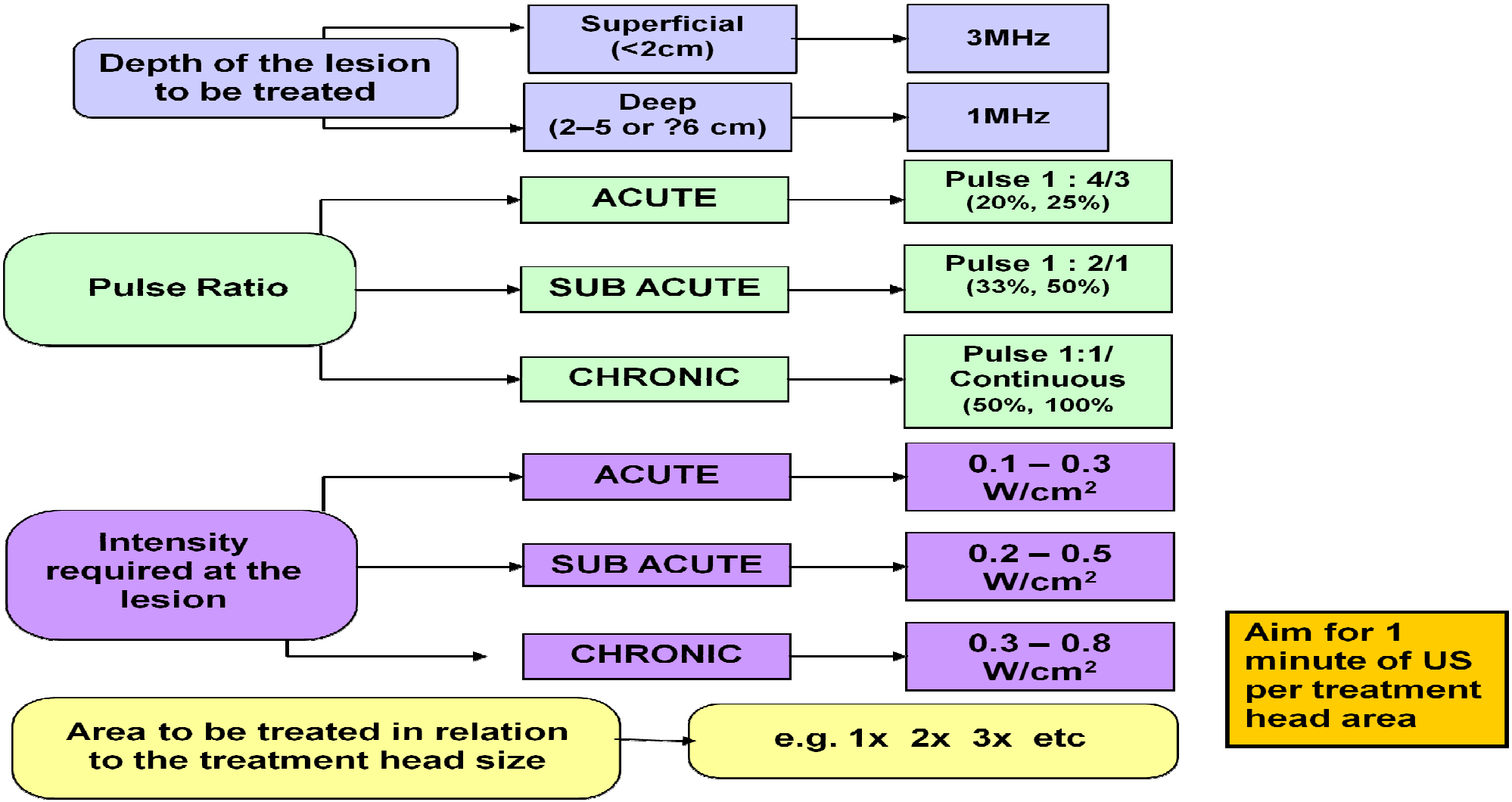
Ultrasound Treatment Dose Calculations © Tim Watson (2009)



Ultrasound treatment principle – 1 minutes worth of ultrasound per treatment head area

Therefore longer if PULSED and longer for LARGER TREATMENT AREAS

Treatment time = 1 x (no of times treatment head fits onto tissue to treat) x (pulse factor)

To determine the PULSE FACTOR, add the two components of the ratio together (i.e. pulse 1:4 adds up to 5, multiply by 5. Pulse 1:1, adds up to 2, multiply by 2

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Mode	Pulse Ratio	Duty Cycle
Continuous		100%
Pulsed	1:1	50%
	1:2	33%
	1:3	25%
	1:4	20%
	1:9	10%

3MHz Ultrasound **1/2 value depth = 2.5cm**

	Depth of Lesion (cm)				
Intensity required at the lesion (W/cm2)	**0.5**	**1**	**2**	**3**	**4**
1	1.20	1.40	1.80	2.20	2.60
0.9	1.08	1.26	1.62	1.98	2.34
0.8	0.96	1.12	1.44	1.76	2.08
0.7	0.84	0.98	1.26	1.54	1.82
0.6	0.72	0.84	1.08	1.32	1.56
0.5	0.60	0.70	0.90	1.10	1.30
0.4	0.48	0.56	0.72	0.88	1.04
0.3	0.36	0.42	0.54	0.66	0.78
0.2	0.24	0.28	0.36	0.44	0.52
0.1	0.12	0.14	0.18	0.22	0.26

Table to indicate the surface intensity (W/cm^2) required to achieve a particular intensity at depth using 3MHz ultrasound

1MHz Ultrasound **1/2 value depth = 4cm**

	Depth of Lesion (cm)						
Intensity required at the lesion (W/cm2)	**0.5**	**1**	**2**	**3**	**4**	**5**	**6**
1	1.13	1.25	1.50	1.75	2.00	2.25	2.50
0.9	1.01	1.13	1.35	1.58	1.80	2.03	2.25
0.8	0.90	1.00	1.20	1.40	1.60	1.80	2.00
0.7	0.79	0.88	1.05	1.23	1.40	1.58	1.75
0.6	0.68	0.75	0.90	1.05	1.20	1.35	1.50
0.5	0.56	0.63	0.75	0.88	1.00	1.13	1.25
0.4	0.45	0.50	0.60	0.70	0.80	0.90	1.00
0.3	0.34	0.38	0.45	0.53	0.60	0.68	0.75
0.2	0.23	0.25	0.30	0.35	0.40	0.45	0.50
0.1	0.11	0.13	0.15	0.18	0.20	0.23	0.25

Table to indicate the surface intensity (W/cm^2) required to achieve a particular intensity at depth using 1MHz ultrasound