Key Components of the Research Question
PICOT

CONTEXT: Low birth weight is implicated as a risk factor for type 2 diabetes. However, the strength, consistency, independence, and shape of the association have not been systematically examined.

OBJECTIVE: To conduct a quantitative systematic review examining published evidence on the association of birth weight and type 2 diabetes in adults. JAMA. 2008 Dec 24;300(24):2886-97

<table>
<thead>
<tr>
<th>Components</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>Adults (studies of adults)</td>
</tr>
<tr>
<td>Intervention (Exposure)</td>
<td>Low birthweight</td>
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<tr>
<td>Comparator (if applicable)</td>
<td>Normal (?+high) birthweight</td>
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<tr>
<td>Outcome</td>
<td>Type 2 diabetes</td>
</tr>
<tr>
<td>Timeframe</td>
<td>?Within the first 70 yrs of life (published between 19xx to 2008)</td>
</tr>
</tbody>
</table>
Examples of Research Questions

CONTEXT: Low birth weight is implicated as a risk factor for type 2 diabetes. However, the strength, consistency, independence, and shape of the association have not been systematically examined. **OBJECTIVE:** To conduct a quantitative systematic review examining published evidence on the association of birth weight and type 2 diabetes in adults. *JAMA.* 2008 Dec 24;300(24):2886-97

CONTEXT: Despite concerns about drug safety, current information on older adults’ use of prescription and over-the-counter medications and dietary supplements is limited. **OBJECTIVE:** To estimate the prevalence and patterns of medication use among older adults (including concurrent use), and potential major drug-drug interactions. *JAMA.* 2008 Dec 24;300(24):2867-78

CONTEXT: Coronary artery calcification is a subclinical predictor of coronary heart disease. Recent studies have found that sleep duration is correlated with established risk factors for calcification including glucose regulation, blood pressure, sex, age, education, and body mass index. **OBJECTIVE:** To determine whether objective and subjective measures of sleep duration and quality are associated with incidence of calcification over 5 years and whether calcification risk factors mediate the association. *JAMA.* 2008 Dec 24;300(24):2859-66

CONTEXT: Clinical trials using antihyperglycemic medications to improve glycemic control have not demonstrated the anticipated cardiovascular benefits. Low-glycemic index diets may improve both glycemic control and cardiovascular risk factors for patients with type 2 diabetes but debate over their effectiveness continues due to trial limitations. **OBJECTIVE:** To test the effects of low-glycemic index diets on glycemic control and cardiovascular risk factors in patients with type 2 diabetes. *JAMA.* 2008 Dec 17;300(23):2742-53

CONTEXT: A number of previous studies have reported an inverse association between maternal smoking and preeclampsia. Additionally, some have suggested that smokers who develop preeclampsia have worse maternal and fetal outcomes than nonsmokers who develop preeclampsia. **OBJECTIVE:** The authors examined the relation of smoking to preeclampsia among 674,250 singleton pregnancies in New York City between 1995 and 2003. *American Journal of Epidemiology* 2009 169(1):33-40.
Examples of Research Questions

CONTEXT: Identifying effective obesity treatment is both a clinical challenge and a public health priority due to the health consequences of obesity. OBJECTIVE: To determine whether common decision errors identified by behavioral economists such as prospect theory, loss aversion, and regret could be used to design an effective weight loss intervention. JAMA. 2008 Dec 10;300(22):2631-7.

CONTEXT: Mental health services are typically subject to higher cost sharing than other health services. In 2008, the US Congress enacted legislation requiring parity in insurance coverage for mental health services in group health plans and Medicare Part B. OBJECTIVE: To determine the relationship between mental health insurance parity and the use of timely follow-up care after a psychiatric hospitalization. JAMA. 2008 Dec 24;300(24):2879-85.

CONTEXT: Use and abuse of prescription narcotic analgesics have increased dramatically in the United States since 1990. The effect of this pharmacoepidemic has been most pronounced in rural states, including West Virginia, which experienced the nation's largest increase in drug overdose mortality rates during 1999-2004. OBJECTIVE: To evaluate the risk characteristics of persons dying of unintentional pharmaceutical overdose in West Virginia, the types of drugs involved, and the role of drug abuse in the deaths. JAMA. 2008 Dec 10;300(22):2613-20.

CONTEXT: Evidence demonstrates that providing nutritional support to intensive care unit (ICU) patients within 24 hours of ICU admission reduces mortality. However, early feeding is not universally practiced. Changing practice in complex multidisciplinary environments is difficult. Evidence supporting whether guidelines can improve ICU feeding practices and patient outcomes is contradictory. OBJECTIVE: To determine whether evidence-based feeding guidelines, implemented using a multifaceted practice change strategy, improve feeding practices and reduce mortality in ICU patients. JAMA. 2008 Dec 17;300(23):2731-41.

CONTEXT: In adults, light to moderate alcohol consumption is associated with lower risks for heart disease, diabetes, and mortality. OBJECTIVE: This study examined whether light to moderate alcohol use is also associated with lower risk of incident physical disability over two 5-year periods in 4,276 noninstitutionalized adults in the United States, aged 50 years or older, by using data from 3 waves of the National Health and Nutrition Examination Survey Epidemiologic Follow-up Study surveys from 1982 to 1992. American Journal of Epidemiology 2009 169(1):96-104.
Examples of Research Questions

CONTEXT: Rapid response teams have been shown in adult inpatients to decrease cardiopulmonary arrest (code) rates outside of the intensive care unit (ICU). Because a primary action of rapid response teams is to transfer patients to the ICU, their ability to reduce hospital-wide code rates and mortality remains unknown. **OBJECTIVE:** To determine rates of hospital-wide codes and mortality before and after implementation of a long-term rapid response team intervention. *JAMA.* 2008 Dec 3;300(21):2506-13.

CONTEXT: Recent studies of inhaled corticosteroid (ICS) therapy for managing stable chronic obstructive pulmonary disease (COPD) have yielded conflicting results regarding survival and risk of adverse events. **OBJECTIVE:** To systematically review and quantitatively synthesize the effects of ICS therapy on mortality and adverse events in patients with stable COPD. *JAMA.* 2008 Nov 26;300(20):2407-16

CONTEXT: In 2003, Medicare expanded coverage of ventricular assist devices as destination, or permanent, therapy for end-stage heart failure. Little is known about the long-term outcomes and costs associated with these devices. **OBJECTIVE:** To examine the acute and long-term outcomes of Medicare beneficiaries receiving ventricular assist devices alone or after open-heart surgery. *JAMA.* 2008 Nov 26;300(20):2398-406

CONTEXT: In February 2002, the allocation system for liver transplantation became based on the Model for End-Stage Liver Disease (MELD) score. Before MELD, black patients were more likely to die or become too sick to undergo liver transplantation compared with white patients. Little information exists regarding sex and access to liver transplantation. **OBJECTIVE:** To determine the association between race, sex, and liver transplantation following introduction of the MELD system. *JAMA.* 2008 Nov 26;300(20):2371-8

CONTEXT: A common allele on chromosome 9p21 has been repeatedly associated with increased risk of coronary artery disease (CAD) in the general population. However, the magnitude of this effect in the population with diabetes has not been well characterized. **OBJECTIVE:** To examine the association of the 9p21 variant with CAD in individuals with type 2 diabetes and evaluate its interaction with poor glycemic control. *JAMA.* 2008 Nov 26;300(20):2389-97.
Examples of Research Questions

Purpose: The mucosa of the small intestine encompasses about 90% of the luminal surface area of the digestive system, but only 2% of the total annual gastrointestinal cancer incidence in the United States. *Annals of Epidemiology, Volume 19, Issue 1, January 2009, Pages 58-69*

Purpose: This study examined associations of neighborhood social cohesion, violence, and aesthetic quality with depressive symptoms among 2,619 healthy adults aged 45–84 years enrolled in the Multiethnic Study of Atherosclerosis. *Annals of Epidemiology, Volume 19, Issue 1, January 2009, Pages 49-57*

Purpose: We sought to examine the relationship between recent use of oral contraceptives and hormone therapy and endometrial hyperplasia (EH) risk. *Annals of Epidemiology, Volume 19, Issue 1, January 2009, Pages 1-7*

Objective: To demonstrate how mixed models may be used to estimate treatment effects, and inform decisions on the need for monitoring initial response. *Journal of Clinical Epidemiology, In Press, Corrected Proof, Available online 23 December 2008*

Objective: We sought to clarify the validity of self-reported stroke and myocardial infarction (MI) among Japanese population, because information on the validity, particularly on the sensitivity, of self-reported cardiovascular disease is limited and may differ among countries. *Journal of Clinical Epidemiology, In Press, Corrected Proof, Available online 23 December 2008*

Background: Numerous studies have reported associations between the type of feeding during infancy and subsequent cardiovascular risk factors. Only 2 studies have evaluated the relation between having been breastfed and the risk of adult cardiovascular events. **Objective:** We examined this association among 87,252 female participants of the longitudinal Nurses' Health Study. Participants (all born between 1921 and 1946) reported in 1992 whether and for how long they were breastfed. *Epidemiology, 15(5):550-556, September 2004*

Background: Although psychological issues can interfere with diabetes care, the effectiveness of psychological treatments in improving diabetes outcomes is uncertain. **Objective:** To determine whether motivational enhancement therapy with or without cognitive behavior therapy improves glycemic control in type 1 diabetes compared with usual care. *Annals of Internal Medicine. 18 November 2008 | Volume 149 Issue 10 | Pages 708-719*
## Common Pitfalls

<table>
<thead>
<tr>
<th>Problem</th>
<th>Undesirable</th>
<th>Desirable</th>
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</table>
| Poor choice of action verb=Unclear research result | “To examine the acute and long-term outcomes..”  
“We sought to clarify ..”  
“To describe…” | “To estimate the prevalence..”  
“To determine whether motivational enhancement therapy - Improves” |
| Methods in the question clutter intent       | “To systematically review and quantitatively synthesize…”  
“.. objective and subjective measures of sleep duration..”  
“.. by using data from 3 waves of the National Health and Nutrition Examination Survey Epidemiologic Follow-up Study survey..” | Should be in the methods section |
| Justification of research in the question    | “.. because information on the validity, particularly on the sensitivity, of self-reported cardiovascular disease is limited and may differ among countries” | Should be described in the background |
| Expected results rather than a question      | “To demonstrate how mixed models may be used to estimate treatment effects..” | Should be described in belongs in “expected contribution”, “relevance” or “background” |
| Too many Questions, usually at multiple parts of the research cycle | “To estimate the prevalence and severity of asthma, estimate the association between family disruption and asthma severity, and the agreement between self and parental report” | Restrict to the primary question that justifies the “need” for the research, not all questions that “could” be answered |
| Jargon in the research question              | “common decision errors identified by behavioral economists such as prospect theory, loss aversion, and regret ..” | Avoid, and if not possible, introduce in background |