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**Tufail M Malik\***, tufail.malik@kustar.ac.ae, and **M Imran** and **R Jayaraman**. *Optimal control with multiple human papillomavirus vaccines.*

Many hpv vaccination programs now administer three vaccines: bivalent, quadrivalent and the recently marketed nonavalent vaccine. A model will be presented to explore optimal vaccination strategies using the three vaccines, which differ in protection breadth, cross-protection, and type-specific efficacy. Assuming the HPV infection prevalence in the population under the constant vaccination regime, optimal control theory will be used to discuss optimal vaccination strategies for the associated non-autonomous model when the vaccination rates are functions of time. The impact of these strategies on the number of infected individuals and the accumulated cost will be assessed and compared with the constant control case. Switch times from one vaccine combination to a different combination including the nonavalent vaccine will be assessed during an optimally designed HPV immunization program. (Received July 12, 2016)