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Complex made Simple...clinically relevant education by Judy C. Colditz, OT/L, CHT, FAOTA

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ClinicalPearls

No. 18

TENDON OUTCOME ASSESSMENTS

Until recently, recommended assessment methods for tendon repair outcomes have focused solely on active range of motion. More flexor tendon assessment methods have been suggested than extensor tendon methods even though the number of extensor tendon zones is greater. Since 1950 there have been more than 20 different recommended assessment methods for flexor tendons. Below the most common methods are briefly described.

FLEXOR TENDONS

The most frequently referenced method is Total Active Motion (TAM) as described by the American Society for Surgery of the Hand (ASSH)[1][sum of the degrees of active MP, PIP and DIP joint flexion less the degrees from full extension.] ASSH recommends that the contralateral finger (if uninjured) is used as the normal although they also publish 260 degrees as the TAM norm for these three joints. The TAM of the injured finger is divided by the norm (either contralateral total or 260 degrees) and the result is the percentage of normal. ASSH categories the percentages as:

EXCELLENT	**100%**
GOOD	**>75%**
FAIR	**>50%**
POOR	**<50%**

ZONE 2

With challenging outcomes seen in zone 2 flexor injuries and the fact that MP joint movement does not create glide within zone 2, Strickland & Glogovac[2] suggested that the TAM measurements for this zone only include the PIP & DIP joints and modified the category percentages:

EXCELLENT	**85-100%**
GOOD	**70-84%**
FAIR	**50-69%**
POOR	**<50%**

(Strickland[3] later revised the scoring scale but many feel it was too lenient and it is not used as widely as the original scale.)

Buck-Gramcko in Germany[4] has suggested a more complex scoring method which results in total points which are described as excellent, very good, good, fair, or poor. This system is used more frequently in Europe than in the US.

In 2006 Tang[5] devised a scoring system including grip strength and motion quality as well as percentage of normal motion. These three factors are combined to provide a "function grade."

ZONE 1

Moieman & Elliot[6] suggested the TAM system be used for zone 1 injuries but only the DIP joint be measured, identifying the TAM of the DIP joint as 74 degrees. The scale they recommend is identical to the Strickland & Glogovac above although the percentage only represents one joint.

ZONES 3, 4 & 5

The TAM method is recommended for these zones along with isolation of FDS glide.

EXTENSOR TENDONS

Fewer assessment techniques are recommended for extensors. TAM is most widely recommended, although some reference Miller's method (1942)[7] where active lag and loss of terminal flexion are both given scores.

continued...

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RELEVANT QUESTIONS

Although we think hand therapy and hand surgery has evolved, I am always struck by how far we have yet to go to be able to accurately compare our results.

When should we complete the final evaluation?

Currently there is no standard as to when the final assessment should be made. In studies reviewed those who reported interim measurements always demonstrated that early outcomes are always less than final measurements.

What is normal?

Should we use the suggested norms of 260˚ for TAM of the finger? Doesn't the more accurate measurement of the TAM of the individual's contralateral finger reflect that patient's normal?

Where's the wrist?

None of the recommended evaluation methods consider the excursion required across the wrist for the extrinsic tendon repair to be fully functional. One could have very limited concurrent wrist and finger motion and still score an excellent percentage based only on finger motion!

THE FUTURE

For me it is challenging to remember what "good" (for example) really represents. As MacDermid[8] has suggested, perhaps we should eliminate descriptive terms and simply describe the motion outcome as the percentage of the normal contralateral finger. Isn't 75% of normal motion much easier to visualize than "good" motion?

This review has urged me to think of how we could devise better tendon assessments in hand therapy and hand surgery. I would encourage someone to investigate how we can include extrinsic and/or intrinsic muscle tightness as part of the assessment and how we can correlate dexterity, strength, & function with the ROM measurements.

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