Appendix F. Model Documentation

**Indentification # 1683**

Siebert U, Sroczynski G, Aidelsburger P, Rossol S, Wasem J, Manns MP McHutchison JG, Wong DB. Clinical effectiveness and cost effectiveness of tailoring chronic hepatitis C treatment with peginterferon alpha-2b plus ribavirin to HCV genotype and early viral response: a decision analysis based on German guidelines. Pharmacoeconomics 2009;27:341–54.

**Base-case population**

Cohort of men and women aged 20 to 70 years old with (1) mild chronic hepatitis C, (2) moderate chronic hepatitis C, or (3) compensated cirrhosis.

**Strategies**

1. No antiviral treatment;

2. Interferon -a-2b (3 million units three times per week) plus ribavirin (1,000–1,200 mg/day) for 48 weeks considering treatment discontinuation at week 24, when HCV RNA viral load was detectable;

3. Pegylated interferon-a-2b (1.5 mg/kg weekly) plus weight-based ribavirin (800–1,200 mg/ day) for 48 weeks considering treatment discontinuation at week 24, when HCV RNA viral load was detectable;

4. Genotype-specific treatment duration and dosage according to the German

guidelines:

(a) for HCV genotype 2/3, pegylated interferon-a-2b (1.5 mg/kg weekly) plus ribavirin (800 mg/day) for 24 weeks without using stopping rules;

(b) for HCV genotype 1, pegylated interferon-a-2b (1.5 mg/kg weekly) plus weight based ribavirin (800–1,200 mg/day) for 48 weeks considering early treatment discontinuation after 12 weeks (if detectable HCV RNA and viral load drop <2 log) and 24 weeks (if detectable HCV RNA in early responders with detectable HCV RNA after 12 weeks).

**Model type:** Markov

**Time horizon:** Lifetime

**Cycle length:** 1 year

**Outcomes:** 20-year risk of compensated and decompensated cirrhosis, hepatocellular carcinoma, liver transplantation, liver-related death, life expectancy, quality-adjusted life-years (QALYs), incremental cost-effectiveness ratios (ICERs)

**Probabilistic sensitivity analysis (y/n):** Y

**Validation (y/n):** Y

**Model parameters (N = natural history; E = effectiveness; R = risk)**

Prevalence of mild chronic hepatitis C (Knodell periportal inflammation score of 0–1) (N)

Prevalence of moderate chronic hepatitis C (Knodell periportal inflammation score of 3–10) (N)

Prevalence of compensated cirrhosis (Knodell fibrosis score of 4) (N)

Risk of diuretic-sensitive ascites (R)

Risk of diuretic-refractory ascites (R)

Risk of variceal haemorrhage (N/R)

Risk of hepatic encephalopathy (N/R)

Risk of hepatocellular carcinoma (N/R)

Risk of liver transplantation (N/R)

Risk of decompensated cirrhosis (N/R)

**Indentification # 1691**

Bendavid E, Wood R, Katzenstein DA, Bayoumi AM, Owens DK. Expanding antiretroviral options in resource-limited settings—a cost-effectiveness analysis. J Acquir Immune Defic Syndr 2009;52:106–13.

**Base-case population**

Cohort of HIV infected men and women in South Africa who present for care.

**Strategies**

1. A strategy of 2 antiretroviral regimens consistent with the World Health Organization (WHO) guidelines and with standard practice in many parts of sub-Saharan Africa. {, 2006 #484} The initial regimen included two older nucleoside/nucleotide reverse transcriptase inhibitors (NRTIs) plus a non-nucleoside reverse transcriptase inhibitors (NNRTI). That was followed by a second-line regimen with a different backbone of NRTIs and a boosted protease inhibitor (bPI).
2. A three-regimen strategy which started with a triple NRTI regimen followed by two regimens similar (though not identical) to the WHO strategy.
3. A three-regimen strategy which started with WHO’s 2 regimens followed by a third-line regimen based on a second-generation bPI.

**Model type:** Microsimulation model

**Time horizon:** Lifetime

**Cycle length:** Monthly

**Outcomes:** Life expectancy and ICERs

**Probabilistic sensitivity analysis (y/n):** Y

**Validation (y/n):** Y

**Model parameters (N = natural history; E = effectiveness; R = risk)**

Rate of progression, by CD4 count and RNA load (N)

Monthly probability of developing a severe opportunistic disease (N)

Risk of death by CD4 count (N/R)

Additional risk of death due to an opportunistic disease (N/R)

Percent suppressed at one year (by treatment regimen) (E)

Drop in CD4 count with drug discontinuation (R)

Rise in viral load set point with drug discontinuation (R)

Risk of regimen change or discontinuation due to drug toxicity (R)

**Indentification # 1697**

Chaudhary MA, Moreno S, Kumar RN, Nocea G, Elbasha E. Cost-effectiveness analysis of raltegravir in treatment-experienced HIV type 1-infected patients in Spain. AIDS Research and Human Retroviruses 2009;25:679–89.

**Base-case population**

Cohort of Spanish HIV1-infected men and women who have received previous treatment for HIV and were resistant to at least one drug in each of the three classes [nucleoside reverse transcriptase inhibitors (NRTIs), nonnucleoside reverse transcriptase inhibitors (NNRTIs), and protease inhibitors (PIs)] of ARTs.

Strategies

1. Optimized background therapy alone

2. Raltegravir 400mg bid and optimized background therapy

**Model type:** Markov model

**Time horizon:** 50 years

**Cycle length:** Instantaneous (differential equation-based model)

**Outcomes:** Primary and recurrent OI cases, Life Years, QALYs, ICERs

**Probabilistic sensitivity analysis (y/n):** N

**Validation (y/n):** Y

**Model parameters (N = natural history; E = effectiveness; R = risk)**

Baseline distribution of cohort by CD4 count (N/E)

Incidence of OIs and other AIDS-related complications (N)

Mortality by CD4 count (N) and history of an opportunistic infection (N)

Duration and monthly risk of death by opportunistic infection (N/R)

Monthly probability of progression by CD4 and RNA count stratified by treatment (E)

Percent discontinuing drug regimen (R**)**

**Indentification # 1767**

de Kok IM , van Ballegooijen M , Habbema JDF. Cost-effectiveness analysis of human papillomavirus vaccination in the Netherlands. J Natl Cancer Inst 2009;101:1083–92.

**Base-case population**

Dutch population of young girls at risk for HPV infection, CIN, and cervical cancer.

**Strategies**

1. Screening

2. Screening + Vaccination for HPV

**Model type:** Microsimulation model

**Time horizon:** Lifetime

**Cycle length:** Not stated

**Outcomes:** Clinical cases of CIN 2 or 3, screen-detected cancers, disease-specific deaths, life-years, QALY

**Probabilistic sensitivity analysis (y/n):** N

**Validation (y/n):** N

**Model parameters (N = natural history; E = effectiveness; R = risk)**

HPV prevalence (N)

CIN grades 1, 2, and 3 prevalence (N)

Cancer incidence by stage [International Federation of Gynecology and Obstetrics (FIGO) stages IA, IB, and II+] (N)

Relative risk of developing cancer in unscreened compared to screened population (E)

Vaccine efficacy and duration (E)

Cure rate for a screen-detected precancer or cancer (E)

**Indentification # 1750**

Walensky RP, Wolf LL, Wood R, Fofana MO, Freedberg, KA, Martinson NA, Paltiel AD, Anglaret X, Weinstein MC, Losina E for the CEPAC (Cost-Effectiveness of Preventing AIDS Complications)-International Investigators. When to start antiretroviral therapy in resource-limited settings. Ann Intern Med 2009;151:157–66.

**Base-case population**

HIV-infected patients in South Africa

**Strategies**

1. No treatment,

2. ART initiated at a CD4 count less than 0.250 x 109 cells/L

3. ART initiated at a CD4 count less than 0.350 x 109 cells/L.

**Model type:** Markov model (state-transition model)

**Time horizon:** 5-year and lifetime

**Cycle length:** Monthly

**Outcomes:** Opportunistic infections, deaths, life-expectancy and ICERs

**Probabilistic sensitivity analysis (y/n):** N

**Validation (y/n):** N

**Model parameters (N = natural history**; **E = effectiveness; R = risk)**

Counts of persons with CD4 count between 0.250 and 0.350 X 109 cells/L (N)

Counts of persons living with AIDS, receiving care and receiving ART (N/E)

Baseline CD4 and RNA distribution (N)

Risk of CD4 count decrease by RNA level (N)

Risk of a mild or severe OI by CD4 count (N)

Efficacy of antiretroviral therapy (E)

Efficacy of cotrimoxazole (E)

**Indentification # 1721**

Zechmeister I, Freiesleben de Blasio B, Garnett G, RaeNeilson A, Siebert U. Cost-effectiveness analysis of human papillomavirus-vaccination programs to prevent cervical cancer in Austria. Vaccine 2009;27:5133–41.

**Base-case population**

Multiple cohorts of girls (and boys) in Austria

**Strategies**

1. Screening

2. Vaccination of 12 year old girls + screening

3. Vaccination of 12 year old girls and boys + screening (of women)

**Model type:** Differential equation/transmission model (for effectiveness measures)

**Time horizon:** 52 years (2008 to 2060)

**Cycle length:** Instantaneous/NA

**Outcomes:** Life years, ICERs

**Probabilistic sensitivity analysis (y/n):** N

**Validation (y/n):** Y

**Model parameters (N = natural history; E = effectiveness; R = risk)**

Progression rates from type-specific infection to persistent infection, CIN (1, 2, 3) and cancer (stages 1, 2, 3, 4) (N)

Regression rates from type-specific infection and CIN (N)

Stage specific survival (N)

Hysterectomy rates (N)

Rate of loss of natural immunity (N)

Sexual activity by level and age (N/R)

Average partner change (N)

Transmission rate (by HPV type) (N)

Screening coverage by age (E)

Sensitivity of screening for CIN and cancer (E)

Vaccination coverage (E)

Vaccine efficacy (E)

Vaccine duration (E)**Indentification # 1722**

Coupé VMH, de Melker HE, Snijders PJF, Meijer CJLM, Berkhof J. How to screen for cervical cancer after HPV16/18 vaccination in The Netherlands. Vaccine 2009;27:5111–19.

**Base-case population**

Cohort of 12-year-old girls in the Netherlands

**Strategies**

1. Vaccination of 12-year-old girls only
2. Screening (with varying intervals, age of first screening and use of cytology and HPV DNA tests) + vaccination

**Model type:** Markov model

**Time horizon:** Lifetime

**Cycle length:** 6 months

**Outcomes:** CIN 2/3s, cancers, cancer deaths, QALYs, ICERs

**Probabilistic sensitivity analysis (y/n):** N

**Validation (y/n):** Y

**Model parameters (N = natural history; E = effectiveness; R = risk)**

HPV incidence (by HPV type) (N)

Regression rates of HPV and CIN (1, 2, 3) (N)

Progression rates of HPV and CIN (1, 2, 3) (N)

Cancer progression rates and symptoms (by FIGO Stage 1or 2+) (N)

Screening coverage (E)

Sensitivity for CIN (1–3) by test type (cytology or HPV) (E)

Vaccine efficacy (E)

Vaccine coverage (E)

**Indentification # 1726**

Rogoza RM, Westra TA, Ferko N, Tamminga JJ, Drummond MF, Daemen T, Wilschut JC, Postma MJ.Cost-effectiveness of prophylactic vaccination against human papillomavirus 16/18 for the prevention of cervical cancer: Adaptation of an existing cohort model to the situation in the Netherlands. Vaccine 2009;27:4776–83.

**Base-case population**

Cohort of 12-year-old girls in the Netherlands

**Strategies**

1. Screening only
2. Vaccination and screening

**Model type:** Markov

**Time horizon:** Lifetime

**Cycle length:** Not stated

**Outcomes:** HPV infections (both overall and serotype specific), CIN2+ cases, cervical cancer cases, cytologies, health care resource use and life-years lived by the cohort

**Probabilistic sensitivity analysis (y/n):** Y

**Validation (y/n):** Not stated

**Model parameters (N = natural history; E = effectiveness; R = risk)**

NOTE: reader referred to an earlier publication for details of the model used in this analysis

HPV infection and progression rates (by HPV and CIN) (N)

Screening coverage (E)

Screening and follow up test performance (E)

Vaccine efficacy (for vaccine included types and related types) (E)

Duration of vaccine efficacy (E)

Vaccine coverage (E)

**Indentification # 1760**

Robotin MC, Kansil M, Howard K, George J, Tipper S, Dore GJ, Levy M, Penman AG. Antiviral therapy for hepatitis B-related liver cancer prevention is more cost-effective than cancer screening. Journal of Hepatology 2009;50:990–98.

**Base-case population**

Cohort of 35-year-old Sydney, Australia-based Asian men and women with chronic hepatitis B (CHB) infection.

**Strategies**

1. Management based on risk defined by hepatitis B virus DNA and ALT levels
2. Current clinical practice, of limited treatment of CHB and some hepatocellular carcinoma (HCC) surveillance, with most patients receiving neither.

**Model type:** Markov model

**Time horizon:** 50 years

**Cycle length:** Yearly

**Outcomes:** Cases of HCC averted, deaths averted and QALYs gained

**Probabilistic sensitivity analysis (y/n):** N

**Validation (y/n):** Not stated

**Model parameters (N = natural history; E = effectiveness; R = risk)**

Autoimmune cure (stratified by CHB or cirrhosis; current practice or prevention program) (E)

Develop cirrhosis (stratified by CHB or cirrhosis; current practice or prevention program) (N/E)

RR of cirrhosis with prevention program (stratified by CHB or cirrhosis) (E)

Develop HCC; current practice (stratified by CHB or cirrhosis) (N)

RR of HCC with prevention program (stratified by CHB or cirrhosis) (E)

CHB-related death; current practice (for patients with liver failure or HCC) (N)

RR of CHB-related death with prevention program (for patients with liver failure or HCC) (E)

**Indentification # 1665**

Rose J, Hawthorn RL, Watts B, Singer ME. Public health impact and cost effectiveness of mass vaccination with live attenuated human rotavirus vaccine (RIX4414) in India: model based analysis. BMJ 2009;339:b3653.

**Base-case population**

Cohort of Indian infants at risk of rotavirus infection

**Strategies**

1. No vaccination
2. Vaccination with live attenuated human rotavirus vaccine (RIX4414)

**Model type:** Markov model

**Time horizon:** 5 years

**Cycle length:** one month

**Outcomes:** Decrease in rotavirus gastroenteritis episodes (nonsevere and severe), deaths, outpatient visits, and admission to hospital; ICERs

**Probabilistic sensitivity analysis (y/n):** Y

**Validation (y/n):** Not stated

**Model parameters (N = natural history; E = effectiveness; R = risk)**

Risk of first, second, and third infection by age in months (N)

Probability of symptoms and severity of symptoms by infection (N)

Probability of dying from severe infection (N)

Prevalence of strains of proteins present in vaccine (N, E)

Coverage by dose (E)

Efficacy (by prevalence of proteins included in vaccine) (E)

Relative efficacy of vaccine in symptomatic compared to severe infection (E)

Duration of vaccine efficacy (E)

Probability of admission to hospital given nonsevere or severe infection (E)

Probability of outpatient treatment given nonsevere or severe infection (E)

Probability of access to oral rehydration solution at home (E)

**Indentification # 1670**

Burgos JL, Kahn JG, Strathdee SA, Valencia-Mendoza A, Bautista-Arredondo S, Laniado-Laborin R, Castañeda R, Deiss R, Garfein RS. Targeted screening and treatment for latent tuberculosis infection using QuantiFERON-TB Gold is cost effective in Mexico. Int J Tuber Lung Dis 2009;13:962–8.

**Base-case population**

Cohort of Mexican commercial sex workers and IV drug users at high risk of HIV infection and tuberculosis (TB).

**Strategies:**

1. Screening and treatment for TB
2. No screening for TB; treatment based on clinical diagnosis (assumed).

**Model type:** Markov model

**Time horizon:** 20 years

**Cycle length:** 1 year

**Outcomes:** Number of latent TB infection cases identified, TB cases averted, TB-related deaths averted, QALYs and ICERs

**Probabilistic sensitivity analysis (y/n):** N – random walk with samples

**Validation (y/n):** Not stated

**Model parameters (N = natural history; E = effectiveness; R = risk)**

Annual risk of LTBI (latent TB infection) (N)

Annual risk of HIV infection (N)

Annual risk of progression from LTBI to active TB (N)

Probability of death from active TB without treatment (N)

Probability of death from other causes (N)

Efficacy of INH (isoniazid) in reducing TB (E)

Increased adherence to INH due to financial incentives (E)

EFficay of INH treatment for LTBI infection (E)

Duration of efficacy against TB reinfection (E)

Probability of INH toxicity (R)

QFT-GIT (QuantiFERON-TB Gold In-Tube) sensitivity and specificity for LTBI (E)

QFT-GIT sensitivity and specificity active TB detection (E)

**Indentification # 1688**

Colantonioa L, Gómezc JA, Demarteaud N, Standaerte B, Pichón-Rivièrea A, Augustovski F. Cost-effectiveness analysis of a cervical cancer vaccine in five Latin American countries. Vaccine 2009;27:5519–29.

**Population**

Eleven-year-old cohort of girls from at risk of HPV infection and cervical cancer and living in one of five Latin American countries (Argentina, Brazil, Chile, Mexico, and Peru).

**Strategies:**

1. Screening only (at different ages to begin screening and intervals)
2. Vaccination at 12 years and screening (at different ages to begin screening and screening intervals)

**Model type:** Markov model

**Time horizon:** Lifetime

**Cycle length:** 1 year

**Outcomes:** Number of cervical cancer cases and deaths, QALYs, ICERs

**Probabilistic sensitivity analysis (y/n):** N

**Validation (y/n):** Y

**Model parameters (N = natural history; E = effectiveness; R = risk)**

Progression and regression rates for HPV and CIN (assumed to be the same for all five countries) (N)

Population size of 11-year old girls (country specific) (N)

Age-specific oncogenic HPV incidence rates (country specific) (N)

Age-specific mortality rates (country specific) (N)

Age-specific cervical cancer death rates (country specific) (N, E)

Prevalence of HPV 16, 18, 31, and 45 in invasive cervical cancer (country specific) (N)

Regular screening coverage (country specific) (E)

Interval between regular screening (country specific) (E)

Irregular screening coverage (country specific) (E)

Population without screening (country specific) (E)

Age of initiation of screening (country specific) (E)

Sensitivity of Pap smears to detect CIN 1 (country specific) (E)

Sensitivity of Pap smears to detect CIN 2&3 (country specific) (E)

Estimated positive Pap smears (country specific) (E)

CIN 1 and CIN 2/3 detection and efficacy of treatment (country specific) (E)

Five-year cancer cure rate (country specific) (E)

Vaccine effectiveness in preventing oncogenic HPV infection (only HPV 16/18; all four serotypes) (E)

Duration of vaccine efficacy (E)

**Indentification # 1660**

Gupta S, Faughnan, Bayoumi AM. Ebolization for pulmonary arteriovenous malformation in hereditary hemorrhagic telangiectasia. A decision analysis. Chest 2009;136:849–58.

**Base-case population**

40-year-old men with hereditary hemorrhagic telangiectasia (HHT) and an asymptomatic pulmonary arteriovenous malformation (PAVMs) with a 3-mm feeding artery.

**Strategies**

1. No embolotherapy
2. Embolotherapy only in the event of a PAVM complication (i.e., stroke, transient ischemic attack (TIA), brain abscess, hemothorax, massive hemoptysis)
3. Immediate embolotherapy

**Model type:** Markov

**Time horizon:** Lifetime

**Cycle length:** One month

**Outcomes:** Life expectancy, quality-adjusted life expectancy, proportion with a major stroke over time

**Probabilistic sensitivity analysis (y/n):** No

**Validation (y/n):** No

**Model parameters (N = natural history; E = effectiveness; R = risk)**

* PAVM complication rates (stroke, TIA, abscess, hemothorax, massive hemoptysis) without embolization (N)
* PAVM complication rates with embolization (E)
* Reperfusion or new growth after embolization (N)
* Major neurologic deficit from stroke/abscess (N)
* Death from PAVM complications (N)
* Embolization complications (death, stroke, pleurisy, deep vein thrombosis, migration of coil) (R)

**Indentification # 1669**

Rubenstien JH, Waljee AK, Jeter JM, Velayos FS, Ladabaum U, Higgins PDR. Cost effectiveness of ulcerative colitis surveillance in the setting of 5-aminosalicylates. Am J Gastroenerol 2009 (online).

**Base-case population**

35-year-old men with a 10-year history of ulcerative pancolitis that is quiescent.

**Strategies**

1. No 5-Aminosalicylates (5-ASAs) or surveillance
2. Surveillance without 5-ASA at intervals of 1–10 years (10 strategies)
3. Surveillance with 5-ASA at intervals of 1–10 years (10 strategies)
4. 5-ASA alone

**Model type:** Markov

**Time horizon:** Until age 90 or death

**Cycle length:** One year

**Outcomes:** QALYs

**Probabilistic sensitivity analysis (y/n):** Yes

**Validation (y/n):** No

**Model parameters (N = natural history; E = effectiveness; R = risk)**

* Rate of ulcerative colitis flare requiring colectomy (N)
* Colorectal cancer incidence (N)
* Progression from dysplasia to cancer (N)
* Latency of cancer until symptomatic presentation (N)
* Risk ratio of cancer with 5-ASA vs. no 5-ASA (E)
* Cancer at presentation (metastatic, local, other) (N)
* Relative risk of metastatic with surveillance vs. no surveillance (R)
* Test characteristics of colonoscopy (E)
* Complications of colectomy and colonoscopy (morbidity/mortality) (R)

**Indentification # 1693**

**PubMed ID:** 19436120

Amemiya S, Takao H. Computed tomographic coronary angiography for diagnosing stable coronary artery disease: a cost-utility and cost-effectiveness analysis. Circulation Journal 2009;73(7):1263–70.

**Base-case population**

60-year-old men at risk for stable coronary artery disease (CAD) (pretest risk assumed to be 50 percent), with history of chest pain, but without a definitive diagnosis of CAD.

**Strategies**

1. No examination and no treatment.
2. Medication; all patients receive medication for CAD, but undergo neither computed tomography coronary angiography (CTCA) nor conventional coronary angiography (CAG), thus not being revascularized until a cardiac event occurs.
3. Routine coronary angiography followed by optimal treatment for patients with CAD including elective revascularization. All patients with left main disease require revascularization. For other vessel diseases, 14.5 percent were modeled to subsequently undergo elective revascularization within the first year, referring to the results of the Clinical Outcomes Utilizing Revascularization and Aggressive Drug Evaluation (COURAGE) trial (crossover rate in the first year).
4. CTCA; all patients undergo CTCA, and those with a positive test result receive medication for CAD, some of whom go on to elective revascularization. If revascularization is planned, the patient will have coronary angiography for further evaluation as a workup study; 12 percent of CTCA-positive patients were also modeled to have CAG, but not revascularization. Patients with a negative result receive no specific treatment.

**Model type**: Markov

**Time horizon**: Lifetime

**Cycle length**: One year (implied)

**Outcomes**: QALYs

**Probabilistic sensitivity analysis**: Yes

**Validation**: Not stated

**Model parameters**

* Prevalence of CAD (N)
* CAD-specific mortality, by extent of disease (N)
* Risk reduction with by medication (E)
* Risk reduction by revascularization, by extent of disease (E)
* Relief of angina, by type of treatment (E)
* Risk of nonfatal myocardial infarction, by disease and treatment (N/E)
* Risk of revascularization, by extent of disease and treatment (N/E)
* Complications of coronary angiography (R)
* Diagnostic performance of CTCA (E)

**Indentification # 1727**

Park SM, Kim SY, Earle CC, Jeong SY, Yun YH. What is the most cost-effective strategy to screen for second primary colorectal cancers in male cancer survivors in Korea? World J Gastroenterol 2009;15:3153–60.

**Base-case population**

50-year-old Korean male colorectal cancer survivors, one year after the index cancer diagnosis.

**Strategies**

1. No screening
2. Annual fecal occult blood test (FOBT)
3. FOBT every 2 years
4. Sigmoidoscopy every 5 years
5. Double contrast barium enema every 5 years
6. Colonoscopy every 10 years
7. Colonoscopy every 5 years
8. Colonoscopy every 3 years

**Model type**: Markov

**Time horizon**: Lifetime

**Cycle length**: One year (implied)

**Outcomes**: Life expectancy

**Probabilistic sensitivity analysis**: No

**Validation**: Not stated

**Model parameters**

* Prevalence of polyps at age 50 (N)
* Polyp incidence in cancer survivors (N)
* Percent of cancers arising from polyps (N)
* Relative risk of colorectal cancer in cancer survivors compared with the general population (N)
* Dwell time in colorectal cancer early stages (N)
* Percent of cancers detected in early stages without screening (N)
* Survival for index cancer (N)
* Survival for second primary colorectal cancer, by stage (early/late) (N)
* Test performance of colorectal cancer screening tests (E)
* Adherence to colorectal cancer screening (E)
* Complications of colonoscopy/polypectomy, sigmoidoscopy, and barium enema (R)

**Indentification # 1735**

**PubMed ID:** 19539109

Xie F, Blackhouse G, Assasi N, Campbell K, Levin M, Bowen J, Tarride JE, Pi D, Goeree R. Results of a model analysis to estimate cost utility and value of information for intravenous immunoglobulin in Canadian adults with chronic immune thrombocytopenic purpura. Clinical Therapeutics 2009;31:1082–91.

**Base-case population**

Adults with persistent chronic immune thrombocytopenic purpura (ITP) at age 35 years and a body weight of 70 kg, presenting with platelet counts <20,000/μL and no active bleeding.

**Strategies**

1. Intravenous immunoglobulin (IVIg) at a dose of 1 g/kg of body weight per day in an outpatient setting for 2 consecutive days (according to Canadian guidelines).
2. Oral prednisone at a dose of 1 mg/kg of body weight per day for a month (according to published studies).

**Model type**: Markov

**Time horizon**: Lifetime

**Cycle length**: One year

**Outcomes**: QALYs

**Probabilistic sensitivity analysis**: Yes

**Validation**: Not stated

**Model parameters**

* Initial response to prednisone – considered usual care (N)
* Initial response to IVIg (E)
* First-year relapse after initial prednisone (N)
* First-year relapse after initial response to IVIg (E)
* Splenectomy after treatment of prednisone (N)
* Initial response to splenectomy (N)
* Long-term relapse with IVIg and prednosone (N)
* Long-term relapse after splenectomy (N)
* Death in refractory ITP (N)

**Indentification # 1749**

Morton RL, Howard K, Webster AC, Wong G, Craig JC. The cost-effectiveness of induction immunosuppression in kidney transplantation. Nephrol Dial Transplant 2009;24: 2258–69.

**Base-case population**

46-year-old cohort of kidney transplant patients.

**Strategies**

1. No induction, which was a triple immunosuppression regimen of a calcineurin inhibitor (tacrolimus or cyclosporine), with an antiproliferative agent (mycophenolate mofetil) and a steroid (prednisolone)
2. Induction with interleukin-2 receptor antagonists (IL2Ra) using a standard basiliximab dosing regimen of 2 ×20 mg on day 0 and day 4
3. Induction with polyclonal antibody induction using all contemporary formulations of anti-thymocyte or antilymphocyte depleting antibodies, derived from rabbit or horse at a dose of 2–5 mg/kg for 7 days

**Model type**: Markov

**Time horizon**: 20 years

**Cycle length**: 1 year

**Outcomes**: Life years, QALYs

**Probabilistic sensitivity analysis**: No

**Validation**: Not stated

**Model parameters**

* Surgical complications and probability of CAN (N)
* Graph loss due to other causes (N)
* Recurrence of primary disease (N)
* Subsequent transplant (N)
* Delayed graft function with subsequent transplant (N)
* Mortality, by year of transplant and dialysis status (N)
* Probability of functioning transplant, by intervention (N/E)
* Probability of delayed graph function, by intervention (N/E)
* Probability of acute rejection, by intervention (N/E)
* Probability of steroid-resistant acute rejection, by intervention (N/E)
* Probability of graph loss post acute rejection, by intervention (N/E)
* Probability of CMV infection the first year post transplant, by intervention (N/R)
* Probability of malignancy the first year post transplant, by intervention (N/R)

**Indentification # 1764**

**PubMed ID:** 19249771

Nguyen GC, Frick KD, Dassopoulos T. Medical decision analysis for the management of unifocal, flat, low-grade dysplasia in ulcerative colitis. Gastrointestinal Endoscopy 2009;69(7):1299–1310.

**Base-case population**

45-year-old individuals with ulcerative colitis for 10 years who are newly diagnosed with unifocal, ﬂat low-grade dysplasia (LGD) on initial surveillance colonoscopy.

**Strategies**

1. Immediate (within 6 months of initial diagnosis of LGD) colectomy with 2-stage ileal pouch anal anastomosis (IPAA)
2. Enhanced surveillance (repeated colonoscopy at 3, 6, and 12 months, and then annually). Detection of LGD, high-grade displasia, or cancer during secondary surveillance prompts immediate referral for colectomy.

**Model type**: Markov

**Time horizon**: Lifetime

**Cycle length**: Three months

**Outcomes**: QALYs

**Probabilistic sensitivity analysis**: Yes

**Validation**: Face validity checks

**Model parameters**

* Risk of synchronous cancer (N)
* Incidence of LGD from no dysplasia (N)
* Incidence of advance neoplasia, from LGD or from no dysplasia (N)
* Distribution of advanced neoplasia (LGD or cancer) (N)
* Distribution of cancer stage (N)
* Cancer-specific mortality, by stage (N)
* Diagnostic performance of colonoscopy (E)
* No risk of cancer with colectomy (E)
* Complications of IPAA (R)
* Supportive care requirements for IPAA, by type and year (R)

**Indentification # 1774**

Cowie MR, Marshall D, Drummond M, Ferko N, Maschio M, Ekman M, de Roy L, Heidbuchel H, Verboven Y, Braunschweig F, Linde C, Boriani G. Lifetime cost-effectiveness of prophylactic implantation of a cardioverter defibrillator in patients with reduced left ventricular systolic function: results of Markov modelling in a European population. Europace 2009;11:716–26.

**Base-case population**

45-year-old patients with chronic heart failure in New York Heart Association class II or III, or prior myocardial infarction with or without heart failure with ulcerative colitis for 10 years who are newly diagnosed with unifocal, ﬂat LGD on initial surveillance colonoscopy.

**Strategies**

1. Prophylactic implantable cardioverter defibrillator (ICD)
2. No ICD (conventional therapy)

**Model type**: Markov

**Time horizon**: Lifetime

**Cycle length**: 1 month

**Outcomes**: Life years, QALYs

**Probabilistic sensitivity analysis**: Yes

**Validation**: Yes

**Model parameters**

* Mortality risks (sudden death, heart failure, other cardiac, non-cardiac) (N/E)
* Initial implant operative death probability (R)
* One-month probability of ICD complications (inappropriate shocks) (R)
* Probability of discontinuing ICD after inappropriate shocks (R)
* Probability of lead replacement (R)
* Probability of lead infection, initial and replacement (R)
* Probability of lead dislodgement, initial and replacement (R)

**Indentification # 1790**

**PubMed ID:** 19502849

Neuman HB, Elkin EB, Guillem JG, Paty PB, Weiser MR, Wong WD, Temple LK. Treatment for patients with rectal cancer and a clinical complete response to neoadjuvant therapy: a decision analysis. Dis Colon Rectum 2009;52(5):863-71.

**Base-case population**

65-year-old men, medically fit to undergo major surgery, without distant metastases, with stages I to III rectal cancer who have a clinical complete response 8 to 12 weeks after completion of neoadjuvant (i.e., preoperative) chemoradiotherapy.

**Strategies**

1. Surgical resection
2. Observation

**Model type**: Markov

**Time horizon**: Lifetime

**Cycle length**: One month

**Outcomes**: Life years, QALYs

**Probabilistic sensitivity analysis**: Yes

**Validation**: Yes

**Model parameters**

* Likelihood of pathologic complete response if clinical complete response (N)
* Risk of relapse if pathologic complete response and observation alone (N)
* Risk of relapse if pathologic partial response and observation alone (N)
* Risk of relapse if pathologic complete response and surgery (E)
* Risk of relapse if pathologic partial response and surgery (E)
* Percent of recurrences that are distant, by pathologic response and treatment (N/E)
* Percent receiving salvage surgery for local recurrence, by treatment (N/R)
* Survival after local recurrence, by salvage surgery status (N)
* Survival after metastatic disease (N)
* Surgical mortality for index and salvage surgeries (R)

**Indentification # 1794**

Ehler L, Overvad K, Sorensen J, Christensen S, Bech M, Kjolby M. Analysis of cost effectiveness of screening Danish men aged 65 for abdominal aortic aneurysm. BMJ 2009;338:b2243.

**Base-case population**

Cohort of men aged 65 invited (or not invited) for ultrasound screening in the Danish health care system.

**Strategies**

1. No screening program
2. Ultrasound screening; refer large (≥5.5 cm) aneurysms for vascular surgical assessment, and rescan regularly if the aneurysm was small (3-4.4 cm) or medium sized (4.5-5.4)

**Model type**: Markov

**Time horizon**: Lifetime

**Cycle length**: One year

**Outcomes**: QALYs

**Probabilistic sensitivity analysis**: Yes

**Validation**: Yes

**Model parameters**

* Prevalence of abdominal aortic aneurysm ≥3 cm (N)
* Distribution of size of abdominal aortic aneurysm (N)
* Annual risk of rupture, by size (N)
* Growth rate per year (small to medium; medium to large) (N)
* Screening participation rate (E)
* Proportion of patients with large abdominal aortic aneurysm who are eligible for surgery (E)
* Mortality from elective or emergency surgery (R/N)
* Proportion of ruptures where patient reaches hospital alive (N)
* Ad hoc diagnosis of abdominal aortic aneurysm (N)

**Indentification # 1801**

Nuijten M, Andress DL, Marx SE, Sterz R. Chronic kidney disease Markov model comparing paricalcitol to calcitriol for secondary hyperparathyroidism: a US perspective. Curr Med Res Opin 2009;25(5):1221-34.

**Base-case population**

Cohort of chronic kidney disease patients.

**Strategies**

1. Treatment with paricalcitol for secondary hyperparathyroidism
2. Treatment with calcitriol

**Model type**: Markov

**Time horizon**: Lifetime

**Cycle length**: One year

**Outcomes**: QALYs

**Probabilistic sensitivity analysis**: Yes

**Validation**: Yes

**Model parameters**

* Transitions among chronic kidney disease health states, defined according to the Kidney Dialysis Outcomes Quality Initiative (N)
* Risk of developing proteinuria, by disease stage (N)
* Type of treatment started (hemodialysis, peritoneal dialysis, transplantation) for patients progressing to worst stage (N)
* Risk of hospitalization (N)
* Risk of death, by stage and hospitalization (N)
* Absolute reduction in progression of disease with treatment (E)

**Indentification # 1985**

Eckman MH, Rosand J, Greenberg SM, Gage BF. Cost-effectiveness of using pharmacogenetic information in warfarin dosing for patients with nonvalvular atrial fibrillation. Ann Intern Med 2009;150:73-83.

**Base-case population**

Cohort of 69 year-old men newly diagnosed with nonvalvular atrial fibrillation and no contraindications to warfarin therapy.

**Strategies**

1. Standard induction of warfarin therapy.
2. Test for CYP2C9\*2 and CYP2C9\*3 alleles and the A haplotype of VKORC1 and, if present, initiate warfarin therapy at lower dose as calculated by a pharmacogenetic-based algorithm.

**Model type**: Markov

**Time horizon**: Lifetime

**Cycle length**: One month

**Outcomes**: QALYs

**Probabilistic sensitivity analysis**: Yes

**Validation**: Yes

**Model parameters**

* Allele frequency (N)
* Relative hazard of major bleeding events in variants vs. wild-type alleles during initiation phase (E/R)
* Days with subtherapeutic INR (international normalized ratio) (E)
* Relative hazard of major bleeding events during initiation vs. maintenance (R)
* Relative hazard of major bleeding events with pharmacogenetic-guided dosing (E)
* Delayed start time for therapy (R)
* Rate of thromboembolism, by treatment (N/E)
* Prognosis of thromboembolism (death, disability, recovery) (N)
* Rate of bleeding event (untreated), by location of event (N)
* Rate of bleeding event (treated), by location of event (R)
* Prognosis of major bleeding, by type and treatment (death, disability, recovery) (N/R)