Postulates of QM

1) $|\psi(t)\rangle$ represents complete state of system
2) $O = O^\dagger$ reprents a measurement

$O|n\rangle = a_n|n\rangle$ - complete & orthonormal basis

3) possible readings of the dial : a_n
4) probability $\wp(a_n) = |\langle n|\psi(t)|^2$
5) If a_n at $t=t_0$, $|\psi(t_0)\rangle = |n\rangle$
6) $i\hbar \frac{d}{dt}|\psi(t)\rangle = \hat{H}|\psi(t)\rangle$

$\hat{H}$ └ hamiltonian

For $\frac{d\hat{H}}{dt} = 0$

$$\rightarrow |\psi(t)\rangle = \exp\left\{-\frac{i}{\hbar}\hat{H}(t-t_0)\right\}|\psi(t_0)\rangle$$

If $\hat{H}|n\rangle = \hbar\omega_n|n\rangle$:

$$\langle n|\psi(t)\rangle = \exp\{-i\omega_n(t-t_0)\}\langle n|\psi(t_0)\rangle$$

$$|\psi(t_0)\rangle = \sum_n \langle n|\psi(t_0)\rangle\ |n\rangle$$

$$|\psi(t)\rangle = \sum_n \langle n|\psi(t)\rangle\ |n\rangle$$

$$= \sum_n \exp\{-i\omega_n(t-t_0)\}\langle n|\psi(t_0)\rangle\ |n\rangle$$