

Supplementary Material for

Review of methods and study designs of evaluations related to clinical pathways

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The supplementary material comprises two tables (Table S1 and Table S2) which summarise the study characteristics of the 55 articles included in the review.

Table S1. General study characteristics of the 55 articles identified for inclusion in the review.*

First author's surname	Year	Title	Intervention	Country	Study setting
Halley ¹	2000	Approaches to drug therapy, formulary, and pathway management in a large community hospital	CPW for management of community-acquired pneumonia (CAP)	USA	hospital
Hwang ²	2000	Implementation and evaluation of a clinical pathway for TRAM breast reconstruction	CPW for transverse rectus abdominis musculocutaneous (TRAM) breast reconstruction	USA	hospital
Levin ³	2000	The effectiveness of a "critical pathway" in the management of laryngectomy patients	CPW for laryngectomy patients	USA	hospital
Lewis ⁴	2000	A performance improvement initiative: development of a peripheral vascular pathway	peripheral vascular bypass CPW	USA	hospital
Wee ⁵	2000	The development of a stroke clinical pathway: an experience in a medium-sized community hospital	stroke CPW	USA	hospital
Wong ⁶	2000	Development, dissemination, implementation and evaluation of a clinical pathway for oxygen therapy	CPW for administration of oxygen	Canada	hospital
Calland ⁷	2001	Outpatient laparoscopic cholecystectomy: patient outcomes after implementation of a clinical pathway	CPW for outpatient laparoscopic cholecystectomy (LC)	USA	hospital
McIlvoy ⁸	2001	Successful incorporation of the severe head injury guidelines into a phased-outcome clinical pathway	severe traumatic brain injury (TBI) CPW	USA	hospital
Vitaz ⁹	2001	Development and implementation of a clinical pathway for severe traumatic brain injury	CPW for treatment of severe traumatic brain injury (TBI)	USA	hospital
Vitaz ¹⁰	2001	Development and implementation of a clinical pathway for spinal cord injuries	CPW for treatment of spinal cord injuries (SCI)	USA	hospital

* Abbreviation used: CPW – clinical pathway

Wazeka ¹¹	2001	Impact of a pediatric asthma clinical pathway on hospital cost and length of stay	CPW for paediatric asthma	USA	hospital
DeSomma ¹²	2002	Clinical methods. Impact of a clinical pathway on the postoperative care of children undergoing surgical closure of atrial septal defects	CPW on postoperative management of children undergoing surgical closure of atrial septal defects (ASDs)	USA	hospital
Healy ¹³	2002	Impact of cost reduction programs on short-term patient outcome and hospital cost of total knee arthroplasty	CPW and knee-implant standardization program for total knee arthroplasty (TKA)	USA	hospital
Lee ¹⁴	2002	Effect of a clinical pathway on selected clinical outcomes of pulmonary lobectomy	CPW after pulmonary lobectomy	Taiwan	hospital
Melbert ¹⁵	2002	Use of a critical pathway for colon resections	CPW for elective colon and rectal resections	USA	hospital
Michalsky ¹⁶	2002	Streamlining the care of patients with hypertrophic pyloric stenosis: application of a clinical pathway	CPW for infants with hypertrophic pyloric stenosis (HPS)	USA	hospital
Uchiyama ¹⁷	2002	Effectiveness of the clinical pathway to decrease length of stay and cost for laparoscopic surgery	CPW for laparoscopic surgeries, namely laparoscopic cholecystectomy (Lap C), laparoscopically assisted distal gastrectomy with Billroth-I reconstruction (Lap. B-I) and laparoscopically assisted colectomy (Lap. Colon)	Japan	hospital
Wilson ¹⁸	2002	An evidence-based clinical pathway for bronchiolitis safely reduces antibiotic overuse	CPW for bronchiolitis	USA	hospital
Burns ¹⁹	2003	Implementation of an institutional program to improve clinical and financial outcomes of mechanically ventilated patients: one-year outcomes and lessons learned	outcomes management (OM) process, included an evidence based CPW, treatment protocol and dedicated staff	USA	hospital

Panella ²⁰	2003	Reducing clinical variations with clinical pathways: do pathways work?	CPW for inguinal hernia repair; CPW for stroke; CPW for chronic renal failure; CPW for chronic heart failure; CPW for total hip replacement	Italy	hospital
Ranjan ²¹	2003	Effectiveness of the clinical pathway in the management of congestive heart failure	CPW for congestive heart failure (CHF)	USA	hospital
Holden ²²	2004	Use of a clinical pathway to manage unsuspected radiographic findings	CPW to manage unsuspected radiographic findings (URFs)	USA	hospital
Mackay ²³	2004	Liver transplant assessment as same day admission	same day admission project (SDAP) which is a multidisciplinary intervention including CPW	Australia	hospital
Brunenberg ²⁴	2005	Joint recovery programme versus usual care: an economic evaluation of a clinical pathway for joint replacement surgery	CPW for patients undergoing joint replacement (JRP)	Netherlands	hospital
Lemberg ²⁵	2005	The role of a clinical pathway in curtailing unnecessary investigations in children with gastroenteritis	CPW on investigation ordering in children with gastroenteritis	Australia	hospital
Soria ²⁶	2005	Evaluation of the clinical pathway for laparoscopic cholecystectomy	CPW for laparoscopic cholecystectomy	Spain	hospital
Brignole ²⁷	2006	Standardized-care pathway vs. usual management of syncope patients presenting as emergencies at general hospitals	standardized care pathway for syncope management	Italy	hospital
Campbell ²⁸	2006	Development of a clinical pathway for near-term and convalescing premature infants in a level II nursery	CPW for premature and near-term infants (NTIs)	USA	hospital
Khowaja ²⁹	2006	Utilization of King's interacting systems framework and theory of goal attainment with new multidisciplinary model: clinical pathway	CPW for surgical procedure of transurethral resection of prostate	Pakistan	hospital

Marchisio ³⁰	2006	Care pathways in obstetrics: The effectiveness in reducing the incidence of episiotomy in childbirth	CPW for childbirth	Italy	hospital
Ho ³¹	2007	Are critical pathways and implant standardization programs effective in reducing costs in total knee replacement operations?	CPW for total knee replacement (TKR) (group 2); CPW and single vendor (group 3)	USA	hospital
Topal ³²	2007	Outpatient laparoscopic cholecystectomy: clinical pathway implementation is efficient and cost effective and increases hospital bed capacity	CPW for outpatient laparoscopic cholecystectomy (OLC) to encourage more LC to be done as outpatient procedure rather than in-hospital	Belgium	hospital
Walter ³³	2007	Success of clinical pathways for total joint arthroplasty in a community hospital	CPW for total joint arthroplasty	USA	hospital
Yanagi ³⁴	2007	Evaluation of the clinical pathway for laparoscopic cholecystectomy and simulation of short-term hospitalization	CPW for laparoscopic cholecystectomy	Japan	hospital
Campillo-Soto ³⁵	2008	Evaluation of the clinical pathway for laparoscopic bariatric surgery	CPW for laparoscopic bariatric surgery	Spain	hospital
Hadwin ³⁶	2008	Modelling the cost-effectiveness and capacity impact of changes to colposcopy referral guidelines for women with mild dyskaryosis in the UK Cervical Screening Programme	new guidelines for referral to colposcopy (1 mild result during cervical screening rather than 2 consecutive mild results)	UK	all English NHS colposcopy services
Lee ³⁷	2008	Introducing a clinical pathway for acute peptic ulcer bleeding in general internal medicine wards	CPW for hospitalised patients with acute peptic ulcer bleeding (PUB)	Taiwan	hospital
Santillan ³⁸	2008	Feasibility and economic impact of a clinical pathway for pap test utilization in Gynecologic Oncology practice	CPW for pap test utilization in screening and surveillance of gynaecologic cancers	USA	university-based gynecologic oncology practice
Soria-Aledo ³⁹	2008	Evaluation and monitoring of the clinical pathway for thyroidectomy	CPW for thyroidectomy	Spain	hospital

Andriessen ⁴⁰	2009	Development and implementation of a clinical pathway to improve venous leg ulcer treatment	CPW to improve venous leg ulcer (VLU) treatment	Netherlands	not specified
Haxton ⁴¹	2009	Reducing length of stay for women who present as outpatients to delivery suite: A clinical practice improvement project	CPW for midwifery	Australia	hospital
Muller ⁴²	2009	Impact of clinical pathways in surgery	CPWs for surgical care, specifically one each for laparoscopic cholecystectomy, open herniorrhaphy and laparoscopic Roux-en-Y gastric bypass	Switzerland	hospital
Verdú ⁴³	2009	Clinical pathways as a healthcare tool: design, implementation and assessment of a clinical pathway for lower-extremity deep venous thrombosis	CPW for lower-extremity deep venous thrombosis (DVT)	Spain	hospital
Nicasio ⁴⁴	2010	Length of stay and hospital costs associated with a pharmacodynamic-based clinical pathway for empiric antibiotic choice for ventilator-associated pneumonia	CPW for empiric antibiotic choice for ventilator associated pneumonia (VAP)	USA	hospital
Hoverman ⁴⁵	2011	Pathways, outcomes, and costs in colon cancer: Retrospective evaluations in two distinct databases	CPW for oncology treatment of colon cancer	USA	oncology network practices
Krummenauer ⁴⁶	2011	Cost effectiveness of total knee arthroplasty from a health care providers' perspective before and after introduction of an interdisciplinary clinical pathway - is investment always improvement?	CPW for total knee arthroplasty (TKA)	Germany	hospital
Duncan ⁴⁷	2013	A self-paired comparison of perioperative outcomes before and after implementation of a clinical pathway in patients undergoing total knee arthroplasty	Total Joint Regional Anesthesia (TJRA) CPW	USA	hospital

Kreys ⁴⁸	2013	Documenting the benefits and cost savings of a large multistate cancer pathway program from a payer's perspective	multi-state oncology CPW for breast, lung and colorectal cancers	USA	hospital
Deng ⁴⁹	2014	Reduction of length of stay and costs through the implementation of clinical pathways for stroke management in China	CPW for stroke management	China	hospital
He ⁵⁰	2015	Clinical pathways in China - an evaluation	CPW for coronary artery disease (CAD), Caesarean section, uterine fibroids, myocardial infarction, acute appendicitis and senile cataracts	China	hospital
Pershad ⁵¹	2015	Cost-effectiveness of diagnostic approaches to suspected appendicitis in children	CPW for diagnosis of children at risk for appendicitis (LeB-P) which involves selective use of ultrasonography (USG) based on their Samuel Pediatric Appendicitis Score	USA	hospital
Holderried ⁵²	2016	Compliance of Clinical Pathways in Elective Laparoscopic Cholecystectomy: Evaluation of Different Implementation Methods	CPW integrated into paper-based medical treatment and nursing documentation for elective laparoscopic cholecystectomy	Germany	hospital
Rutman ⁵³	2016	Modification of an Established Pediatric Asthma Pathway Improves Evidence-Based, Efficient Care	modification of established asthma CPW	USA	hospital
Wang ⁵⁴	2016	DRUGS System Improving the Effects of Clinical Pathways: A Systematic Study	Drugs Rational Usage Guideline System (DRUGS)-supported CPW	China	hospital
Zhao ⁵⁵	2016	Evaluation of clinical pathway in acute ischemic stroke: A comparative study	integrated Chinese medicine and western medicine into clinical pathway for stroke	China	hospital

Table S2. Specific evaluation details of the 55 articles identified for inclusion in this review.[†]

First author's surname	Year	Study design	Data collection	Economic evaluation	Outcomes evaluated	Patient/ Outcome data source	Analytical methods	Health outcome result	Economic outcome result
Halley	2000	case-control	prospective	CCA	LOS; readmission rates within 30 days; treatment cost difference due to treatment change; hospital cost savings; cost savings from avoidance per hour of pharmacists time spent; resistance pattern; physicians' acceptance rate of CPW intervention on treatment change	individual patient data	not specified	P	P
Hwang	2000	pre-post	retrospective	CCA	LOS; postoperative complications; total postoperative charges; total postoperative costs in relative value units	individual patient data	t-test; χ^2 test; ANCOVA; F-test	P	P

[†] Abbreviations used: CPW – clinical pathway, CA – cost analysis with no explicit baseline comparator, CCA – cost-consequence analysis, CEA – cost-effectiveness analysis, LOS – length of stay, ANOVA – analysis of variance, ANCOVA – analysis of covariance, P – positive effect, I – intermediate effect, 0 – no effect, N – negative effect

Levin	2000	pre-post	retrospective	CCA	operative times; LOS; cost savings	individual patient data	descriptive statistics	P	P
Lewis	2000	observational study	retrospective	CCA	LOS; preoperative testing done > 72 hours before admission (preoperative phase); patient able to verbalise anticipated discharge plan (preoperative phase); use of PACU/floor after operation (day of surgery); active participation in physical therapy (day 2); cost discharge on postoperative day 4 (day 4); patient satisfaction	individual patient data	descriptive statistics	P	P
Wee	2000	pre-post	retrospective	CCA	clinical indicators (performance of CT scan, search for etiology of stroke, whether patient treated for hypertension, use of measures to prevent DVT, prophylactic drug treatment	individual patient data	not specified	P	P

					against recurrent stroke after discharge); LOS; hospital costs;				
Wong	2000	post-pre	prospective	CCA	LOS; final status; oxygen management outcomes (fraction of inspired oxygen (FiO_2) prescribed on day 1, median FiO_2 delivered, median arterial oxygen saturation (SaO_2), proportion drawn for arterial blood gas testing, duration of oxygen therapy, discontinuation of oxygen ordered by staff)	individual patient data	χ^2 test; Wilcoxon rank-sum test; logistic regression	P	P
Calland	2001	pre-post	retrospective (pre) and prospective (post)	CCA	successful same-day discharges; unexplained postoperative admissions; readmission rates; complications; deaths; patient satisfaction;	individual patient data	t-test; χ^2 test or Fisher exact test	P	P

					LOS; total hospital costs				
McIlvoy	2001	pre-post	retrospective (pre) and prospective (post)	CCA	ICU LOS; hospital LOS; postinjury day fed; postinjury day tracheostomy performed, number of ventilator days; incidence of pneumonia; hospital cost	individual patient data	t-test	P	P
Vitaz (TBI)	2001	pre-post	retrospective (pre) and prospective (post)	CCA	hospital LOS; ICU LOS; number of ventilator days; mortality rates; costs	individual patient data	t-test	P	P
Vitaz (SCI)	2001	pre-post	retrospective (pre) and prospective (post)	CCA	complication rates (pneumonia and decubitus ulcers); LOS (hospital LOS, ICU LOS, number of ventilator days); costs	individual patient data	t-test	P	P

Wazeka	2001	pre-post	retrospective	CCA	hospital LOS; cost per hospitalization; nursing medication, laboratory and radiology costs; relapse rate;	individual patient data	t-test; χ^2 test;	P	P
DeSomm a	2002	pre-post	retrospective (pre) and prospective (post)	not specified	hospital LOS; intensive care LOS; resource utilization (number of blood gases, other general laboratory tests, assisted ventilation time, time to chest tube removal, number of central lines)	individual patient data	t-test; ANOVA	P	P
Healy	2002	pre-post	prospective	CCA	pain score; deaths; knee function scores; patient satisfaction; discharge disposition; readmission rate; reoperation rate; hospital LOS; hospital cost;	individual patient data	t-test; χ^2 test or Fisher's exact test	P	P
Lee	2002	pre-post	retrospective (pre) and prospective (post)	CCA	LOS; pre-OP and post-OP LOS; ICU stay; items on pre-OP education; items on post-OP	individual patient data	t-test	P	P

					education; readmission rate; spirometry use; number of days chest tube in place; patient education; cost				
Melbert	2002	case- control	prospective	CCA	postoperative complications; death rates; readmission within 30 days; hospital LOS; time when patient was able to comfortably tolerate regular diet; disposition of patient after discharge; clinical intervention measures [number of ambulations per day; day on which Foley catheter removed; whether patients received prophylaxis for DVT; whether patients received epidural catheter] hospital charges per admission; patient satisfaction	individual patient data	χ^2 test; Mann- Whitney test; ANOVA	P	P

Michalsky	2002	pre-post	retrospective	CCA	time from admission to operation; time from operation to first feeding; time from operation to discharge; total LOS; hospital charges; metabolic status at admission	individual patient data	Mann-Whitney test	P	P
Uchiyama	2002	pre-post	retrospective (pre) and prospective (post)	CCA	LOS; economical efficiency	individual patient data	t-test	P	P
Wilson	2002	case-control	retrospective	CCA	LOS; hospital costs; return rate (with 72 hours of discharge); antibiotic use and steroid use	individual patient data	t-test; χ^2 test or Fisher's exact test	P	P
Burns	2003	pre-post	retrospective (pre) and prospective (post)	CCA	ventilator duration; ICU LOS; hospital LOS; mortality rate; costs	individual patient data	Wilcoxon test	P	P
Panella	2003	pre-post	prospective	CCA	LOS; core processes improvement; residual variations rate; outcome improvement; cost	individual patient data	t-test; Wilcoxon test; χ^2 test or Fisher exact test	I	I

Ranjan	2003	case-control	retrospective	CCA	benchmark of less than 4 days in hospital LOS; hospital charges; use of angiotensin-converting enzyme (ACE) inhibitors in CHF patients	individual patient data	χ^2 test; Mann-Whitney test	P	P
Holden	2004	observational study	prospective	CA	types of radiographic findings presented as URFs; outcomes and clinical significance of URFs (primary and secondary, where secondary are URFs detected from the results of the primary URF); monetary costs of URFs pathway in time and personnel	individual patient data	descriptive statistics	P	P
Mackay	2004	observational study	retrospective	CCA	acute bed days used; costs per client; staff satisfaction; patient satisfaction	individual patient data	descriptive statistics	P	P
Brunenberg	2005	pre-post	retrospective	CEA	functional level improvement (Harris Hip score [HHS] for THR and American knee society score [AKS] for TKR); generic quality of life (EuroQol) to calculate	individual patient data	t-test; ANOVA; linear regression	P	P

					QALY; costs; ICER for cost per point improvement on the HHS or AKS;				
Lemberg	2005	pre-post	retrospective	CCA	type and number of pathology tests ordered (serum urea, electrolytes and creatinine, FBC, urine microscopy, culture and sensitivity); rates of admission; ED presentations; LOS; direct costs; mortality and serious morbidity (ICU admission)	individual patient data	χ^2 test; Mann- Whitney test	P	P
Soria	2005	pre-post	retrospective (pre) and prospective (post)	CCA	degree of compliance, indicators of clinical care effectiveness; financial impact (mean cost per procedure); patient satisfaction	individual patient data	t-test	P	P

Brignole	2006	pre-post	prospective	CCA	hospitalisation rates; hospital LOS; tests performed; final diagnosis; in-hospital mortality; cost per patient; cost per diagnosis;	individual patient data	t-test; χ^2 test; Wilcoxon test;	P	P
Campbell	2006	observational study	retrospective	CA	referrals to occupational therapists; 30-day readmission rates; LOS; costs per infant	individual patient data	not specified	P	N
Khowaja	2006	case-control	prospective	CCA	clinical quality in terms of patient-, nursing- and physician-related outcomes; cost; patient satisfaction; staff satisfaction;	individual patient data	t-test; χ^2 test;	P	0
Marchisio	2006	pre-post	prospective	CCA	episiotomy rate; caesarean section rates; adverse perineal outcomes (overall laceration rates and major lacerations rate); patient satisfaction	individual patient data	t-test; χ^2 test or Fisher's exact test; logistic regression ; Wilcoxon test	P	N

Ho	2007	pre-post	prospective	CCA	operative time; LOS; compliance rate for CPW; incidence of hospital stay longer than planned; proportion patients discharged directly home; complications post-operation; total hospital costs	individual patient data	ANOVA	P	P
Topal	2007	pre-post	prospective	CCA	% patients agreed to OLC; % successful treatment under OLC mortality; complications; unplanned admission rates; costs	individual patient data	χ^2 test or Fisher's exact test; Wilcoxon test; Kruskal Wallis one-way ANOVA; Tukey-Kramer multiple comparisons test	P	P
Walter	2007	pre-post	retrospective	CCA	in-hospital complications (pneumonia, DVT, UTI); readmission rates; LOS; % discharged home;	individual patient data	t-test; ANOVA	P	P

					patient satisfaction; costs				
Yanagi	2007	pre-post	retrospective (pre) and prospective (post)	CCA	variation from CPW in CPW group; duration of hospitalization; number of National Health Institute (NHI) points for medical service fees	individual patient data	not specified	P	P
Campillo-Soto	2008	pre-post	retrospective (pre) and prospective (post)	CCA	LOS; cost per procedure; degree of compliance with stay (post only); patient satisfaction (post only);	individual patient data	t-test	P	P
Hadwin	2008	modelling	modelling	CEA	cost per QALY gained	individual patient data	economic model	P	P
Lee	2008	pre-post	retrospective (pre) and prospective (post)	CCA	use of medicine for acid suppression; hospital LOS; treatment costs; cost of diagnostic tests; total hospital cost; outcome measures (rate of recurrent bleeding; rate of repeat upper GI (UGI) endoscopy; rate of readmission within 30 days of discharge)	individual patient data	χ^2 test or Fisher's exact test; Mann-Whitney test;	P	P

Santillan	2008	pre-post	retrospective (pre) and prospective (post)	CCA	Pap test rate; cost of Pap testing;	individual patient data	t-test	P	P
Soria-Aledo	2008	pre-post	retrospective (pre) and prospective (post)	CCA	degree of compliance; hospital LOS; indicator of clinical care effectiveness (direct surgery-related complications, percentage of readmissions, rate of nosocomial infections); indicators of patient satisfaction; overall and partial costs per patient; follow up indicators (number of adverse events, number of satisfaction surveys collected, mean LOS per year, mean cost per process)	individual patient data	ANOVA	P	P
Andriessen	2009	pre-post	retrospective (pre) and prospective (post)	CCA	clinical efficiency; time to ulcer closure; wound evolution; quality of life (QoL); cost efficiency (time to ulcer closure, materials used in	individual patient data	Mann-Whitney test; Wilcoxon test	P	P

					treatment, clinician's time, and QOL aspects)				
Haxton	2009	pre-post	retrospective (pre) and prospective (post)	CCA	LOS; midwifery hours; patient satisfaction; staff satisfaction	individual patient data	t-test; χ^2 test	P	P
Muller	2009	pre-post	prospective	CCA	costs of medical examinations and hospital LOS; complication rates; perioperative examinations; readmission rates within 30 days; nursing activities	individual patient data	χ^2 test or Fisher exact test; Mann-Whitney test;	P	P
Verdú	2009	pre-post	retrospective (pre) and prospective (post)	CCA	LOS; hospitalisation costs; care indicators only measured in CPW period (degree of implementation, degree of compliance, adverse events and patient satisfaction);	individual patient data	t-test; χ^2 test or Fisher exact test	P	P

Nicasio	2010	pre-post	retrospective (pre) and prospective (post)	CCA	VAP-related length of treatment; ICU and hospital LOS; infection-related and crude mortality rates; hospitalization cost; antibiotic cost;	individual patient data	t-test; χ^2 test or Fisher exact test; Mann-Whitney U test; generalised linear modelling with log Gaussian dependent variable;	P	P
Hoverman	2011	case-control	retrospective	CCA	disease free survival (DFS); overall survival (OS); therapy duration; rate of chemotherapy-related hospitalisations; direct medical cost; direct medical use;	individual patient data	Kaplan-Meier survival analysis; Wilcoxon test	P	P
Krummenauer	2011	pre-post	prospective	CEA	marginal cost-effectiveness ratios (MCERs); individual $MCER \leq EUR 100/\% WOMAC$ index increase	individual patient data	Fisher exact test; Wilcoxon test; sign tests; multiple logistic regression	0	1

Duncan	2013	pre-post	retrospective	CCA	LOS; clinical outcomes (VAS pain scores, opioid requirements, opioid-related adverse events); institutional cost	individual patient data	t-test	P	P
Kreys	2013	pre-post	retrospective	CCA	compliance (defined as site attainment of pre-specified annual thresholds for chemotherapy and supportive care use); savings determined by comparing per- patient changes in drug and hospital costs through year 2 (with projected annual expenditure increases of 12% and 7% respectively)	claims data	t-test	0	P
Deng	2014	case- control	prospective	CCA	LOS; hospitalisation and drugs costs; 90-day incidence of stroke (TIA only); infection and mortality rates (ICH only); NIHSS score (ICH only); Barthel index (ICH only);	individual patient data	t-test; χ^2 test	P	P

He	2015	case-control	retro	CCA	LOS; total drug and examination costs; cost per day	individual patient data	descriptive statistics; count regression; ordinary linear regression	I	I
Pershad	2015	modelling	modelling	CEA	cost-effectiveness (ICER and NMB) of the following diagnostic strategies: clinical judgement alone; USG on all patients; CT on all patients; overnight observation with surgical evaluation without studies; LeB-P (CPW)	Published literature	decision tree model	P	I
Holderried	2016	pre-post	prospective	CCA	adherence/compliance rate to CPW; LOS; costs; complications; mortality; nursing workload per hospitalised day	individual patient data	t-test; χ^2 tests; Mann-Whitney test	P	P
Rutman	2016	pre-post	retro	CCA	ED LOS; hospital LOS; costs; process measures (% with asthma order	individual patient data	statistical process control; interrupted time	P	P

					set activated, % eligible patients receiving IV magnesium sulphate in ED, % receiving ipratropium bromide in inpatient unit, % receiving recommended steroid prescriptions at hospital discharge); balancing measures (% admitted to hospital, unplanned returns to ED and inpatient units)		series (ITS) linear regression model		
Wang	2016	pre-post	prospective	CCA	LOS; preoperative LOS; hospital cost; antibiotics prescribed; unscheduled surgery; complications and prognosis;	individual patient data	t-test; χ^2 test; multiple regression analyses; logistic regression ;	P	I

Zhao	2016	pre-post	retrospective (pre) and prospective (post)	CCA	LOS; hospitalisation costs; good clinical outcomes (improvement of consciousness, discharge NIHSS 2 lower than on admission, did not die, discharge NIHSS ≤ 4) incidence of complications; adherence to critical processes (NIHSS evaluation, brain CT/MR, antiplatelet medication, dysphagia evaluation, TCD/carotid artery ultrasound, rehabilitation, removing blood stasis, purgation, acupuncture);	individual patient data	t-tests; χ^2 test; Kruskal-Wallis test; multivariable regression	P	P
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