

TABLE E-1 All Databases and Journals Searched from June 1, 2006 to May 31, 2007

Journal/Database	Total Number of Papers	Total Number of Eligible Papers	Number of Papers Included*
J Bone Joint Surg Am	445	82	19
J Bone Joint Surg Br	314	56	12
Clin Orthop	597	45	4
J Orthop Trauma	111	60	15
Acta Orthop	147	21	5
J Pediatr Orthop	181	26	0
Spine	626	24	6
N Engl J Med	1322	3	0
JAMA	951	7	3
BMJ	1672	5	1
Lancet	1481	1	0
Cochrane Database	622	10	3
Total	8469	340	68

*Following review of titles, abstracts, and level of evidence scores.

TABLE E-2 Current Evidence in Orthopaedic Trauma

Level of Evidence	Sample Size	Summary	Funding Status
Therapy*			
I	132	Operative fixation of a displaced fracture of the clavicular shaft resulted in improved functional outcome and a lower rate of malunion and nonunion compared with nonoperative treatment at one year of follow-up.	OTA, Zimmer
I	82	Because percutaneous reduction and application of a circular fixator resulted in a shorter hospital stay, a marginally faster return of function, and similar clinical outcomes and because the number and severity of complications were much higher with open reduction and internal fixation, the authors believed that circular external fixation is an attractive option for these difficult-to-treat bicondylar tibial plateau fractures.	Smith and Nephew, Ltd.; Simon Fraser Orthopaedic Fund
I	81	Total hip arthroplasty conferred superior short-term clinical results and fewer complications when compared with hemiarthroplasty in this prospectively randomized study of mobile, independent patients who had sustained a displaced fracture of the femoral neck.	Not funded.
I	244	The addition of rhBMP-2 to the treatment of type-III open tibial fractures significantly reduced the frequency of bone-grafting procedures and other secondary interventions. This analysis establishes the clinical efficacy of rhBMP-2 combined with an absorbable collagen sponge implant for the treatment of these severe fractures.	Wyeth Research/Genetics Institute and Medtronic Sofamor Danek
I	121	The authors could not recommend the routine use of indomethacin for prophylaxis against heterotopic ossification after isolated fractures of the acetabulum.	Not funded.
I	66	External fixation was superior to sliding hip screws for the treatment of trochanteric fractures of the femur in the study population because it could be done under local anesthesia, required less operative time, caused less blood loss, required a shorter hospital stay, cost less, and resulted in equivalent union rates, complication rates, and final functional outcomes.	Not funded.
I	57	The authors recommended an expandable nail for the treatment of tibial shaft (AO type-A and B) fractures.	Not funded.
I	80	The comprehensive balanced nutrition supplement resulted in lower complication rates and mortality at 120 days postoperatively.	Medical Faculty of Lund University, the County of Skane, and the Swedish National Board of Health and Welfare
I	38	For moderately or severely displaced distal radial fractures in the elderly, non-wrist-bridging external fixation had no clinically relevant advantage over wrist-bridging fixation but was more effective for maintaining radial length.	Not funded.

I	2,289	This study indicated that primary arthroplasty should be used in most patients with a displaced femoral neck fracture. The healthy, lucid individual who is seventy to eighty years old should be managed with a total hip arthroplasty. The older, impaired or institutionalized patient would benefit from a hemiarthroplasty.	Not funded.
I	34	This study indicated that patients with a type-A3 thoracolumbar spine fracture without neurologic deficit should be managed with short-segment posterior stabilization.	Not funded.
I	58	The short-term results of short segmental fixation without fusion for surgically treated burst fractures of the thoracolumbar spine were satisfactory.	Not funded.
I	1099	Women who discontinued alendronate after five years showed a moderate decline in bone mineral density and a gradual rise in biochemical markers but no higher fracture risk other than for clinical vertebral fractures compared with those who continued to receive alendronate.	Merck & Co
II	30	This study suggested that rhBMP-2/allograft is safe and is as effective as traditional autogenous bone-grafting for the treatment of tibial fractures associated with extensive traumatic diaphyseal bone loss.	Not funded.
II	9 studies (meta-analysis)	Functional outcome among patients who presented with leg-threatening injuries were not significantly different, at least up to seven years, whether they were managed with limb salvage or primary amputation.	Not funded.
II	108	A femoral nail specially designed for trochanteric insertion resulted in equally high union rates, equally low complication rates, and functional results similar to conventional antegrade femoral nailing through the piriformis fossa.	Smith & Nephew
II	554	Reoperation did not lead to a worse clinical outcome or to increased mortality in patients with trochanteric fractures.	Not funded.
II	43 studies	This study provided some evidence that multifaceted interventions performed in the hospital reduce the number of falls and that use of hip protectors in care homes prevents hip fractures.	Department of Health Accidental Injury Prevention Programme
II	1727	This study provided some evidence regarding the effectiveness of oral protein and energy feeds, but overall the evidence for the effectiveness of nutritional supplementation remains weak.	Cochrane Collaboration
II	2694	Internal fixation was associated with less initial operative trauma but with an increased risk of reoperation on the hip.	Cochrane Collaboration
II	1920	This study provided limited evidence that cementing a prosthesis in place may reduce postoperative pain and lead to better mobility.	Cochrane Collaboration
III	51	For extra-articular distal-third diaphyseal humeral fractures, operative treatment achieved more predictable alignment and a potentially quicker return of function but was associated with the risks of iatrogenic nerve injury and infection and the need for reoperation.	AO Foundation

III	18	Anteromedial fractures of the coronoid were associated with either subluxation or complete dislocation of the elbow in most patients. Secure fixation of the coronoid fracture usually restored good elbow function.	AO Foundation; Wright Medical Inc.; Joint Active Systems; Stichting Anna-Fonds (Dutch Orthopaedic Research)
III	40	RhBMP-7 enhanced the union of distal tibial fractures treated with external fixation.	Not funded.
III	76 studies	This study provided evidence that balloon kyphoplasty and vertebroplasty are effective therapies in the management of patients who have symptomatic osteoporotic vertebral compression fractures that are refractory to conventional medical therapy.	Kyphon Inc
IV	54	The variable-axis locking plates performed well, with a high rate of fracture union and no evidence of varus collapse due to failure of the polyaxial screw fixation, in a series of complex fractures about the knee.	Not funded.
IV	50	The results of this study supported the use of indirect open reduction and internal fixation with a single extraperiosteal lateral plate, without the use of allograft struts, for the treatment of a femoral shaft fracture about a stable intramedullary implant.	Not funded.
IV	23	This study indicated that intra-articular osteotomy can be performed with acceptable safety and efficacy, improves wrist function, and may help to limit the need for salvage procedures such as partial or total wrist arthrodesis.	AO Foundation
IV	41	Medial and lateral plate stabilization of comminuted bicondylar tibial plateau fractures through medial and lateral surgical approaches was found to be a useful treatment method; however, residual dysfunction was common.	Not funded.
IV	20	Fractures of the dorsal articular margin of the distal part of the radius with dorsal radiocarpal subluxation were accompanied by a spectrum of volar injuries, including ligament injuries, avulsion fractures, and impaction of the articular surface. Despite the relative complexity of these injuries, satisfactory wrist function was achieved with operative treatment in most patients.	Not funded.
IV	54	The authors considered external fixation of displaced intra-articular calcaneal fractures to be a valid alternative treatment compared with open reduction and internal fixation.	Not funded.
IV	51	Nonreamed nailing was associated with high union rates, few complications, and limited indications for secondary procedures in the treatment of segmental tibia fractures.	Not funded.
IV	24	Patients had a low complication rate compared with that for historical controls, which suggested that the Less Invasive Stabilization System may be an appropriate treatment alternative for femoral fractures associated with stable hip or knee prostheses.	Not funded.

IV	34	Open reduction and stable fixation of the greater tuberosity along with rotator cuff repair, when present, allowed for early passive motion of the joint, yielded excellent final results in approximately three quarters of the patients, and restored the ability to return to full activities of daily living.	Not funded.
IV	37	Locking plates have assumed a prominent role in the treatment of proximal tibial fractures. In this series of high-energy fractures, the rate of infection and malalignment was significant enough to be a cause for concern.	Not funded.
IV	49	Infection and nonunion rates with the use of negative pressure wound therapy for temporary coverage of wounds associated with grade/type III open tibial shaft fractures were similar to those for historical controls, but this technique may be beneficial for decreasing the need for free tissue transfer or rotational muscle flap coverage.	Not funded.
IV	109	The long-term results of open reduction and internal fixation for the treatment of tibial plateau fractures were excellent, independent of the patient's age.	Not funded.
IV	80	Anterior-inferior plating of acute middle-third fractures of the clavicle and clavicular nonunions using a plate and lag screws typically resulted in early healing, few complications, and an excellent return of function.	Not funded.
IV	49	This study indicated that proximal-third long oblique fractures may be at greater-than-average risk for nonunion after functional fracture bracing.	AO Foundation, Wright Medical, and Joint Active Systems
IV	78	This study confirmed the high overall rate of union of humeral shaft fractures and an acceptable functional outcome after successful fracture-brace treatment.	Trygg Hansa Insurance Company Fund and Department of Orthopedics at Stockholm Söder Hospital
IV	35	Proximal tibial fractures healed despite open manipulations. Short-plate fixation to maintain this difficult reduction, either temporary or permanent, was effective.	Not funded.
IV	19	Clinical outcome scores for isolated closed displaced intra-articular calcaneal fractures treated nonoperatively deteriorated in the second decade after the injury.	Not funded.
IV	18	Lumbopelvic fixation provided reliable fracture stability and allowed consistent fracture union without loss of alignment.	Not funded.
IV	20	The majority of patients with open clavicular fractures had rapid and uneventful healing after surgical treatment.	Not funded.
IV	15	Hip muscle strength after operative treatment of a displaced acetabular fracture directly influenced patient outcome.	Not funded.
IV	23	This study indicated that reconstruction of comminuted radial head fractures can be performed with the new Fragment Fixation System (Orthofix, Bussolengo, Italy), and radial head resection can be avoided.	Not funded.
IV	63	Clavicle hook-plate fixation of unstable lateral clavicle fractures resulted in a good union rate and good shoulder function.	Not funded.

Prognosis†			
I	252	Recurrent instability and deficits of shoulder function are common after primary nonoperative treatment of an anterior shoulder dislocation. This study demonstrated substantial variation in the risk of instability, with younger males having the highest risk and females having a much lower risk.	Not funded.
I	4000	Patient age, metaphyseal comminution of the fracture, and ulnar variance were the most consistent predictors of radiographic outcome. Dorsal angulation was not found to be a significant predictor of radiographic outcome for displaced fractures.	Wishbone Trust
I	56	There was no significant association between the presence of medial tenderness and deep deltoid ligament incompetence.	Not funded.
I	100	This study indicated that changes in the vertebral wedging rate between the supine and standing positions and its association with back pain may give a clue to the pathogenesis of pain from osteoporotic thoracolumbar vertebral compression fractures.	Not funded.
I	32	Unstable fractures of the sacrum are frequently associated with additional injuries. In this study, these injuries still had a significant effect on morbidity one year after injury.	Ullevål Foundation and Smith & Nephew
I	1242	After an initial low-trauma fracture, the absolute risk of subsequent fracture was similar for men and women. This increased risk occurred for virtually all clinical fractures and persisted for up to ten years.	National Health & Medical Research Council grant (federal granting body), Merck Sharp and Dohme, Eli Lilly, and GE Lunar Corporation
II	214	The authors concluded that patients with a preoperative or intraoperative fracture of the lateral femoral wall are not treated adequately with a sliding compression hip-screw device and that intertrochanteric fractures should therefore be classified according to the integrity of the lateral femoral wall, especially in randomized trials comparing fracture implants.	IMK-Foundation
II	91	This study indicated that high-risk patients should have routine radiographic follow-up. Such a routine could identify a loose implant and make intervention possible before a fracture occurs. Furthermore, the authors recommended an exploration of the joint to test the stability of the implant in patients with a Vancouver type-B fracture in which the stability of the stem is uncertain.	Göteborgs Läkaresällskap, Felix Neuberghs stiftelse
II	237	The time to surgery was a significant predictor of radiographic and functional outcome for both elementary and associated displaced fractures of the acetabulum.	Not funded.
II	250	Patients over the age of ninety-five years were unlikely to recover their independence.	Not funded.
II	24	The only significant risk factors identified for the failure of nonoperative treatment were the craniocaudal height of the fracture fragment and the relative height of the fracture fragment expressed as a percentage of the intact lateral mass.	Not funded.
III	148,942	Long-term proton pump inhibitor therapy, particularly at high doses, was associated with an increased risk of hip fracture.	American Gastroenterological Association and Glaxo-SmithKline Glaxo Institute

IV	47	The following factors were found to be correlated with a poor clinical outcome: Bado type-II fracture, Jupiter type-IIa fracture, fracture of the radial head, coronoid fracture, and complications requiring further surgery.	Not funded.
IV	13	This study suggested that prolonged suppression of bone remodeling with alendronate may be associated with a new form of insufficiency fracture of the femur.	Not funded.
IV	109	The quality of the reduction of the fracture was the most important variable in forecasting the outcome for patients with this injury. The interval to reduction of the dislocation of the hip may be less important than previously described.	Stryker Orthopaedics
IV	128	The authors found that patients with simple and associated fractures of the posterior wall of the acetabulum had severe functional deficits as measured with the Short Form-36 and Musculoskeletal Functional Assessment scores at a mean of four years after the injury. Functional outcome was significantly worse in patients with radiographic arthritis and in those with associated posterior wall and posterior-column fractures.	AO-ASIF Foundation
Diagnosis‡			
II	286	In the presence of a femoral shaft fracture, evaluation of the femoral neck with fine-cut computed tomography and dedicated internal rotation hip radiographs significantly improved the ability to diagnose an associated femoral neck fracture.	Not funded.
II	30	Three-dimensional reconstructions improved the reliability, but not the accuracy, of fracture classification and characterization.	AO Foundation
III	30	Three-dimensional computed tomography improved both the reliability and the accuracy of radiographic characterization of articular fractures of the distal part of the radius and influenced treatment decisions.	AO Foundation
III	30	This study evaluated the use of a systematic, binary method for the classification of acetabular fractures. Five of the eight criteria appeared reliable when assessed by means of interobserver and intraobserver error. The remaining three require further refinement.	Not funded.
IV	79	This study indicated that classification on the basis of plain radiographs often underestimates the true extent of the injury and that computed tomography may be of benefit in preoperative planning, especially for patients over sixty years of age.	Not funded.

*Investigating the results of a treatment. †Investigating effect of patient characteristic on the outcome of a disease.

‡Investigating a diagnostic test