

Supplemental Digital Appendix 1

46 Health Care Problems and the Corresponding 59 Practice Indicators Expected of All Physicians Entering or in Practice

Infectious and parasitic diseases

Problem	Practice indicator	% recommending assessment format		
		Written	Performance	Practice
Prevention				
Avoidable complications/death from preventable infectious diseases in adolescents	Prescribe appropriate immunizations for adolescents ²¹	71-80	71-80	0
Avoidable complications/death from preventable infectious diseases in children	Prescribe childhood immunization as per guidelines ²¹	81-90	0	0
Failure to reduce the risk of influenza in high risk patients	Prescribe influenza vaccinations in high-risk patients ²³	91-100	71-80	71-80
	Prescribe seasonal influenza vaccination for pneumonia patients ²⁷	91-100	71-80	71-80
Best clinical practice				
Failure to diagnose and treat strep pharyngitis in children	Order strep test for sore throat in children as per guidelines ²¹	81-90	81-90	91-100
	Prescribe appropriate antibiotics for children with pharyngitis ²¹	91-100	81-90	91-100
Potentially inappropriate antibiotic prescription	Order blood cultures in emergency department prior to initial antibiotics for pneumonia patients ²²	71-80	71-80	81-90
Optimal/efficient resource utilization				
Overuse of antibiotics for adults with viral upper respiratory infection	Avoid prescribing antibiotics for acute bronchitis in adults ²¹	71-80	91-100	91-100
Overuse of antibiotics for children with viral upper respiratory infection	Avoid prescribing antibiotics for viral upper respiratory infection in children 3 months to 18 years ²¹	0	81-90	81-90

Neoplasms

Problem	Practice indicator	% recommending assessment format		
		Written	Performance	Practice
Prevention				
Avoidable delays in the diagnosis and treatment of breast cancer	Screen for breast cancer ²¹	71-80	71-80	81-90
	Recognize limitations of mammography by performing breast examinations and repeated mammography ⁵⁸	71-80	0	81-90
Avoidable delays in the diagnosis and treatment of cervical cancer	Screen for cervical cancer ²¹	71-80	0	81-90
Avoidable delays in the diagnosis and treatment of colorectal cancer	Refer high risk patients for colorectal cancer for investigation and management ⁶³	81-90	71-80	81-90
	Screen for colorectal cancer in high risk patients ⁶³	71-80	0	81-90

Diseases of the cardiovascular system

Problem	Practice indicator	% recommending assessment format		
		Written	Performance	Practice
Prevention				
Avoidable complications and death in patients with congestive heart failure (CHF)	Prescribe pneumococcal immunization for patients with congestive heart failure ⁴⁹	81-90	0	71-80
Failure to intervene to modify a risk factor for coronary artery disease patients	Assess LDL-cholesterol levels for coronary artery disease patients ^{21,22}	91-100	81-90	81-90
Failure to intervene to modify a risk factor for myocardial infarction recurrence.	Prescribe smoking cessation treatment and counseling during hospital stay ²²	0	71-80	71-80
Preventable complications and death in patients with chronic or recurrent atrial fibrillation	Prescribe anticoagulants for appropriate patients with chronic or recurrent atrial fibrillation ⁴⁹	91-100	81-90	71-80
Best clinical practice				
Avoidable complications/death from	Recognize abdominal aortic aneurysm ^{17,57}	0	71-80	0

abdominal aortic aneurysm	Refer patients with suspected abdominal aortic aneurysm ^{17,57}	71-80	71-80	0
Avoidable deterioration of cardiac function	Prescribe ACE-inhibitor or angiotensin receptor blockers (ARB) at discharge for patients with systolic dysfunction ^{22,49-51,53}	91-100	91-100	81-90
Avoidable deterioration or death in patients with acute myocardial infarction (at arrival)	Prescribe aspirin at arrival for acute myocardial infarction patients ^{22,50}	71-80	81-90	81-90
	Administer fibrinolytic therapy or reperfusion thrombolysis within 30 minutes of hospital arrival ^{22,49,50}	71-80	81-90	81-90
	Administer primary percutaneous coronary intervention (PCI) within 90 minutes of hospital arrival ^{22,50}	0	91-100	71-80
Avoidable deterioration, recurrence, or death in patients with acute myocardial infarction (at discharge).	Prescribe aspirin at discharge for acute myocardial infarction patients ^{22,49-51}	71-80	71-80	81-90
	Prescribe lipid-lowering therapy ²²	81-90	71-80	81-90
	Prescribe beta blockers at hospital discharge to acute myocardial infarction patients ^{22,50}	91-100	81-90	81-90
Avoidable deterioration or death in heart failure patients	Evaluate left ventricular systolic function for heart failure patients ^{22,49}	0	71-80	91-100
Efficient communication				
Avoidable deterioration or death in heart failure patients	Give heart failure patients written instructions on activity, diet, medications, follow-up, weight monitoring, and what to do if symptoms worsen ^{22,49}	0	71-80	71-80

Diseases of the respiratory system

		% recommending assessment format		
Problem	Practice indicator	Written	Performance	Practice
Prevention				
Failure to reduce the risk of recurrence of pneumonia in high risk patients	Prescribe pneumococcal vaccination at discharge for pneumonia patients ^{22,49}	71-80	0	71-80

Failure to intervene to modify a risk factor for chronic pulmonary problems	Prescribe smoking cessation treatment and counseling for pneumonia patients ²²	0	81-90	71-80
Best clinical practice				
Avoidable deterioration of pneumonia patients	Prescribe antibiotic treatment within hours of arrival for pneumonia patients ²²	71-80	0	91-100
Avoidable deterioration or death in asthma patients having an acute exacerbation	Prescribe fast-acting beta-agonists (bronchodilators) for asthma patients having an acute exacerbation ^{21,22}	71-80	91-100	81-90
	Prescribe systemic corticosteroids for asthma patients having an acute exacerbation ^{21,22}	81-90	91-100	91-100
Efficient communication				
Avoidable recurrence of exacerbation in asthma patients	Prescribe discharge home management plan of care for asthma patients ²²	0	0	71-80

Endocrine problems

Problem	Practice indicator	% recommending assessment format		
		Written	Performance	Practice
Best clinical practice				
Avoidable complications in diabetic patients	Monitor glycemic control using periodic HbA1C blood tests ²¹⁻²³	0	0	81-90

Genitourinary diseases

		% recommending assessment format		
Problem	Practice indicator	Written	Performance	Practice
Best clinical practice				
Avoidable delays in the diagnosis and treatment of chlamydia in women	Screen for chlamydia in women 15 to 30 years of age ²¹	0	0	81-90

Pregnancy

Problem	Practice indicator	% recommending assessment format		
		Written	Performance	Practice
Best clinical practice				
Avoidable complications from ectopic pregnancy	Recognize ectopic pregnancy ⁵⁹	0	71-80	71-80

Injury and poisoning: cross specialty issues

Problem	Practice indicator	% recommending assessment format		
		Written	Performance	Practice
GENERAL				
Prevention				
Preventable hospital-acquired pressure ulcers	Assess risk and skin for hospital-acquired pressure ulcers ^{23,26}	0	0	91-100
Preventable ventilator-associated pneumonia (VAP)	Order deep venous thrombosis (DVT) prophylaxis (unless contraindicated) ^{23,24,28,30,32}	0	0	81-90
Best clinical practice				
Avoidable deterioration from existing complications	Intervene rapidly when a complication is present ²⁵	0	0	91-100
Misplaced naso or gastric tube not detected prior to use	Use pH strip test or x-rays for naso or gastric tube placement ¹⁹	0	0	91-100
Avoidable complications or death from anaphylaxis	Treat anaphylactic reactions ⁶⁰	71-80	91-100	81-90
Optimal/efficient resource utilization				
Delayed diagnostic or therapeutic response to abnormal test results	Respond to lab results in a timely fashion ^{23,24}	0	0	91-100
Efficient communication				
Failure to obtain life-sustaining or do not resuscitate (DNR) orders	Obtain patient's preference for life-sustaining treatments on his or her chart ²³	0	71-80	91-100
Inappropriate or untimely	Document and transmit critical clinical patient	0	0	91-100

transmission of patient care information during transitions in care

care information to patients and health care providers within and between institutions²³

DRUG/THERAPY RELATED

Prevention

Avoidable hemorrhagic complications for patients on warfarin	Monitor INR for patients on warfarin ^{23,61}	71-80	0	71-80
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Best clinical practice

Preventable drug-related adverse events	Avoid drug interactions ^{23,24,52,64}	71-80	81-90	91-100
	Do not duplicate medications ^{23,24,52,64}	0	0	81-90
	Monitor for drug side effects ^{23,24,52,64}	0	0	81-90
	Prescribe appropriate medication dosage ^{23,24,52,64}	0	81-90	91-100
Avoidable complications and death from patient falls	Avoid prescribing medications that produce central nervous side effects in patients who are at risk for falling ^{24,25}	71-80	81-90	81-90

Efficient communication

Patient receiving wrong medication or dose	Read-back verbal medication orders ^{23,24}	0	0	0
Preventable drug-related adverse events during transitions in care	Reconcile medication during handoffs or patient transfers ^{28,53,54}	0	71-80	81-90
Overdose of radiation for pediatric patients	Specify "pediatric" when ordering imaging for pediatric patients ²³	0	0	91-100

Injury and poisoning: surgical patients

		% recommending assessment format		
Problem	Practice Indicator	Written	Performance	Practice
Best clinical practice				
Poorly managed post-operative pain	Manage post-operative pain ³²	0	81-90	91-100

Injury and poisoning: infections and sepsis

Problem	Practice Indicator	% recommending assessment format		
		Written	Performance	Practice
Prevention				
Preventable urinary tract infections due to overextended use of urinary catheter	Order timely removal of urinary catheter when no longer needed ²³	0	0	81-90
Transmission of infection due to poor hand hygiene	Ensure adequate hand hygiene ²³	0	0	91-100
Avoidable complications or death in asplenic patients	Suspect sepsis in asplenic patients ⁶²	81-90	0	71-80

Supplemental Digital Appendix 2

21 Health Care Problems and the Corresponding 31 Practice Indicators Expected of Physicians Entering or in Specialty Practice

Injury and poisoning: cross specialty issues

Problem	Practice indicator	% recommending assessment format		
		Written	Performance	Practice
GENERAL				
Best clinical practice				
Preventable hospital-acquired pressure ulcers	Manage hospital-acquired pressure ulcers ^{23,25,26}	0	0	81-90
Optimal/efficient resource utilization				
Avoidable medical equipment related adverse events	Know how to use medical equipment before using it (e.g., IV pump, defibrillator) ^{24,25}	0	0	91-100
Efficient communication				
Avoidable delays in diagnosis and treatment	Ensure proper labeling and handling of specimens and reports ⁶⁵	0	0	70-80
DRUG/THERAPY RELATED				
Best clinical practice				
Avoidable drug-related adverse events in chemotherapy	Ensure proper administrative route for chemotherapy ¹⁹	0	0	81-90
Avoidable potassium chloride related adverse events	Prescribe or use commercially prepared ready-to-use diluted solutions containing potassium; when commercially unavailable, order pharmacy prepared solution ¹⁹	0	0	81-90

Injury and poisoning: infections and sepsis

Problem	Practice indicator	% recommending assessment format		
		Written	Performance	Practice
Best clinical practice				
Preventable septicemia from inadequate care of central line	Access lumens aseptically ^{23,31}	0	0	0
	Conduct daily assessment of central line necessity ^{23,31}	0	0	70-80
	Use dedicated lumen for total parenteral nutrition ^{23,31}	0	0	0
Preventable ventilator-associated pneumonia (VAP)	Assess readiness to extubate ^{23,24,28,30,32,55}	0	0	91-100
	Order CASS-ETTUBE tubes for drainage of subglottic secretions ^{23,24,28,30,32,55}	0	0	0
	Order daily "sedation vacation" ^{23,24,28,30,32,55}	0	0	70-80
	Order head of bed elevation ^{23,24,28,30,32,55}	0	0	91-100
	Prescribe peptic ulcer disease prophylaxis ^{23,24,28,30,32,55}	0	0	81-90

Injury and poisoning: surgical patients

Problem	Practice indicator	% recommending assessment format		
		Written	Performance	Practice
INFECTIOUS PROBLEMS				
Prevention				
Avoidable surgical site infections	Order clipper, depilatory, or no hair removal around surgical site; avoid razor ^{18,22,23,28,29,32}	0	0	70-80
Failure to prevent surgery-related infections for high risk patients	Prescribe prophylactic antibiotics treatments as per guidelines ^{18,22,29,32}	91-100	81-90	81-90
Best clinical practice				
Inappropriate duration of antibiotic treatment for surgical patients	Discontinue prophylactic antibiotics treatments within 24 hours after surgery as per guidelines ²²	81-90	0	91-100
INTRAOPERATIVE ISSUES				
Best clinical practice				
Avoidable complications from	Recognize when to leave skin open to heal ⁵⁶	0	0	91-100

premature closure of a wound

Efficient communication

Avoidable wrong-site surgery	Identify clearly patient name (ID) and operative site ^{19,24,32}	0	0	91-100
Avoidable complications from foreign bodies left in surgical patients.	Count instruments before closing surgical site ^{19,24,25}	0	0	81-90

POSTOPERATIVE CARE

Best clinical practice

Avoidable postoperative hyper or hypoglycemia for cardiac surgery patients.	Evaluate postoperative AM blood glucose levels for cardiac surgery patients on postoperative days 1 & 2 ^{22,28,29}	0	0	91-100
Avoidable deterioration from surgical complications	Manage postoperative hemorrhage or hematoma ²⁵	0	0	91-100
	Manage postoperative physiologic and metabolic derangement ²⁵	0	0	91-100
	Manage wound dehiscence ^{25,56}	0	0	91-100
	Manage postoperative respiratory failure ²⁵	0	0	91-100
	Manage postoperative sepsis ^{24,25}	0	0	91-100

Efficient communication

Preventable postoperative adverse events	Write immediate postoperative orders regarding specific directives for patient care ³²	0	0	91-100
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Diseases of the cardiovascular system

Problem	Practice indicator	% recommending assessment format		
		Written	Performance	Practice
Best clinical practice				
Avoidable cardiac adverse events for surgical patients on beta blockers	Maintain betablockers perioperatively for patients on betablockers ²²	81-90	81-90	91-100
Preventable peri or postoperative ischemic cardiac problem including cardiac arrest	Prescribe preoperative beta-blockers for patient at high risk of perioperative ischemia ³²	91-100	70-80	81-90

Preventable pre and postoperative deep vein thrombosis (DVT) and pulmonary embolism (PE)	Prescribe pre and postoperative DVT and PE prophylaxis ^{22,24,25,28,32}	70-80	0	91-100
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Pregnancy

Problem	Practice indicator	% recommending assessment format		
		Written	Performance	Practice
Best clinical practice				
Avoidable complications from cesarean delivery	Recognize appropriate need for cesarean delivery ^{24,25}	0	0	91-100
Avoidable complications from ectopic pregnancy	Manage ectopic pregnancy in a timely manner ⁵⁹	0	0	81-90