     0.2909     1.564      7.56

Concordance= 0.658  (se = 0.046 )
Likelihood ratio test= 10.51 on 1 df, p=0.001
Wald test            = 9.44  on 1 df,   p=0.002
Score (logrank) test = 10.64  on 1 df,   p=0.001

Call:
coxph(formula = data ~ as.factor(cccg1I$CNSL))

  n= 97, number of events= 30

                          coef exp(coef) se(coef)     z Pr(>|z|)
as.factor(cccg1I$CNSL)2 0.3978    1.4885   0.6127 0.649    0.516
as.factor(cccg1I$CNSL)3 0.5638    1.7573   1.0260 0.549    0.583

                        exp(coef) exp(-coef) lower .95 upper .95
as.factor(cccg1I$CNSL)2     1.489     0.6718    0.4480     4.946
as.factor(cccg1I$CNSL)3     1.757     0.5690    0.2352    13.129

Concordance= 0.526 (se = 0.032 )
Likelihood ratio test= 0.61 on 2 df, p=0.7
Wald test            = 0.68  on 2 df,   p=0.7
Score (logrank) test = 0.69  on 2 df,   p=0.7

Call:
coxph(formula = data ~ as.factor(cccg1I$BT))

  n= 97, number of events= 30

                        coef exp(coef) se(coef)     z Pr(>|z|)
as.factor(cccg1I$BT)2  2.4236   11.2859   0.7617 3.182  0.00146 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

                      exp(coef) exp(-coef) lower .95 upper .95
as.factor(cccg1I$BT)2     11.29    0.08861     2.536     50.22
```

```
Concordance= 0.54  (se = 0.027 )
Likelihood ratio test= 5.8 on 1 df, p=0.02
Wald test            = 10.12  on 1 df,   p=0.001
Score (logrank) test = 16.14  on 1 df,   p=6e-05

Call:
coxph(formula = data ~ as.factor(cccg1I$"P190/210"))

  n= 79, number of events= 24
   (18 observations deleted due to missingness)

                                    coef exp(coef) se(coef)      z Pr(>|z|)
as.factor(cccg1I$"P190/210")P210 -0.3376    0.7135   0.6191 -0.545    0.586

                                 exp(coef) exp(-coef) lower .95 upper .95
as.factor(cccg1I$"P190/210")P210    0.7135      1.402    0.2121     2.401

Concordance= 0.516 (se = 0.039 )
Likelihood ratio test= 0.32 on 1 df, p=0.6
Wald test            = 0.3  on 1 df,   p=0.6
Score (logrank) test = 0.3  on 1 df,   p=0.6

Call:
coxph(formula = data ~ as.factor(cccg1I$FRisk))

  n= 97, number of events= 30

                          coef exp(coef) se(coef)    z Pr(>|z|)
as.factor(cccg1I$FRisk)2 1.1210    3.0680   0.6195 1.81   0.0704 .
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

                         exp(coef) exp(-coef) lower .95 upper .95
as.factor(cccg1I$FRisk)2     3.068     0.3259    0.9111     10.33

Concordance= 0.545 (se = 0.032 )
Likelihood ratio test= 2.48 on 1 df, p=0.1
Wald test            = 3.27  on 1 df,   p=0.07
Score (logrank) test = 3.61  on 1 df,   p=0.06

Call:
coxph(formula = data ~ as.factor(cccg1I$"D19MRD(5)"))

  n= 96, number of events= 30
   (1 observation deleted due to missingness)

                                  coef exp(coef) se(coef)     z Pr(>|z|)
as.factor(cccg1I$"D19MRD(5)")4 0.7916    2.2070   0.3996 1.981   0.0476 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

                               exp(coef) exp(-coef) lower .95 upper .95
as.factor(cccg1I$"D19MRD(5)")4     2.207     0.4531     1.008      4.83

Concordance= 0.562  (se = 0.041 )
```

```
Likelihood ratio test= 3.48 on 1 df, p=0.06
Wald test            = 3.92  on 1 df,   p=0.05
Score (logrank) test = 4.13  on 1 df,   p=0.04

Call:
coxph(formula = data ~ as.factor(cccg1I$"D46MRD(%)"))

  n= 93, number of events= 29
   (4 observations deleted due to missingness)

                                  coef exp(coef) se(coef)     z Pr(>|z|)
as.factor(cccg1I$"D46MRD(%)")2 1.0715    2.9196   0.3935 2.723  0.00648 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

                               exp(coef) exp(-coef) lower .95 upper .95
as.factor(cccg1I$"D46MRD(%)")2      2.92     0.3425      1.35     6.314

Concordance= 0.604  (se = 0.045 )
Likelihood ratio test= 6.45 on 1 df, p=0.01
Wald test            = 7.41  on 1 df,   p=0.006
Score (logrank) test = 8.13  on 1 df,   p=0.004

--------------------------------------------------
 eTable 5, Dasatinib
Call:
coxph(formula = data ~ as.factor(cccg1D$AGE))

  n= 92, number of events= 15

                         coef exp(coef) se(coef)     z Pr(>|z|)
as.factor(cccg1D$AGE)3 0.2626    1.3003   0.5562 0.472    0.637

                       exp(coef) exp(-coef) lower .95 upper .95
as.factor(cccg1D$AGE)3       1.3      0.769    0.4371     3.868

Concordance= 0.536 (se = 0.068 )
Likelihood ratio test= 0.22 on 1 df, p=0.6
Wald test            = 0.22  on 1 df,   p=0.6
Score (logrank) test = 0.22  on 1 df,   p=0.6

Call:
coxph(formula = data ~ as.factor(cccg1D$SEX))

  n= 92, number of events= 15

                         coef exp(coef) se(coef)     z Pr(>|z|)
as.factor(cccg1D$SEX)2 0.1434    1.1541   0.5858 0.245    0.807

                       exp(coef) exp(-coef) lower .95 upper .95
as.factor(cccg1D$SEX)2     1.154     0.8664    0.3661     3.638

Concordance= 0.505 (se = 0.063 )
Likelihood ratio test= 0.06 on 1 df, p=0.8
Wald test            = 0.06  on 1 df,   p=0.8
Score (logrank) test = 0.06  on 1 df,   p=0.8
```

```
Call:
coxph(formula = data ~ as.factor(cccg1D$"WBC(100)"))

  n= 92, number of events= 15

                                coef exp(coef) se(coef)     z Pr(>|z|)
as.factor(cccg1D$"WBC(100)")2 1.1633    3.2004   0.5482 2.122   0.0338 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

                              exp(coef) exp(-coef) lower .95 upper .95
as.factor(cccg1D$"WBC(100)")2       3.2     0.3125     1.093     9.371

Concordance= 0.661 (se = 0.066 )
Likelihood ratio test= 4.86 on 1 df, p=0.03
Wald test            = 4.5  on 1 df,   p=0.03
Score (logrank) test = 5.03  on 1 df,   p=0.02

Call:
coxph(formula = data ~ as.factor(cccg1D$CNSL))

  n= 92, number of events= 15

                              coef  exp(coef)   se(coef)      z Pr(>|z|)
as.factor(cccg1D$CNSL)2 -1.763e+01 2.199e-08 6.010e+03 -0.003 0.9977
as.factor(cccg1D$CNSL)3  1.630e+00  5.103e+00  7.677e-01  2.123   0.0338 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

                        exp(coef) exp(-coef) lower .95 upper .95
as.factor(cccg1D$CNSL)2 2.199e-08  4.547e+07     0.000       Inf
as.factor(cccg1D$CNSL)3 5.103e+00  1.960e-01     1.133     22.98

Concordance= 0.597 (se = 0.047 )
Likelihood ratio test= 5.75 on 2 df, p=0.06
Wald test            = 4.51  on 2 df,   p=0.1
Score (logrank) test = 7.47  on 2 df,   p=0.02

Call:
coxph(formula = data ~ as.factor(cccg1D$BT))

  n= 92, number of events= 15

                       coef exp(coef) se(coef)     z Pr(>|z|)
as.factor(cccg1D$BT)2 1.811     6.115    1.047 1.729   0.0839 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

                      exp(coef) exp(-coef) lower .95 upper .95
as.factor(cccg1D$BT)2     6.115     0.1635    0.7849     47.64

Concordance= 0.54 (se = 0.044 )
Likelihood ratio test= 1.88 on 1 df, p=0.2
Wald test            = 2.99  on 1 df,   p=0.08
Score (logrank) test = 3.9  on 1 df,   p=0.05
```

```
Call:
coxph(formula = data ~ as.factor(cccg1D$"P190/210"))

  n= 72, number of events= 10
   (20 observations deleted due to missingness)

                                  coef exp(coef) se(coef)      z Pr(>|z|)
as.factor(cccg1D$"P190/210")P210 -0.5099    0.6006   1.0669 -0.478    0.633

                               exp(coef) exp(-coef) lower .95 upper .95
as.factor(cccg1D$"P190/210")P210    0.6006      1.665   0.07421      4.86

Concordance= 0.492 (se = 0.07 )
Likelihood ratio test= 0.26 on 1 df, p=0.6
Wald test            = 0.23  on 1 df,   p=0.6
Score (logrank) test = 0.23  on 1 df,   p=0.6

Call:
coxph(formula = data ~ as.factor(cccg1D$FRisk))

  n= 92, number of events= 15

                         coef exp(coef) se(coef)     z Pr(>|z|)
as.factor(cccg1D$FRisk)2  4.472    87.499    1.414 3.162  0.00157 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

                        exp(coef) exp(-coef) lower .95 upper .95
as.factor(cccg1D$FRisk)2      87.5    0.01143     5.473      1399

Concordance= 0.545 (se = 0.042 )
Likelihood ratio test= 6.22 on 1 df, p=0.01
Wald test            = 10  on 1 df,   p=0.002
Score (logrank) test = 42.75  on 1 df,   p=6e-11

Call:
coxph(formula = data ~ as.factor(cccg1D$"D19MRD(5)"))

  n= 92, number of events= 15

                                coef exp(coef) se(coef)     z Pr(>|z|)
as.factor(cccg1D$"D19MRD(5)")4 1.3461    3.8423   0.5847 2.302   0.0213 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

                              exp(coef) exp(-coef) lower .95 upper .95
as.factor(cccg1D$"D19MRD(5)")4     3.842     0.2603     1.222     12.09

Concordance= 0.581 (se = 0.059 )
Likelihood ratio test= 4.17 on 1 df, p=0.04
Wald test            = 5.3  on 1 df,   p=0.02
Score (logrank) test = 6.15  on 1 df,   p=0.01

Call:
coxph(formula = data ~ as.factor(cccg1D$"D46MRD(%)"))
```

```
  n= 91, number of events= 15
   (1 observation deleted due to missingness)

                              coef exp(coef) se(coef)     z Pr(>|z|)
as.factor(cccg1D$"D46MRD(%)")2 1.4384    4.2140   0.5196 2.768  0.00564 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

                               exp(coef) exp(-coef) lower .95 upper .95
as.factor(cccg1D$"D46MRD(%)")2     4.214     0.2373     1.522     11.67

Concordance= 0.695  (se = 0.067 )
Likelihood ratio test= 6.9 on 1 df, p=0.009
Wald test            = 7.66  on 1 df,   p=0.006
Score (logrank) test = 9.06  on 1 df,   p=0.003

==============================================================
```

eTable 3:

```
	Fisher's Exact Test for Count Data

data:  X
p-value = 0.8152
alternative hypothesis: two.sided


	Fisher's Exact Test for Count Data

data:  X
p-value = 1
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval:
 0.5146342 2.0243752
sample estimates:
odds ratio
1.021216


	Fisher's Exact Test for Count Data

data:  X
p-value = 0.1246
alternative hypothesis: two.sided


	Fisher's Exact Test for Count Data

data:  X
p-value = 1
alternative hypothesis: two.sided


	Fisher's Exact Test for Count Data
```

```
data:  X
p-value = 1
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval:
  0.07504541 14.83866993
sample estimates:
odds ratio
1.055278


        Fisher's Exact Test for Count Data

data:  X
p-value = 0.1063
alternative hypothesis: two.sided


        Fisher's Exact Test for Count Data

data:  X
p-value = 0.6567
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval:
 0.2758955 1.9721007
sample estimates:
odds ratio
0.7502786


        Fisher's Exact Test for Count Data

data:  X
p-value = 1
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval:
   0 Inf
sample estimates:
odds ratio
         0


        Fisher's Exact Test for Count Data

data:  X
p-value = 0.3692
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval:
 0.005137618 2.662555556
sample estimates:
odds ratio
0.2571258

---------------------------------------------------
 eTable 6:
```

Fisher's Exact Test for Count Data

data: X
p-value = 1
alternative hypothesis: two.sided

Fisher's Exact Test for Count Data

data: X
p-value = 0.5178
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval:
 0.391675 1.547866
sample estimates:
odds ratio
0.7813266

Fisher's Exact Test for Count Data

data: X
p-value = 0.2081
alternative hypothesis: two.sided

Fisher's Exact Test for Count Data

data: X
p-value = 0.6566
alternative hypothesis: two.sided

Fisher's Exact Test for Count Data

data: X
p-value = 0.621
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval:
 0.006220911 4.214956427
sample estimates:
odds ratio
0.3315117

Fisher's Exact Test for Count Data

data: X
p-value = 0.366
alternative hypothesis: two.sided

Fisher's Exact Test for Count Data

data: X
p-value = 0.827

```
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval:
 0.429030 3.006349
sample estimates:
odds ratio
1.126379


        Fisher's Exact Test for Count Data

data:  X
p-value = 1
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval:
   0 Inf
sample estimates:
odds ratio
         0


        Fisher's Exact Test for Count Data

data:  X
p-value = 0.3683
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval:
 0.004920413 2.549834105
sample estimates:
odds ratio
0.2462462

=================================================================


 eTable 4:

        Fisher's Exact Test for Count Data

data:  X
p-value = 0.2088
alternative hypothesis: two.sided


        Fisher's Exact Test for Count Data

data:  X
p-value = 0.5058
alternative hypothesis: two.sided


        Fisher's Exact Test for Count Data

data:  X
p-value = 0.2122
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval:
```

```
 0.004234299 1.870659217
sample estimates:
odds ratio
0.2036452

-----------------------------------------
 eTable 7:

	Fisher's Exact Test for Count Data

data:  X
p-value = 0.09088
alternative hypothesis: two.sided


	Fisher's Exact Test for Count Data

data:  X
p-value = 0.459
alternative hypothesis: two.sided


	Fisher's Exact Test for Count Data

data:  X
p-value = 0.2113
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval:
 0.004054353 1.790964692
sample estimates:
odds ratio
0.1949815

=================================================================


 eTable 8:
Call:
coxph(formula = data9 ~ as.factor(cccg2$AGROUP) + as.factor(cccg2$AGE) +
    as.factor(cccg2$"WBC(100)") + as.factor(cccg2$CNSL) + as.factor(cccg2$"D19MRD(5)") +
    as.factor(cccg2$"D46MRD(%)") + as.factor(cccg2$BT) + as.factor(cccg2$FRisk))

  n= 183, number of events= 58

                               coef exp(coef) se(coef)      z Pr(>|z|)
as.factor(cccg2$AGROUP)2       0.9804    2.6654   0.3118  3.144  0.00167 **
as.factor(cccg2$AGE)3          0.3632    1.4379   0.3001  1.210  0.22623
as.factor(cccg2$"WBC(100)")2   0.8001    2.2258   0.3018  2.651  0.00803 **
as.factor(cccg2$CNSL)2        -1.1037    0.3316   0.6531 -1.690  0.09103 .
as.factor(cccg2$CNSL)3         0.4857    1.6253   0.5683  0.855  0.39276
as.factor(cccg2$"D19MRD(5)")4 -0.4324    0.6489   0.4377 -0.988  0.32312
as.factor(cccg2$"D46MRD(%)")2  1.0508    2.8600   0.3815  2.754  0.00588 **
as.factor(cccg2$BT)2           2.1100    8.2479   0.7016  3.007  0.00263 **
as.factor(cccg2$FRisk)2        0.6606    1.9360   0.6245  1.058  0.29013
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

```
                         exp(coef) exp(-coef) lower .95 upper .95
as.factor(cccg2$AGROUP)2        2.6654     0.3752   1.44663     4.911
as.factor(cccg2$AGE)3           1.4379     0.6955   0.79849     2.589
as.factor(cccg2$"WBC(100)")2    2.2258     0.4493   1.23185     4.022
as.factor(cccg2$CNSL)2          0.3316     3.0152   0.09221     1.193
as.factor(cccg2$CNSL)3          1.6253     0.6153   0.53357     4.951
as.factor(cccg2$"D19MRD(5)")4   0.6489     1.5410   0.27520     1.530
as.factor(cccg2$"D46MRD(%)")2   2.8600     0.3497   1.35395     6.041
as.factor(cccg2$BT)2            8.2479     0.1212   2.08525    32.623
as.factor(cccg2$FRisk)2         1.9360     0.5165   0.56928     6.584

Concordance= 0.714  (se = 0.039 )
Likelihood ratio test= 43.65 on 9 df, p=2e-06
Wald test            = 42.65  on 9 df,   p=2e-06
Score (logrank) test = 51.28  on 9 df,   p=6e-08

=================================================================
```

eTable 9:

```
        Fisher's Exact Test for Count Data

data:  X
p-value = 1
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval:
 0.2193919 4.4578321
sample estimates:
odds ratio
0.9889463


        Fisher's Exact Test for Count Data

data:  X
p-value = 0.8693
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval:
 0.5470461 2.2128220
sample estimates:
odds ratio
1.098484


        Fisher's Exact Test for Count Data

data:  X
p-value = 1
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval:
 0.282847 3.455936
sample estimates:
odds ratio
0.988695
```

```
	Fisher's Exact Test for Count Data

data:  X
p-value = 1
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval:
 0.3079302 3.1734088
sample estimates:
odds ratio
0.9885651


	Fisher's Exact Test for Count Data

data:  X
p-value = 1
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval:
 0.1784304 5.4824155
sample estimates:
odds ratio
0.9890678


	Fisher's Exact Test for Count Data

data:  X
p-value = 1
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval:
  0.01248028 78.44060169
sample estimates:
odds ratio
0.9894168


	Fisher's Exact Test for Count Data

data:  X
p-value = 0.621
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval:
 0.00821465 9.58568321
sample estimates:
odds ratio
0.4911521


	Fisher's Exact Test for Count Data

data:  X
p-value = 0.4443
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval:
```

0.04293692 3.48426381
sample estimates:
odds ratio
0.4856741

Fisher's Exact Test for Count Data

data: X
p-value = 1
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval:
0.01248028 78.44060169
sample estimates:
odds ratio
0.9894168

The R Code

```
#=====================================================================================
# Based on the MS outline determined by the study PI/team in accordance with the study protocol,
# the analyses are modularized according to tables and figures. A few clean and confirmed datasets
# are generated from the master data file. In each analysis the dataset (in Excel format) for the
# module is loaded into RStudio via GUI, and the computation is carried out by "select-and-run."
# The run-time printout of function calls and results (the file 'R_code_JAMAO_logFile.txt')
# was generated by bracketing the code lines below with the pair of commands sink(file) and sink().
#=====================================================================================
# sink(file='WhereUwant2putTheLog')
library(survival)
library(survminer)
library(cmprsk)
#Figure 2  intent to treat (data: cccg1.xlsx)
# Panel A
data1<-Surv(cccg1$Time2EFSY,cccg1$censor2)
lr<-survdiff(data1~cccg1$IGroup)
lr
cat("--------------------------------------------------\n")
lr1<-survfit(data1~cccg1$IGroup)
summary(lr1)
ggsurvplot(lr1,data=cccg1,xlim=c(0,4),ncensor.plot=TRUE,ylab="Event-free Survival",xlab="Time from diagnosis(years)",
        risk.table= TRUE,legend=c(0.3,0.4),legend.title=" ",risk.table.y.text.col=F)
# HR and CI
data1<-Surv(cccg1$Time2EFSY,cccg1$censor2)
cox1<-coxph(data1~as.factor(cccg1$IGroup))
summary(cox1)
cat("==================================================\n")
# Panel B
data1<-Surv(cccg1$Time2OSY,cccg1$OS)
lr<-survdiff(data1~cccg1$IGroup)
lr
cat("--------------------------------------------------\n")
lr1<-survfit(data1~cccg1$IGroup)
summary(lr1)
ggsurvplot(lr1,data=cccg1,xlim=c(0,4),ncensor.plot=TRUE,ylab="Overall Survival",xlab="Time from diagnosis(years)",
        risk.table= TRUE,legend=c(0.3,0.4),legend.title=" ",risk.table.y.text.col=F)
# HR and CI
data1<-Surv(cccg1$Time2OSY,cccg1$OS)
cox1<-coxph(data1~as.factor(cccg1$IGroup))
summary(cox1)
cat("==================================================\n\n\n")


#Figure 3  (Data: cccg1comp.xlsx)
# Panel A
{
  Z <- cuminc(cccg1comp$time2efs,cccg1comp$'any R',group=cccg1comp$IGROUP)
  print(Z)
  Est <- timepoints(Z, times=3.9)
  print(Est)
  print(Z$Tests)
  time0 <- Z$"1 1"$time
  est0 <- Z$"1 1"$est
  time1 <- Z$"2 1"$time
```

```
  est1 <- Z$"2 1"$est
plot(time0,est0,main="Cumulative Risk Any Relapse",col=c('blue'),xlab="Time from
diagnosis(years)",ylab="probability",type="l",
    xlim=c(0,4.5),ylim=c(0,0.35))
lines(time1,est1,col=c('red'))
legend(c(0.1,1),c(0.2,0.14), c("Imatinib","Dasatinib"),pch="-",col=c('red','blue'))
}
cat("------------------------------------------------------------------\n")
# Panel B
{
  Z <- cuminc(cccg1comp$time2efs,cccg1comp$'Isolated CNS R',group=cccg1comp$IGROUP)
  print(Z)
  Est <- timepoints(Z, times=3.9)
  print(Est)
  print(Z$Tests)
  time0 <- Z$"1 1"$time
  est0 <- Z$"1 1"$est
  time1 <- Z$"2 1"$time
  est1 <- Z$"2 1"$est
plot(time0,est0,main=" Cumulative Risk Isolated CNS Relapse ",col=c('blue'),xlab="Time from
diagnosis(years)",ylab="probability",
    type="l",xlim=c(0,4.5),ylim=c(0,0.35))
lines(time1,est1,col=c('red'))
legend(c(0.1,1),c(0.2,0.14), c("Imatinib","Dasatinib"),pch="-",col=c('red','blue'))
}
cat("------------------------------------------------------------------\n")
# Panel C
{
  Z <- cuminc(cccg1comp$time2efs,cccg1comp$'R involving CNS',group=cccg1comp$IGROUP)
  print(Z)
  Est <- timepoints(Z, times=3.9)
  print(Est)
  print(Z$Tests)
  time0 <- Z$"1 1"$time
  est0 <- Z$"1 1"$est
  time1 <- Z$"2 1"$time
  est1 <- Z$"2 1"$est
plot(time0,est0,main=" Cumulative Risk Any CNS Relapse ",col=c('blue'),xlab="Time from
diagnosis(years)",ylab="probability",
    type="l",xlim=c(0,4.5),ylim=c(0,0.35))
lines(time1,est1,col=c('red'))
legend(c(0.1,1),c(0.2,0.14), c("Imatinib","Dasatinib"),pch="-",col=c('red','blue'))
}
cat("------------------------------------------------------------------\n")
# Panel D
{
  Z <- cuminc(cccg1comp$time2efs,cccg1comp$'Death in remission',group=cccg1comp$IGROUP)
  print(Z)
  Est <- timepoints(Z, times=3.9)
  print(Est)
  print(Z$Tests)
  time0 <- Z$"1 1"$time
  est0 <- Z$"1 1"$est
  time1 <- Z$"2 1"$time
  est1 <- Z$"2 1"$est
```

```
plot(time0,est0,main=" Cumulative Risk Death in Remission",col=c('blue'),xlab="Time from
diagnosis(years)",ylab="probability",
    type="l",xlim=c(0,4.5),ylim=c(0,0.35))
lines(time1,est1,col=c('red'))
legend(c(0.1,1),c(0.2,0.14), c("Imatinib","Dasatinib"),pch="-",col=c('red','blue'))
}
cat("===========================================================================\n\n\n")


# eFigure 1 (Dara: cccg1.xlsx)
#Panel A
data1<-Surv(cccg1$Time2EFSY,cccg1$censor1)
lr<-survdiff(data1~cccg1$AGroup)
lr
cat("------------------------------------------------------------\n")
lr1<-survfit(data1~cccg1$AGroup)
summary(lr1)
ggsurvplot(lr1,data=cccg1,xlim=c(0,4),ncensor.plot=TRUE,ylab="Event-free Survival",xlab="Time from
diagnosis(years)",
          risk.table= TRUE,legend=c(0.3,0.4),legend.title=" ",risk.table.y.text.col=F)
data1<-Surv(cccg1$Time2EFSY,cccg1$censor1)
cox1<-coxph(data1~as.factor(cccg1$AGroup))
summary(cox1)
cat("===========================================================================\n")
# Panel B
data1<-Surv(cccg1$Time2OSY,cccg1$OS)
lr<-survdiff(data1~cccg1$AGroup)
lr
cat("------------------------------------------------------------\n")
lr1<-survfit(data1~cccg1$AGroup)
summary(lr1)
ggsurvplot(lr1,data=cccg1,xlim=c(0,4),ncensor.plot=TRUE,ylab="Overall Survival",xlab="Time from
diagnosis(years)",
          risk.table= TRUE,legend=c(0.3,0.4),legend.title=" ",risk.table.y.text.col=F)
data1<-Surv(cccg1$Time2OSY,cccg1$OS)
cox1<-coxph(data1~as.factor(cccg1$AGroup))
summary(cox1)
cat("===========================================================================\n\n\n")

# eFigure 2  (Data: cccg1comp.xlsx)
#Panel A
{
  Z <- cuminc(cccg1comp$time2efs,cccg1comp$'any R',group=cccg1comp$AGROUP)
  print(Z)
  Est <- timepoints(Z, times=3.9)
  print(Est)
  print(Z$Tests)
  time0 <- Z$"1 1"$time
  est0 <- Z$"1 1"$est
  time1 <- Z$"2 1"$time
  est1 <- Z$"2 1"$est
plot(time0,est0,main="Cumulative Risk Any Relapse",col=c('blue'),xlab="Time from
diagnosis(years)",ylab="probability",
    type="l",xlim=c(0,4.5),ylim=c(0,0.35))
lines(time1,est1,col=c('red'))
legend(c(0.1,1),c(0.2,0.14), c("Imatinib","Dasatinib"),pch="-",col=c('red','blue'))
```

```
}
cat("-------------------------------------------------------\n")
# Panel B
{
  Z <- cuminc(cccg1comp$time2efs,cccg1comp$'Isolated CNS R',group=cccg1comp$AGROUP)
  print(Z)
  Est <- timepoints(Z, times=3.9)
  print(Est)
  print(Z$Tests)
  time0 <- Z$"1 1"$time
  est0 <- Z$"1 1"$est
  time1 <- Z$"2 1"$time
  est1 <- Z$"2 1"$est
plot(time0,est0,main=" Cumulative Risk Isolated CNS Relapse ",col=c('blue'),xlab="Time from
diagnosis(years)",ylab="probability",
     type="l",xlim=c(0,4.5),ylim=c(0,0.35))
lines(time1,est1,col=c('red'))
legend(c(0.1,1),c(0.2,0.14), c("Imatinib","Dasatinib"),pch="-",col=c('red','blue'))
}
cat("-------------------------------------------------------\n")
# Panel C
{
  Z <- cuminc(cccg1comp$time2efs,cccg1comp$'R involving CNS',group=cccg1comp$AGROUP)
  print(Z)
  Est <- timepoints(Z, times=3.9)
  print(Est)
  print(Z$Tests)
  time0 <- Z$"1 1"$time
  est0 <- Z$"1 1"$est
  time1 <- Z$"2 1"$time
  est1 <- Z$"2 1"$est
plot(time0,est0,main=" Cumulative Risk Any CNS Relapse ",col=c('blue'),xlab="Time from
diagnosis(years)",ylab="probability",
     type="l",xlim=c(0,4.5),ylim=c(0,0.35))
lines(time1,est1,col=c('red'))
legend(c(0.1,1),c(0.2,0.14), c("Imatinib","Dasatinib"),pch="-",col=c('red','blue'))
}
cat("-------------------------------------------------------\n")
# Panel D
{
  Z <- cuminc(cccg1comp$time2efs,cccg1comp$'Death in remission',group=cccg1comp$AGROUP)
  print(Z)
  Est <- timepoints(Z, times=3.9)
  print(Est)
  print(Z$Tests)
  time0 <- Z$"1 1"$time
  est0 <- Z$"1 1"$est
  time1 <- Z$"2 1"$time
  est1 <- Z$"2 1"$est
plot(time0,est0,main=" Cumulative Risk Death in Remission",col=c('blue'),xlab="Time from
diagnosis(years)",ylab="probability",
     type="l",xlim=c(0,4.5),ylim=c(0,0.35))
lines(time1,est1,col=c('red'))
legend(c(0.1,1),c(0.2,0.14), c("Imatinib","Dasatinib"),pch="-",col=c('red','blue'))
}
cat("=====================================================================\n\n\n")
```

```
# Table 1, Multivariate (Data: cccg2.xlsx)
cat(" Table 1:\n")
data9<-Surv(cccg2$Time2EFSY,cccg2$censor2)
cox2<-coxph(data9~as.factor(cccg2$IGROUP)+as.factor(cccg2$AGE)+as.factor(cccg2$'WBC(100)')
        +as.factor(cccg2$CNSL)+as.factor(cccg2$'D19MRD(5)')+as.factor(cccg2$'D46MRD(%)')
        +as.factor(cccg2$BT)+as.factor(cccg2$FRisk))
summary(cox2)
cat("=================================================================\n\n\n")


# eTable 5, Univariate  (Data: cccg1D.xlsx/ cccg1I.xlsx)
#Imatinib
cat(" eTable 5, Imatinib\n")
data<-Surv(cccg1I$Time2EFSY,cccg1I$censor2)
cox1<-coxph(data~as.factor(cccg1I$AGE))
summary(cox1)
cox1<-coxph(data~as.factor(cccg1I$SEX))
summary(cox1)
cox1<-coxph(data~as.factor(cccg1I$'WBC(100)'))
summary(cox1)
cox1<-coxph(data~as.factor(cccg1I$'CNSL'))
summary(cox1)
cox1<-coxph(data~as.factor(cccg1I$BT))
summary(cox1)
cox1<-coxph(data~as.factor(cccg1I$'P190/210'))
summary(cox1)
cox1<-coxph(data~as.factor(cccg1I$FRisk))
summary(cox1)
cox1<-coxph(data~as.factor(cccg1I$'D19MRD(5)'))
summary(cox1)
cox1<-coxph(data~as.factor(cccg1I$'D46MRD(%)'))
summary(cox1)
cat("------------------------------------------------\n")
#Dasatinib
cat(" eTable 5, Dasatinib\n")
data<-Surv(cccg1D$Time2EFSY,cccg1D$censor2)
cox1<-coxph(data~as.factor(cccg1D$AGE))
summary(cox1)
cox1<-coxph(data~as.factor(cccg1D$SEX))
summary(cox1)
cox1<-coxph(data~as.factor(cccg1D$'WBC(100)'))
summary(cox1)
cox1<-coxph(data~as.factor(cccg1D$'CNSL'))
summary(cox1)
cox1<-coxph(data~as.factor(cccg1D$BT))
summary(cox1)
cox1<-coxph(data~as.factor(cccg1D$'P190/210'))
summary(cox1)
cox1<-coxph(data~as.factor(cccg1D$FRisk))
summary(cox1)
cox1<-coxph(data~as.factor(cccg1D$'D19MRD(5)'))
summary(cox1)
cox1<-coxph(data~as.factor(cccg1D$'D46MRD(%)'))
summary(cox1)
cat("=================================================================\n\n\n")
```

```
# eTable 3, eTable 6  (Data: cccg-table1.xlsx)
# eTable 3
{
cat(" eTable 3:\n")
# Age
  X <- matrix(c(1,63,33,0,63,29),3,2)
  Z <- fisher.test(X)
  print(Z)
# Sex
  X <- matrix(c(70,27,66,26),2,2)
  Z <- fisher.test(X)
  print(Z)
# WBC
  X <- matrix(c(32,20,45,43,12,37),3,2)
  Z <- fisher.test(X)
  print(Z)
# CNS
  X<- matrix(c(87,7,3,83,6,3),3,2)
  Z <- fisher.test(X)
  print(Z)
# Lineage
  X <- matrix(c(95,2,90,2),2,2)
  Z <- fisher.test(X)
  print(Z)
# t(9;22)
  X<- matrix(c(1,5,91,5,9,78),3,2)
  Z <- fisher.test(X)
  print(Z)
# BCR-ABL
  X <- matrix(c(65,14,62,10),2,2)
  Z <- fisher.test(X)
  print(Z)
# Initial risk
  X <- matrix(c(97,0,92,0),2,2)
  Z <- fisher.test(X)
  print(Z)
# Final risk
  X <- matrix(c(93,4,91,1),2,2)
  Z <- fisher.test(X)
  print(Z)
}
cat("-----------------------------------------------------\n")
# eTable 6
{
cat(" eTable 6:\n")
# Age
  X <- matrix(c(1,63,31,0,63,31),3,2)
  Z <- fisher.test(X)
  print(Z)
# Sex
  X <- matrix(c(66,29,70,24),2,2)
  Z <- fisher.test(X)
  print(Z)
# WBC
```

```
  X <- matrix(c(32,19,44,43,13,38),3,2)
  Z <- fisher.test(X)
  print(Z)
# CNS
  X<- matrix(c(87,6,2,83,7,4),3,2)
  Z <- fisher.test(X)
  print(Z)
# Lineage
  X <- matrix(c(92,3,93,1),2,2)
  Z <- fisher.test(X)
  print(Z)
# t(9;22)
  X<- matrix(c(2,5,88,4,9,81),3,2)
  Z <- fisher.test(X)
  print(Z)
# BCR-ABL
  X <- matrix(c(62,11,65,13),2,2)
  Z <- fisher.test(X)
  print(Z)
# Initial risk
  X <- matrix(c(95,0,94,0),2,2)
  Z <- fisher.test(X)
  print(Z)
# final risk
  X <- matrix(c(91,4,93,1),2,2)
  Z <- fisher.test(X)
  print(Z)
}
cat("=================================================================\n\n\n")

# eTable 4, eTable 7 (Data: MRD-CR.xlsx)
# eTable 4
{
cat(" eTable 4:\n")
  X <- matrix(c(28,42,8,18,37,37,9,9),4,2)
  Z <- fisher.test(X)
  print(Z)
  X <- matrix(c(72,17,4,73,17,1),3,2)
  Z <- fisher.test(X)
  print(Z)
  X <- matrix(c(92,5,91,1),2,2)
  Z <- fisher.test(X)
  print(Z)
}
cat("------------------------------------------\n")
# eTable 7
{
cat(" eTable 7:\n")
#D19 MRD
  X <- matrix(c(27,40,8,19,38,39,9,8),4,2)
  Z <- fisher.test(X)
  print(Z)
# D46 MRD
  X <- matrix(c(70,17,4,75,17,1),3,2)
  Z <- fisher.test(X)
  print(Z)
```

```
# CR end of induction
  X <- matrix(c(90,5,93,1),2,2)
  Z <- fisher.test(X)
  print(Z)
}
cat("=================================================================\n\n\n")

# eTable 8 (DATA: cccg2.xlsx)
cat(" eTable 8:\n")
data9<-Surv(cccg2$Time2EFSY,cccg2$censor1)
cox2<-coxph(data9~as.factor(cccg2$AGROUP)+as.factor(cccg2$AGE)+as.factor(cccg2$'WBC(100)')
                +as.factor(cccg2$CNSL)+as.factor(cccg2$'D19MRD(5)')+as.factor(cccg2$'D46MRD(%)')
                +as.factor(cccg2$BT)+as.factor(cccg2$FRisk))
summary(cox2)
cat("=================================================================\n\n\n")

# eTable 9   (Data: AE.xlsx)
{
  cat(" eTable 9:\n")
# Grade 5 infection
  X <- matrix(c(5,90,5,89),2,2)
  Z <- fisher.test(X)
  print(Z)
#Grade 3/4 infection:
  X <- matrix(c(26,69,24,70),2,2)
  Z <- fisher.test(X)
  print(Z)
# Fungal
  X <- matrix(c(7,88,7,87),2,2)
  Z <- fisher.test(X)
  print(Z)
# Pancreatitis
  X <- matrix(c(8,87,8,86),2,2)
  Z <- fisher.test(X)
  print(Z)
#Seizure
  X <- matrix(c(4,91,4,90),2,2)
  Z <- fisher.test(X)
  print(Z)
# Thrombosis
  X <- matrix(c(1,94,1,93),2,2)
  Z <- fisher.test(X)
  print(Z)
# Intestinal hemorrhage
  X <- matrix(c(1,94,2,92),2,2)
  Z <- fisher.test(X)
  print(Z)
# Pleural effusion
  X <- matrix(c(2,93,4,90),2,2)
  Z <- fisher.test(X)
  print(Z)
# Hyperbilli
  X <- matrix(c(1,94,1,93),2,2)
  Z <- fisher.test(X)
  print(Z)
}
```

```
#Close the sink()
#sink()
```