

**TABLE 2 - Areas of damage associated with emotion regulatory deficits
(derived from J, Gross, Handbook of Emotion Regulation)**

Emotion regulation deficit

Area of damage

Citations

Motivation toward reward and away from punishment

1. Lack of knowledge of social rewards

Temporal lobe, OFC, DIPFS

Anderson et al. (1999), Barrash (2000), Blair & Cipoletti (2000), Cicerone & Tanenbaum (1997)

2. Impaired filtering of emotional information

OFC

Rule, Shinamura & Knight (2002)

3. Failure to maximize positive emotion

OFC

Rahman et al. (2001), Stanfey et al. (2003), Shiv, Lowenstein & Bechara (2005)

4. Impaired reversed learning

OFC

Bechara et al. (1999), Fellows & Farah (2005a), Rolls et al., (1994)

5. Failure to accomplish goals

DIFPC, OFC

Goel et al. (1997), Gomez-Belderrai et al. (2004), Saver & Damasio (1991), Shallice & Burgess (1991)

6. Impaired response to anticipated startle

OFC

Roberts et al. (2004)

Manipulating magnitude of response

7. Aberrant sexual behaviors

Temporal lobe, amygdala, OFC

Ghika-Schmid (1995), Hayman (1999), Pradhan (1998), Yoneaka (2004)

8. Increased rage, violence, explosive temper, aggression, hostility, anger, irritability, irreverence, lability

Temporal lobe, amygdala, caudate, ACC, OFC

Barrash (2004), Cicerone (1997), Grafman (1996), Jha (2004), Tateno (2004)

9. Increased anxiety

OFC, PFC

Grafman et al. (1986), Paradiso (1999), Tateno (2004)

10. Increased pride

OFC

Grafman (1986), Paradiso (1999), Tateno (2004)

11. Impulsiveness

VMPFC

Bechara (2002), Berlin (2004), Sanfey (2003)

12. Change in subjective emotional experience

OFC, ACC

Hornak (2003)

13. Placidity, passivity, apathy

Temporal lobe, amygdala, caudate, ACC, OFC, lateral PFC

Barrash (2000), Hayman (1998), Lilly (1983), Paradiso (1999), Pradhan (1998), Pandey (1998),

Yoneoka (2004)

14. Depression, less happiness

OFC, DIPFC

Berlin (2004), Grafman (1986), Paradiso (1999), Tateno (2004)

15. Blunted affect

Temporal lobe, OFC, DIPFC

Barrash, Tranel (2000), Grafman (1986), Pradhan (1998)

16. Loss/reduction of anger or fear

Temporal lobe, amygdala, thalamus, ACC, OFC

Cohen (2001), Sprengelmeyer (1999), Yoneika (2004)

17. Lack of embarrassment

OFC

Beer (2003)

Producing facial expressions

18. Impaired reflexive smiling

Cortimotor strip, corticobullar connections

Rinn (1984)

19. Inappropriate crying or laughing

OFC, lateral PFC, caudate, temporal lobe

Max (2001), Tateno (2004)

20. Impaired posed facial expressions

Extrapyrmidal system (basal ganglia)

Rinn (1984)

