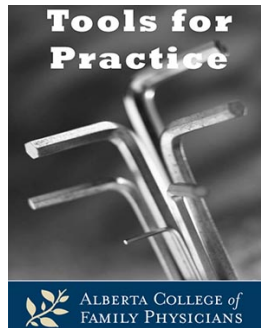


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November 12, 2013



Effectiveness of seasonal influenza vaccine for healthy, working age adults

Clinical Question: Does the trivalent influenza vaccine (flu shot) prevent influenza or its complications in healthy, working age adults?

Bottom-line: For healthy adults, the flu shot reduces influenza when vaccine is well-matched to circulating influenza strains (Numbers Needed to Treat (NNT)=12-37). When vaccine is poorly matched, effectiveness diminishes and may be similar to placebo. The flu shot has not been shown to affect hospitalizations and observational evidence that influenza vaccine decreases mortality is likely biased.

Evidence:

- Meta-analysis of 17 Randomized Controlled Trials (RCTs) of 38,800 predominantly healthy adults (16-65 years) randomized to inactivated trivalent influenza vaccine (flu shot) or placebo/no vaccination.¹
 - Influenza rates:
 - Well-matched vaccine (matches $\geq 80\%$ of circulating virus):
 - Vaccine 1.2%, control 3.9%, NNT=37.
 - Poor or uncertain vaccine match:
 - Vaccine 1.1%, control 2.4%, NNT=77.
 - Number of days ill decreased by $\sim 1/2$ day when vaccine matched but increased by $\sim 2/3$ day when vaccine did not match.
 - The flu shot did not affect hospitalization (assessed in two trials) or pneumonia rates (one trial), and mortality rates were not reported.
 - Systemic adverse effects (fever, myalgias): vaccine 23%, placebo 15%.
 - Limitations: Most studies short term (one influenza season), many evaluated health care workers, children, or influenza epidemics 30 years ago.
- Another systematic review found flu shot decreased influenza in adults (NNT=67).²
- Most generalizable non-industry sponsored placebo-controlled RCT:³
 - 1,191 American factory workers (mean age 44, $\sim 80\%$ males), over two influenza seasons.
 - Influenza rates:

- Well-matched vaccine: vaccine 1.4%, placebo 10.2%, NNT=12.
- Poor vaccine match: no statistical difference.

Context:

- The flu shot includes three influenza strains, updated annually to match predicted strains. In Canada, vaccine was well-matched in only seven of the last 14 years.⁴
- Observational evidence demonstrating that the flu shot reduces hospitalizations and mortality appears biased by healthier patients more often choosing vaccination.⁵⁻⁷
- Canadian and American national immunization committees encourage universal influenza vaccinations.^{8,9}

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